THE UNIVERSITY *of* EDINBURGH

Edinburgh Research Explorer

Arguments and Adjuncts

Citation for published version:
Ackema, P 2015, Arguments and Adjuncts. in T Kiss & A Alexiadou (eds), Syntax – Theory and Analysis: An International Handbook. vol. 1, Handbücher zur Sprach- und Kommunikationswissenschaft / Handbooks of Linguistics and Communication Science (HSK), no. 1, vol. 42, De Gruyter Mouton, Berlin, pp. 246-273.

Link:
[Link to publication record in Edinburgh Research Explorer](#)

Document Version:
Publisher's PDF, also known as Version of record

Published In:
Syntax – Theory and Analysis

Publisher Rights Statement:
© Ackema, P. (2015). Arguments and Adjuncts. In T. Kiss, & A. Alexiadou (Eds.), Syntax – Theory and Analysis: An International Handbook. (Vol. 1, pp. 246-273). (Handbücher zur Sprach- und Kommunikationswissenschaft / Handbooks of Linguistics and Communication Science (HSK); Vol. 42, No. 1). Berlin: De Gruyter Mouton.

OPEN ACCESS

Van Valin, Robert D., and Randy LaPolla
  1997   *Syntax. Structure, Meaning and Function.* Cambridge: Cambridge University Press.
Woolford, Ellen
  2001   Case patterns. In: Géraldine Legendre, Jane Grimshaw, and Sten Vikner (eds.), *Optimality-Theoretic Syntax*, 509−543. Cambridge/Mass: MIT Press.
Woolford, Ellen
  2003   Burzio's Generalization, markedness, and constraints on nominative objects. In: Ellen Brandner, and Heike Zinsmeister (eds.), *New Perspectives on Case Theory*, 301−329. Stanford: CSLI Publications.
Wunderlich, Dieter
  2003   Optimal case patterns. German and Icelandic compared. In: Ellen Brandner, and Heike Zinsmeister (eds.), *New Perspectives on Case Theory*, 329−365. Stanford: CSLI Publications.

Beatrice Primus, Cologne (Germany)

9. Arguments and Adjuncts

Abstract

In this chapter it is outlined how the notions of argument and adjunct are used in syntax, and why it is considered useful to distinguish the two. First, arguments will be introduced. The distinction between syntactic arguments and semantic arguments will be outlined, as well as the possible relationships between the two. Then modifiers are introduced, and it is shown that the problem of how to integrate these into syntactic structure can lead to the notion of a syntactic adjunct. Finally, the various syntactic differences between arguments and adjuncts that have been claimed to exist are examined.

1.   Arguments

1.1. The semantic notion of argument

The notion of argument as used in linguistics has both a semantic and a syntactic meaning. The two are intimately connected, as we will see, and it will be helpful to the understanding of the syntactic notion to first introduce the semantic notion.

The semantic notion of argument could be described as a participant in the event/ state/relation expressed by a predicate. Predicates can be sub-divided according to how many arguments they take, their semantic valency. Thus, verbs like *laugh* or *blush* in (1)−(2) express one-place predicates (predicates taking one argument), in (3)−(4) we are dealing with two-place predicates and the verbs in (5)−(6) express three-place predicates. The elements expressing a semantic argument are between brackets.

(1)   *[Mary] laughs.*

(2)   *[James] blushed.*

(3)   *[John] is reading [the paper].*

(4)   *[Harriet] knows [the answer].*

(5)   *[John] sold [me] [a copy].*

(6)   *[The author] sent [his publisher] [the manuscript].*

Predicates taking more than three arguments are rare at best, but the verb *to bet* has been cited as taking four arguments:

(7)   *[I] bet [you] [ten dollar] [that they will win].*

Of course, it depends on a rather more precise analysis of what a semantic argument is than saying it is a participant in the event or state expressed by the predicate to determine whether all four participants in (7) are proper arguments, but such an analysis will not be undertaken here (see Jackendoff 1990a, for instance, for extensive discussion).

From (1)−(7) it might be inferred that predicates are always expressed by means of a verb, here by forms of *laugh*, *blush*, *read*, *know*, *sell*, *send* and *bet*. However, predicates can also be expressed by other lexical categories. Thus, in (8)−(10) the predicate is expressed by an adjective, a noun, and a preposition, respectively.

(8)   *[John] is **ill**.*

(9)   *[Carla] is **a doctor**.*

(10)   *[Simon] is **in** [the house].*

Semantic arguments can be classified in terms of their semantic content (indicating the way in which they participate in the event/state/relation). Thus, at least the following types of argument are often distinguished:

(11)   a.   Agent: the "doer" of the action, the causer of the event.
             John *kicked the ball;* ***Mary*** *laughed;* ***The key*** *opened the door*

        b.   Theme: the thing undergoing the action, the thing in motion, the causee
             *John kicked **the ball**; Mary read **the paper**; The key opened **the door***

        c.   Goal: the thing towards which the action is directed
             *He sold **me** a copy; She gave **her brother** a present*

  d. Experiencer: a sentient being that is mentally affected by the action/state:
    *Mary fears dogs; Dogs frighten **Mary**; The outcome pleased **me***

  e. Benefactives: the person/thing that benefits from the action:
    *I baked **John** a cake*

Exactly which argument types should be distinguished is a matter of debate, and again depends on a more precise analysis of the notion of semantic argument; see Grimshaw (1990), Jackendoff (1990a), Hale and Keyser (1993), Reinhart (2002), inter alia.

1.2. Syntactic arguments and their relationship with semantic arguments

As noted, the notion of argument introduced in section 1.1 is a semantic notion. There is a related, but distinct, syntactic notion of argument. It can be observed that certain verbs go together with just a subject (intransitive verbs), some go together with both a subject and a direct object (transitive verbs) and some take a subject, a direct object and an indirect object (ditransitive verbs), as illustrated in (12)−(14).

(12) a. *Mary laughed.*
   b. **Mary laughed Bill.*
   c. **Mary laughed Bill a funny book.*

(13) a. **Mary destroyed.*
   b. *Mary destroyed the book.*
   c. **Mary destroyed Bill the book.*

(14) a. **Mary gave.*
   b. *Mary gave a book.*
   c. *Mary gave Bill a book.*

The syntactic constituents that appear in the subject, direct object, and indirect object positions are the syntactic arguments of the verb, to be distinguished from the semantic arguments as discussed before. Thus, the syntactic valency of a verb is the property that determines how many syntactic arguments the verb takes, as opposed to the semantic valency of a predicate, which says how many semantic arguments the predicate takes.

  The number of syntactic arguments a verb (or other lexical category expressing a predicate) can take is determined by the number of semantic arguments that the predicate expressed by the verb takes. Considering the predicates in (1)−(6) above, for example, it is clear that the one-place predicates in (1)−(2) are expressed by intransitive verbs, the two-place predicates in (3)−(4) are expressed by transitives, and the three-place predicates in (5)−(6) are expressed by ditransitives.

  Nevertheless, the number of semantic arguments a predicate takes cannot simply be equated with the number of syntactic arguments that the verb which expresses that predicate appears with syntactically. This is already apparent from the example in (14b) above. Next to the case of (14c), where it appears with three syntactic arguments, the verb *give* can also appear with just two syntactic arguments. In (14b), the semantic Goal argument is left syntactically unexpressed. It is still part of the meaning of *give* (it is still implicit

in 14b that there is a person or entity to whom Mary gave a book), but there is no syntactic constituent expressing it. It is an implicit argument in this case. (It is of course possible that an implicit argument is present syntactically as an empty category. There are reasons to believe, however, that this is not the case for implicit indirect objects in English as in 14b, see Rizzi 1986.) It is in fact a rather typical property of Goal arguments that they need not be expressed syntactically:

(15) a. *He sent me a letter.*
     b. *He sends lots of letters.*

(16) a. *They sold us a lot of books.*
     b. *They sold a lot of books last year.*

In many cases, the Theme argument of a transitive verb can also be left unexpressed:

(17) a. *Leo was eating Brussels sprouts.*
     b. *Leo was eating.*

(18) a. *Heather was reading the paper.*
     b. *Heather was reading.*

(19) a. *David is painting the shed.*
     b. *David is painting.*

In contrast, (20) shows that in the usual case (and see below on deviations from the usual case) an Agent argument cannot be left unexpressed in a full, finite, clause in English. This might not have anything to do with their being Agents as such, but be a consequence of the fact that (overt) subjects are obligatory in English finite clauses, in combination with the canonical correspondence rule for Agent arguments mentioned in (25) below. After all, the Experiencer subject of a verb like *fear* cannot be left implicit either, as shown in (21). (However, see immediately below on the possibility of satisfying the subject requirement of languages like English by using an expletive; this would not improve the sentences in 20−21 though).

(20) a. **Was eating Brussels sprouts.*   (except in topic drop/diary drop registers)
     b. **Was reading.*
     c. **Is painting.*

(21) **Fears dogs.*

The opposite of the situation in which a semantic argument does not seem to correspond to any syntactic argument, so a situation in which a syntactic argument does not correspond to any semantic argument, occurs as well. There can be elements that appear in a syntactic argument position that do not correspond to a semantic argument and are in fact meaningless. Clear examples of this arise in languages in which finite clauses contain a particular structural subject position that must always be filled (non-pro-drop languages). In some contexts, the semantic subject can occur in a position lower than this structural subject position, whereas in other cases there may be no semantic subject present in syntax at all. In these cases, an expletive fills up the syntactic subject position, so we have an element in an argument position that does not correspond to a semantic argu-

ment. Examples are given in (22) (22c is an example of an impersonal passive in Dutch, that is, a passive from an intransitive verb). The expletive subjects are in boldface.

(22) a. **There** *were a lot of mistakes in the essay.*
      b. **It** *seems that the weather is going to improve over the weekend.*
      c. **Er**   *werd de hele   avond gedanst.*   [Dutch]
          there was the whole night danced
          'People danced the whole night long.'

So, the semantic valency of a predicate does not determine exactly how many / which syntactic arguments the category expressing the predicate appears with. The semantics of the predicate also does not determine the type of lexical categories that can realise the syntactic arguments that do occur. Predicates that are semantically very similar can impose different selectional restrictions on their syntactic arguments in this respect, see for instance Grimshaw (1979), Gazdar et al. (1985: 32), and Jackendoff (1993). However, the semantic valency of a predicate does determine the maximum number of syntactic arguments that the category expressing the predicate can appear with.

The influence of the semantic valency of a predicate on the structure of sentences in which the predicate occurs goes further than that however, at least in a language like English. Consider the examples in (23)−(24).

(23) a. *Mary saw Bill.*
      b. *Bill saw Mary.*

(24) a. *The fox sold the bear the wolf.*
      b. *The bear sold the wolf the fox.*
      c. *The wolf sold the fox the bear.*

In both (23a) and (23b) there are two arguments, in accordance with the fact that the verb *see* expresses a two-place predicate. But not only do we know that *Mary* and *Bill* express the arguments of this predicate, we also know for sure which syntactic argument expresses which semantic argument. In (23a) *Mary* is necessarily interpreted as the Agent and *Bill* as the Theme, while in (23b) this is the other way around. Similar considerations hold for the sentences with ditransitive *sell* in (24). We know exactly what the distribution of Agent, Theme and Goal roles across the three syntactic arguments is in these sentences. Apparently, there are systematic correspondences between semantic arguments and syntactic arguments. Examples (23) and (24) illustrate the basic correspondences in (25). Possible deviations from these are discussed in section 1.4.

(25) Agent   ↔   Subject
      Theme   ↔   Direct object
      Goal   ↔   Indirect object

It has been proposed (for example, by Marantz 1984) that there are languages that are fundamentally different in this respect. Such "syntactically ergative" (Dixon 1972) languages would have the correspondence rules in (26). (In contrast, morphologically ergative languages do not deviate from 25 − see for instance Bobaljik 1993 − but have a

pattern of morphological case marking such that subjects of intransitives are assigned the same case as objects of transitives, while subjects of transitives receive a different case.)

(26) Agent   ↔   Direct object
      Theme   ↔   Subject

Subsequent research has cast doubt on the existence of such languages, however, as it seems the phenomena that were taken to show that Themes occupy a structurally higher (subject) position than Agents (in object position) really relate to the notion of topic rather than structural subject (see Van de Visser 2006: 40−52 and references cited there).

   A different matter is that the syntax of a language can allow for a lot more variability in word order than what is possible in English. A language can adhere to (25) while allowing various kinds of syntactic re-positionings of the subject and the objects in its surface word order. Good examples are discourse-configurational languages such as Hungarian and Finnish (see for instance Kiss 1995). Other languages may lack structural syntactic subject and object positions altogether, and express their arguments morphologically rather than syntactically (polysynthetic languages, see for example Hale 1983; Jelinek 1984, 2006; Baker 1996).

1.3. How arguments are integrated into the syntactic structure

There is some evidence that the positions in which the syntactic arguments of a verb occur are not all equal, in the sense that they are not all in the same syntactic relationship to the verb. There seems to be a hierarchy of syntactic argument positions, with the direct object position being closest to the verb, so lowest in the syntactic structure of the sentence, and the subject position furthest away from the verb, so highest in the syntactic structure. (As noted at the end of the previous section, this relates to the underlying positions of the arguments, not to their possible surface positions in all sentence types, and it may not hold at all in polysynthetic languages.) At least in a language like English, in a sentence headed by a transitive verb, the direct object and the verb seem to form a constituent that excludes the subject. Evidence for this includes the following.

   First, verb and direct object together can be replaced by an instance of *do so* in English, to the exclusion of the subject, as in (27a). The subject can never be included in *do so* substitution, whether or not the object is included, as illustrated by (27b−c).

(27) a. *Mary **plays the guitar** and Deborah **does so**, too.*
      b. **Mary plays** *the guitar and* **does so** *the trombone, too.*
      c. *On Fridays **Mary plays the guitar** and when she has time on any other day* **does so,** *too.*

The possibility of replacing a string of words in a sentence by a single pro-form, such as *do so*, is an indication that that string forms a constituent of the sentence. Thus, (27) shows that verb and direct object form a constituent to the exclusion of the subject.

   This is also shown by the fact that verb and direct object together can be put in a different position in the sentence. In particular, they can be put in first position (topical-

ized), as in the second of the two conjoined sentences in (28a). The subject is necessarily excluded from such topicalization, whether or not the direct object is included in it, as (28b-c) show.

(28) a. *Mary said she would play the guitar on Friday, and play the guitar she did.*
      b. **Mary said she would play the guitar on Friday, and Mary play did the guitar.*
      c. **Mary said she would play the guitar on Friday, and Mary play the guitar did indeed on Friday.*

If a string as a whole can undergo such displacement and be put in a different position in the sentence, then this, too, indicates that that string is a constituent. Again, then, we see that the verb plus its direct object argument appear to form a constituent to the exclusion of the subject argument.

   The structure of phrases headed by a verb that takes a subject argument and a direct object argument can be represented as in (29) then. (In 29 "traditional" X-bar phrase structural notation is used, see Chomsky 1970 and Jackendoff 1977. There are, of course, other theories of phrase structure which make somewhat different assumptions, such as the bare phrase structure theory proposed in Chomsky 1995. The main point here, however, is that, in languages that are not polysynthetic, the syntactic arguments have a basic position in the sentence that is particular to them and that these positions stand in a particular hierarchical relationship to each other, such that the subject argument is higher in the structure than the direct object argument: the direct object forms a unit with the verb that excludes the subject. This point is not affected by the exact details of the phrase structure theory that is adopted.)

(29)   Verb Phrase
          /   \
      subject   V'
                     /   \
                    V   object
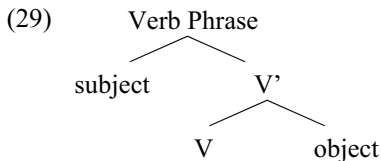
Exactly the same can be argued for Noun Phrases, as is especially clear for those NPs that are headed by a deverbal noun. Consider for example a noun like *collection*. This noun seems to combine with the same two arguments that the verb *collect* combines with, and, importantly, it seems to do so in the same way. Thus, the Theme argument appears in the complement position and the Agent argument in the specifier position in an NP like *Mary's collection of mushrooms* in (30).

(30)   Noun Phrase
          /   \
      Mary's   N'
                     /   \
                    N   *of mushrooms*
                collection
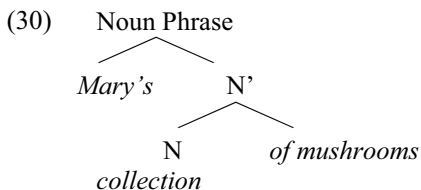
That in NPs, as in VPs, the head and the complement do indeed form a constituent (the N' in 30) that excludes the specifier can again be shown by a replacement test: a noun

and its complement can be replaced by the pronoun *one*, as in (31a). Whereas the complement, if present, must be included in such *one*-replacement, as (31b) demonstrates, the specifier cannot be included in *one*-substitution, regardless of whether the complement is included or not, as shown by (31c−d).

(31) a. *Mary's **collection of coins** is not as good as Jane's **one***.
      b. **Mary's **collection** of coins and Jane's **one** of stamps*.
      c. ****Mary's collection** of coins is interesting and **one** of stamps is expensive.*
      d. ****Mary's collection of coins** is interesting and **one** is also expensive.*

The structure in (29) has a position for one object only, the direct object. What about the position of indirect objects in structures headed by a ditransitive verb? Although this is a matter of quite some debate, there seem to be some indications that, in such structures, the indirect object occupies a position that is hierarchically in between the position of the subject and the position of the direct object. One such indication is based on binding data. In a sentence like (32), where the meaning of the pronoun *her* is determined by the quantified expression *every girl*, in the sense that the reference of the pronoun ranges over the same set of individuals that the quantifier picks out, the quantifier binds the pronoun. (The sentence has a second reading as well, in which *her* refers to some, contextually determined, single individual, but this reading is not relevant here).

(32) *Every girl loves her mother.*

In a binding relation the antecedent must c-command the pronoun it binds. Thus, pronouns inside direct objects can be bound by the subject, as in (32) above, but pronouns inside the subject cannot be bound by the direct object, as (33) illustrates. (On the assumption that the quantified object undergoes covert Quantifier Raising, this would be a case of a Weak Crossover violation, on a par with cases that show that objects that overtly A'-move across a subject can still not bind a pronoun inside that subject: **who$_i$ does his$_i$ mother love*. On Weak Crossover, see for instance Postal 1971, 1993; Lasnik and Stowell 1991; Ruys 2000).
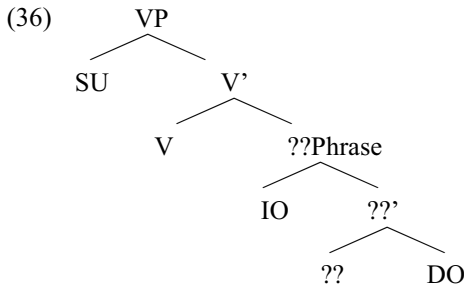
(33) **Her mother loves every girl.*

If so, the fact that pronouns inside a direct object can be bound by an indirect object (as in 34a), whereas pronouns inside an indirect object cannot be bound by a direct object (as in 34b), indicates that indirect objects occupy an argument position that is higher than that of direct objects.

(34) a. *Santa Claus gave every girl her present.*
   b. **The organisers gave its rightful winner every price.*

By the same token, (35) shows that, like direct objects, indirect objects occur lower than the subject:

(35) a. *Every girl gave her mother a present.*
      b. **Her mother gave every girl a present.*

Given that the order we see the arguments appear in is Subject (SU) − Indirect Object (IO) − Direct Object (DO) in English, these data would suggest that ditransitive verbs occur in a structure like (36). (When the indirect object is introduced by a preposition, it follows, rather than precedes, the direct object: *John gave a book to Mary / *John gave to Mary a book*. On this dative alternation, see for instance Larson 1988; Jackendoff 1990b; Den Dikken 1995; Pesetsky 1995; Neeleman and Weerman 1999.)

(36)

```
            VP
          /    \
        SU      V'
              /    \
             V    ??Phrase
                   /    \
                  IO    ??'
                       /    \
                      ??     DO
```

The question then is what kind of constituent the ??Phrase in (36) is. Various proposals for this have been put forward in the literature. Larson (1988), for example, proposed that what is labeled ??Phrase in (36) is actually the VP, whereas what is labelled VP in (36) is a second, higher, layer of the VP (a VP-shell). Chomsky (1995) suggests that this higher layer is actually the projection of a distinct verbal head, which he terms *v* (as opposed to V) that is specifically responsible for the introduction of the subject argument. For critical discussion and an alternative view, assuming that VPs can have a flatter structure than indicated in (36), see Jackendoff (1990b) and Culicover and Jackendoff (2005). Note that the same problem does not arise in OV languages in which the binding data and linear order between IO and DO are the same as in the VO language English, as we can simply add another argument position for the IO in the VP here, as in (37). See Neeleman and Weerman (1999) for extensive discussion of the differences between VO and OV languages in this respect.

(37)

```
            VP
          /    \
        SU      V''
              /    \
             IO     V'
                   /    \
                  DO     V
```
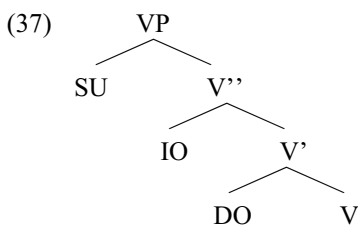
1.4. Manipulating argument structure

If the correspondences between semantic arguments and syntactic arguments given in (25) above always held, it would be possible to equate syntactic arguments with semantic arguments. But as already mentioned in section 1.2, this neat 1-to-1 correspondence does not always hold: a semantic argument need not always correspond to any syntactic argu-

ment (and vice versa). A semantic argument can sometimes be left syntactically unexpressed. There are other ways in which deviations from (25) can arise as well. The grammar of a language can provide various ways of manipulating the correspondences between semantic and syntactic arguments, so that semantic arguments can come to be associated with different syntactic arguments. Such grammatical processes, which seem to manipulate the so-called argument structure of a verb, include the ones listed in A−F below.

Before we discuss these processes, it is important to note that they genuinely affect the way in which semantic arguments are expressed by syntactic arguments. As noted before, a different matter is that syntactic arguments can sometimes occur in positions other than their usual one because the grammar can demand that constituents with a particular form or discourse function must occur in a special position in the sentence. Consider for example questions in English. Regardless of whether the questioned phrase is a subject, a direct object or an indirect object (or anything else), it must undergo wh-movement and thus come first in the sentence (*who gave Jill that book? / whom did Mary give that book? / what did Mary give Jill?*). Apparently, the grammar of English (in contrast to the grammar of a wh-in-situ language such as Japanese) specifies that questioned phrases must undergo wh-movement. But there is a crucial difference between what happens in cases of wh-movement and what happens in the processes mentioned in A−F below. When, say, a direct object that expresses a Theme argument is questioned, it does not as a result of that become the subject of the sentence; nor is another argument suppressed that is not suppressed in the non-question counterpart of the sentence. Compare *Jill read the book* and *what did Jill read*: just like in the former, in the latter the Agent argument is still the subject, and the Theme argument is still the direct object, even though it occurs in the position for wh-phrases rather than in the usual direct object position. This is very different, though, in passives for example (process A below): in a passive, the Agent argument no longer appears as the subject, and the Theme argument becomes the subject of the sentence (as witnessed by its ability to control the agreement on the finite verb, for example). This distinction is extensively discussed in the (vast) literature on A-movement versus A'-movement. Having said this, let us now consider the various argument structure alternations that one can encounter.

A. Passivization. This has the effect that the Theme (or whichever argument is the direct object argument in the active) becomes the subject, and the Agent (or whichever argument is the subject argument in the active) need not be expressed syntactically anymore (although it can optionally appear in a *by*-phrase), as illustrated in (38) and (39). There is a large literature on passives; see for example Chomsky (1981), Siewierska (1984), Jaeggli (1986), Postal (1986) and Baker et al. (1989).

(38) a. active: *Flora has fed the tigers.*
      b. passive: *The tigers have been fed (by Flora).*

(39) a. active: *The Romans destroyed the city.*
      b. passive: *The city was destroyed (by the Romans).*

B. Middle formation. A so-called middle resembles a passive in that the Theme argument corresponds to the subject. In contrast to a passive, however, the Agent argument cannot be expressed optionally through a *by*-phrase in a middle. Passives and middles

also differ in their meaning, in that passives can express an event, while middles typically express a property of their subject (i.e. the Theme argument). Moreover, middles can distinguish themselves from passives formally as well (although in some languages they are formally identical to passives). In English, for example, middle formation does not express itself morphologically at all. Instead, the verb keeps the same form as in an active sentence. (This is why the term middle is used for such sentences: they are in between active and passive sentences in that formally they look like actives, but in their distribution of semantic arguments across syntactic constituents they are more like passives). Some examples of middles in English are given in (40b) and (41b). For discussion, see Fagan (1988, 1992), Stroik (1992), Ackema and Schoorlemmer (1994, 1995) and Steinbach (2002).

(40) a. active*: Barry read this book.*
      b. middle: *This book reads well.*

(41) a. active: *The mafia bribed the bureaucrats.*
      b. middle: *Bureaucrats bribe easily.*

C. The causative-inchoative alternation. Some causative verbs (verbs that have a subject argument that expresses the causer of the event or state) allow their Theme argument to become the subject. The Agent/Cause argument seems to disappear altogether in that case, even semantically. The version of the verb which has the Theme as its subject is called an inchoative verb, which means that the verb expresses a change of state of this argument. Relevant discussion can be found in Levin and Rappaport Hovav (1994), Reinhart (2002) and Schäfer (2009).

(42) a. causative: *Zoilo opened the door.*
      b. inchoative: *The door opened.*   (no Agent implied − the door opened "by itself")

(43) a. causative: *The sun ripened the tomatoes.*
      b. inchoative: *The tomatoes ripened.*   (no Agent implied − the tomatoes ripened "by themselves")

D. Reflexivization. The Theme argument of some verbs that are otherwise obligatorily transitive can remain syntactically unexpressed if this argument refers to the same entity as the Agent argument, as in (44). This phenomenon is discussed in Marantz (1984), Grimshaw (1990), Reinhart and Reuland (1993), Pesetsky (1995) and Reinhart and Siloni (2005).

(44) a. *John dresses.*   (can only mean John dresses himself)
      b. *Mary washes.*   (can only mean Mary washes herself)

The operations in A−D above all occur in English, as the examples illustrate. Many languages have the same or similar operations, although probably none of these processes is universal. Languages that do not have passives, for instance, include Tongan, Samoan and Hungarian (Siewierska 1984). On the other hand, languages can also have yet other ways of manipulating a verb's argument structure. Two such processes are the ones in E−F.

E. Applicative. In an applicative, a phrase that is not usually an argument of the verb, but for instance an instrumental modifier (see section 2 on modifiers), becomes the direct object of the verb. An example from the Bantu language Chingoni is given in (45), from Ngonyani and Githinji (2006) (FV in the gloss stands for final vowel); note the applicative morpheme *-il* carried by the verb. Various tests show that phrases like *chipula* 'knife' in (45) indeed function as an object rather than an instrumental modifier. For example, such phrases can in turn become the subject of the sentence if the applicative sentence is passivised (compare section 3 on why this presumably indicates the phrase is an argument rather than a modifier). For discussion, see Baker (1985, 1988a, b), Mchombo (1993), Alsina and Mchombo (1993), Hyman (2003).

(45) *Mi-jokwani v-i-dumul-il-a   chi-pula.*   [Chingoni]
        4-sugarcane 2SBJ-PRS-cut-APPL-FV 7-knife
        'They use the knife to cut the sugar cane with.'

The closest thing in English to an applicative is the so-called spray/load alternation (see for instance Levin and Rappaport Hovav 1994). Verbs such as *spray* and *load* can have their Theme as object argument, in line with (25). But, as the (b) sentences in (46) and (47) show, the element expressing Location can also seemingly occur as object argument with these verbs, resembling the promotion to argument status of such modifiers in applicatives.

(46) a. *They sprayed paint on the wall.*
        b. *They sprayed the wall with paint.*

(47) a. *They loaded hay onto the wagon.*
        b. *They loaded the wagon with hay.*

The last process affecting argument structure to be mentioned does not involve promotion of any argument or modifier but rather the opposite. This is the following.

F. Anti-passive. In this process, the direct object of a verb gets demoted, and is either not expressed at all anymore, or at best as a phrase that carries case morphology that is typical of modifiers (cf. section 2) rather than arguments. Polinsky (2005) provides an overview of this construction. The Chukchi examples in (48) illustrate the alternation between an ordinary transitive sentence and an anti-passive (examples from Kozinsky et al. 1988: 652, cited here from Polinsky 2005; AOR in the gloss stands for aorist). Note that the ergative-absolutive case marking pattern in (48a) indicates that this a transitive sentence in which *kimitʔən* 'load' (the absolutive argument) is the direct object, whereas the absolutive-instrumental case pattern in (48b) indicates that this an intransitive sentence in which *kimitʔ-e* 'load' (with Instrumental case) acts as a modifier. The same is indicated by the presence versus absence of object agreement on the verb. Further discussion of anti-passives can be found in Marantz (1984), Johns (1987), Baker (1988a) and Bok-Bennema (1991).

(48) a. *Ɂaaček-a   kimitɁ-ən ne-nlɁetet-ən.*   [Chukchi]
        youth-ERG load-ABS 3PL.SBJ-carry-AOR.3SG.OBJ
        'The young men carried away the/a load.'

b. *ʔaaček-ət ine-nlʔetet-gʔe-t kimitʔ-e.*
   youth-ABS ANTIP-carry-AOR.3SG.SBJ-PL load-INS
   'The young men carried away the/a load.'

This concludes the overview of processes that appear to change the way a predicate's semantic arguments are syntactically realized. Another question is how to analyze such processes. Roughly speaking, two approaches can be distinguished, which could be called the lexical approach and the syntactic approach.

The lexical approach assumes that the lexicon does not only contain entries for verbs (and other predicative elements) that specify their basic argument structure, but also a set of operations or principles that can manipulate this argument structure. Thus, Williams (1981) proposed there are rules like Externalise(X) and Internalise(X) where X is some designated argument of the predicate. Ackema and Schoorlemmer (1994) and Bouchard (1995) propose that when what is normally the subject argument of a predicate is not realized syntactically, the next highest argument, as determined by a particular argument hierarchy, can receive that status. For discussion see also Aranovich and Runner (2000), Spencer and Sadler (1998), Reinhart (2002), Reinhart and Siloni (2005).

According to the syntactic approach, lexical manipulation of argument structure is not possible, so the semantic arguments always correspond to syntactic arguments in exactly the same way initially (this is the tenet of Baker's 1988a Uniformity of Theta Assignment Hypothesis). Argument promotion or demotion processes such as the ones mentioned above are then considered to be the result of syntactic operations that can put constituents in a different argument position, in combination with the assumption that syntactic arguments can sometimes be realised by empty elements. See for instance Baker (1988a), Baker et al. (1989), Stroik (1992), Hoekstra and Roberts (1993).

How best to analyze a particular process depends on issues that we cannot go into in this chapter, such as the proper nature of unaccusativity (cf. Levin and Rappaport Hovav 1994; Alexiadou et al. 2003), as well as on the perceived similarities and differences between the various processes. It is conceivable that not all argument structure changing processes should be analysed in the same way. Possibly, some are the result of lexical rules on argument structure, whereas others are the result of A-movement in syntax. For example, Ackema and Schoorlemmer (1994, 1995) try to show that at least in Dutch middles are unlike passives in showing no signs of their surface subject having undergone A-movement from object position (middle verbs in Dutch behave on a par with unergatives rather than unaccusatives), so for them a lexical treatment is required. They also note that middles in some other languages seem to behave more like passives in this respect, and so might be better analysed as involving syntactic A-movement (see also Authier and Reed 1996). Detailed accounts involving such a lexical versus syntactic cross-linguistic split in middle constructions can be found in Lekakou (2004) and Marelj (2004) (for a general overview see also Ackema and Schoorlemmer 2005). Reinhart (2002) and Reinhart and Siloni (2005) propose to extend such an approach to other processes affecting argument structure as well, in particular to reflexivization. Thus, they propose the following general parameter (where thematic arity more or less corresponds to what is termed argument structure here):

(49) The lex-syn parameter
      Universal Grammar allows thematic arity operations to apply in the lexicon or in the syntax.

It is probably fair to say, though, that there is no general consensus as to what the optimal overall approach to such processes is.

2. Adjuncts

In section 1, semantic arguments were introduced as participants in the event or state expressed by the predicate, and syntactic arguments as constituents expressing those. Sentences can contain more elements than the predicate and its arguments, however. In particular, they can contain constituents that provide all sorts of additional information about the event/state: where it occurred, when it occurred, the reason why it occurred, the manner in which it took place, what the emotional state of the participants was, and so on. Such information is expressed by so-called modifiers. Examples of modifiers are the phrases in boldface in (50).

(50) a. *Gerald bought a cd **in the megastore**.*
      b. *Gerald bought a cd **before noon**.*
      c. *Gerald bought a cd **without realizing he already had it**.*
      d. *Gerald **quickly** bought a cd.*
      e. *Gerald bought a cd **to impress his friends**.*
      f. ***Eager to fill this gap in his enormous collection**, Gerald bought a cd.*

The notion modifier is really a semantic notion: whereas a semantic argument is a participant in an event or state, a semantic modifier modifies the event or state in the sense that it provides some additional information about it that distinguishes this event/state from other events/states of a similar type. (Of course, much more can be said about the semantics of the relation between modifiers and predicates than the rough description just given; see chapter 37 in this volume for a thorough discussion). As such, this semantics does not tell us anything about the syntactic status of the phrases that express modifiers, such as the phrases in boldface in (50). How do these fit into the syntactic structure?

For a start, it is clear that the phrase structure for Verb Phrases adopted in section 1 does not provide enough room for constituents expressing modifiers. Even if we adopt the elaborate structure for double object constructions in (36), all specifier and complement positions in this structure are already occupied by the arguments of the verb. At first sight, it may seem that we could simply extend this phrase structure by adding another fixed position to it that would be the designated position to host modifiers. The problem with that is that, in contrast to the number of arguments, the number of modifiers that can be added to a sentence is in principle unlimited:

(51) *Eager to fill this gap in his enormous collection, Gerald quickly bought a cd in the megastore before noon to impress his friends without realizing he already had it (...)*

Because of production/processing constraints, any actually spoken sentence will have a finite length. Also, there is only so much information that can be expressed about a single event/state. For example, a single event takes place in a particular single location

(ignoring quantum-effects), so once a modifier expressing this location is added it does not make sense to add another such modifier (except to make the first one more precise, but in that case again adding more modifiers is perfectly fine: *he was murdered in his house, in the bathroom, in the bath, underwater.*) But purely syntactically speaking there does not seem to be anything wrong with adding yet another modifier to any particular sentence. Thus, no matter how many fixed positions would be added to the X-bar phrase structure schema for phrases, it would never be enough in principle to accommodate modifiers. A more flexible means to integrate modifiers into the structure is required.

This is also shown by another crucial distinction between syntactic arguments on the one hand and modifiers on the other hand. This is the following: whenever a modifier is added to some syntactic category, the result is a category of precisely the same type. This is not so in the case of arguments. When we add an object argument to a transitive verb, the result is not another verb. This is apparent from the *do so* replacement test, as introduced in section 1.3. It was shown there that *do so* can replace a combination of verb and object, that is, a V'. In contrast, *do so* cannot replace a single verb without its object. This contrast, illustrated by the pair of examples in (52), shows that the combination of verb and object is a different type of constituent than the verb alone. (Intransitive verbs can seemingly be replaced by *do so*: *Karin walked and Frank did so, too.* It can be maintained, however, that *do so* can only replace a V'; in this case, the V' it replaces contains the verb and an empty, rather than filled, complement position.)

(52) a.   *John **ate a banana**, and Geraldine **did so**, too.*
      b.   **John **ate** a banana, while Geraldine **did so** an apple.*

In turn, when we add a subject argument to a V', the result is something that is not a V' again, as shown by the fact that the resulting constituent cannot be replaced by *do so*:

(53)   **Yesterday **Julia ate a pear** and today **did so**, too.*

In contrast, when one or more modifiers are added to a V' the result is invariably something that can still be replaced by *do so*. Apparently, then, the resulting constituent is just another V':

(54) a.   *John **ate a banana yesterday**, and Geraldine **did so**, too.*
      b.   *Danielle **read the paper at home with a cup of coffee while listening to a cd** and Arthur **did so**, too.*

Note that not only *ate a banana yesterday* is a V' in (54a), but *ate a banana*, without the modifier, is still a V' just as well. The modifier can be included in *do so* replacement (as in 54a), but it need not be, as shown by (55). (The same holds for the modifiers in 54b).

(55)   *John **ate a banana** yesterday, while Geraldine **did so** today.*

It can be concluded that in (54a) we have a V' *ate a banana*, and if this V' is extended by adding a modifier to it, the resulting constituent is still a V'.
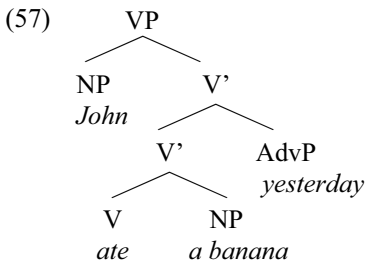
The same conclusion follows from the other test showing that verb and object form a constituent to the exclusion of the subject that was discussed in section 1. Recall that

verb and object can be fronted to the first position of a sentence together, whereas the subject cannot be part of such a fronted constituent. When we look at the behaviour of modifiers with respect to this test, again we see that they can partake in fronting, and be displaced together with the verb and object (as in 56a), while at the same time it is also possible for them not to partake in fronting and remain behind (as in 56b). If fronting is V' fronting, as assumed before in section 1.3, this, too, shows that verb and object form a smaller V' that excludes the modifier, while verb, object and modifier together also form a, larger, V'.

(56) a. *She said she was going to play the drums loudly, and play the drums loudly she did.*
      b. *He said he was going to read that book one of these days, and read the book he did yesterday.*

To accommodate these facts about modifiers, it is assumed that a particular level of syntactic phrase structure can just be iterated when there is a modifier of the constituent at that level. Thus, a sentence like *John ate a banana yesterday* has the structure in (57). (Note that in the literature modifiers that are said to modify V' here are often assumed to modify VP; this is under the assumption that the subject is not in the specifier-of-VP position but is outside of VP. This is immaterial for the essential point here, which is that a modifier does not create a new type of constituent when it is added, hence that the notion of adjunction is required to integrate them into the structure.).

(57)

```
                    VP
                  /    \
               NP       V'
              John     /  \
                     V'    AdvP
                    /  \   yesterday
                   V    NP
                  ate  a banana
```

This way of integrating modifiers into the structure is called adjunction. So, when a constituent adjoins to, for instance, V', this means an extra V'-node is created immediately above the original one, and the modifier is attached to this newly created node. An element that is attached in this way is called an adjunct.

Before we proceed, it should be noted that with respect to at least adverbial phrases that function as modifier there is a complication with the notion that whenever an adjunct is added to a phrase of a particular type the result is a phrase of exactly the same type. This has to do with certain ordering restrictions between the adverbs themselves. For example, in English an adverb like *probably* can precede an adverb like *quickly*, but not vice versa: *Mary probably quickly hid the jewels* versus **Mary quickly probably hid the jewels*. Because of this, it is not strictly true that adding, for example, *probably* to a phrase results in a phrase of exactly the same type, since before *probably* is added there is a phrase to which *quickly* can be added, whereas after *probably* is added there is a phrase to which *quickly* cannot be added. The question is whether these restrictions are

of a syntactic structural nature or of a semantic nature. Some authors have argued that they are an effect of syntactic structure. In particular, they argue that adverbs appear in designated positions in the structure, these positions being strictly hierarchically ordered, very much like argument positions (thus, for this type of modifier at least, the notion of adjunct is dispensed with). Detailed accounts of the syntax of adverbs along these lines are given in Alexiadou (1997) and Cinque (1999). Others have argued that such approaches lead to ordering paradoxes that cannot be resolved by allowing for a particular adverbial position to occur more than once in the structural hierarchy (as Cinque already argues is necessary), indicating that the ordering restrictions in question might be essentially semantic in nature and not related to syntactic structure per se; see for instance Ernst (2002, 2007) and Nilsen (2003) for discussion.
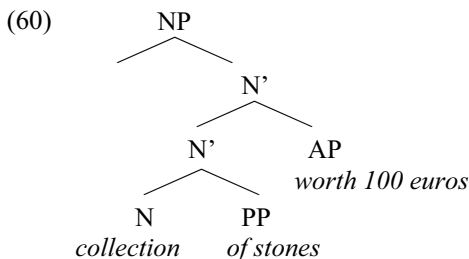
With this caveat in mind, it can be maintained that modifiers are expressed by a type of constituent, an adjunct, that combines with a particular phrase to deliver a phrase with the same phrase-structural status. This holds for modifiers of verbal constituents, as shown above, but it also holds of modifiers of other types of constituents. Consider NPs. As discussed in section 1.3, in these phrases, too, the head (the noun) and the complement form a constituent to the exclusion of the specifier. This was shown by the *one* replacement test, as illustrated by the data in (31) above. It was concluded that *one* can replace an N', but not an N or an NP. Looking now at the behaviour of modifiers in NPs with respect to *one*-replacement, it turns out that a modifier can be included in such replacement, but need not be. This is shown by the examples in (58). Again, then, the modifier does not change the nature of the constituent it modifies: when it modifies an N', it just forms a larger N' with it.

(58) a. *Rachel saw a **collection of stones worth 100 euro***, and Jack saw another **one**.
 b. *Rachel saw a **collection of stones** worth 100 euro and Jack saw another **one** worth 200 euro.*

The same test shows that the *that*-clause accompanying the noun in (59a) is a complement clause (an argument), whereas the relative clause accompanying the noun in (59b) is an adjunct.

(59) a. **The idea that this is bad for your health and the one that this can be treated by therapy are both wrong.*
 b. *This is the idea that William liked and the one that Paul dismissed.*

So, the structure of an NP with an adjunct functioning as modifier is as follows:

(60)

```
              NP
             /  \
                 N'
                /  \
              N'     AP
             /  \    worth 100 euros
            N    PP
       collection of stones
```

In a way parallel to what was shown for VPs and NPs, we can also distinguish arguments in complement position from modifiers in APs. Consider the following two APs:

(61) a. *Sam was proud of her dog.*
      b. *Sam was proud because her dog behaved well.*

These seem quite similar. Nevertheless, another replacement test, in this case with the word *so,* shows that the phrases that accompany the adjective in (61a) and (61b) behave differently. The type of *of*-phrase present in (61a) is obligatorily included in *so*-replacement, as shown by (62a−b). A *because*-clause like the one in (61b), on the other hand, may be included in such replacement but need not be, as shown by (62c−d).

(62) a. *Sam was **proud of her dog**, and Lily was **so**, too.*
      b. **Sam was **proud** of her dog, and Lily was **so** of her cat.*
      c. *Sam **was proud because her dog behaved well**, and Lily was **so**, too.*
      d. *Sam was **proud** because her dog behaved well, and Lily was **so** because her cat was not making a mess.*

This is typical of the distinction between complements and modifiers. Thus, the *of*-phrase in (61a) is a complement of the adjective and forms an A' constituent with it; the *because*-phrase in (61b) is a modifier that is attached to the A'-constituent and forms a larger A' constituent with it. (Note that the smaller A' constituent in 61b contains an empty complement position. This position can be filled just as well in this case, as in *Sam was proud of her dog because it behaved well*).

3. Distinguishing arguments from adjuncts

There are a number of ways in which syntactic arguments and adjuncts can be distinguished from each other, although there are various caveats to most of these tests. The different syntactic behaviour of arguments and adjuncts is the topic of this section.

Two of the defining differences between arguments and adjuncts were already mentioned in the previous section. First, there is no principled limit to the number of adjuncts that can be included in a sentence. In contrast, the maximum number of syntactic arguments that can appear seems to be three (though see 7 for a possible counterexample), namely the subject, direct object and indirect object in a sentence headed by a ditransitive verb. Second, and probably related to the first difference, adding an adjunct to a constituent results in a constituent of the same type, that is, a constituent with the same phrase structural status. This is evidenced by the fact that the constituent with the adjunct behaves in exactly the same way as the same constituent without the adjunct with respect to replacement and displacement tests. In contrast, adding an argument to a constituent gives a constituent of a different type.

A third criterion that is often used to distinguish arguments from adjuncts concerns the question whether a particular constituent occurs obligatorily or only optionally. Arguments are said to be obligatory, whereas adjuncts are optional additions to a sentence.

Arguments certainly can be obligatory. A VP headed by a verb like *destroy* or *examine*, for example, seems to be only felicitous if the direct object argument of these verbs

appears. This argument cannot be omitted even if it has a generic or non-specific reading, as (63c) and (64c) show.

(63)   a.   *The Vandals destroyed the town.*
       b.   **The Vandals destroyed.*
       c.   **The Vandals were destroying constantly, so they became notorious for it.*

(64)   a.   *The doctor examined the patients.*
       b.   **The doctor examined yesterday.*
       c.   **This doctor examines for a living.*

On the other hand, in section 1 it was already shown that arguments can sometimes be left out. The direct object argument of many transitive verbs can in fact be left out quite easily:

(65)   a.   *David was eating Brussels sprouts.*
       b.   *David was eating.*

(66)   a.   *Harriet was reading the newspaper.*
       b.   *Harriet was reading.*

The criterion to distinguish arguments and adjuncts on the basis of their obligatoriness therefore must be more subtle at least: it should be that, in contrast to arguments, adjuncts are never obligatory.

   Note that, according to this criterion, a locative PP, which usually expresses a modifier and is an adjunct, is actually an argument with a verb like *put*, since it cannot be left out of a sentence headed by this verb:

(67)   a.   *Beatrice put her bike in the shed.*
       b.   **Beatrice put her bike.*

The assumption that the locative phrase is an argument in (67a) is in line with the fact that it is also obligatorily included in *do so* replacement in this case (compare section 2):

(68)   a.   *Beatrice **put her bike in the shed** and Mary **did so**, too.*
       b.   **Beatrice **put her bike**_in the shed and Mary **did so** against the railing.*

Considering arguments and adjuncts in NPs, at first sight it seems that here not even arguments are ever obligatory. Consider the contrast between leaving out the complement to verbs like *examine* or *destroy* (bad, see 63−64) versus leaving out the complement to a nominalization of these verbs, which is apparently possible:

(69)   a.   *Their examination of the candidates took a long time.*
       a′.   *The examination was difficult.*
       b.   *The enemy's destruction of the city was awful to watch.*
       b′.   *The destruction was terrible.*

However, deverbal nouns like *examination* or *destruction* have two different readings: they can either express an event, or the result of that event. For instance, *destruction* can mean "the act of destroying", but also "the result of the act of destroying". This distinc-

tion is crucial when considering what the argument structure of such nouns is, as extensively discussed by Grimshaw (1990). She points out that in the event reading the arguments are in fact obligatorily present. Indeed, in the examples in (69a') and (69b'), where the arguments are left out, the noun can only have the result reading. Perhaps, then, the result nouns do not actually take arguments, whereas with the proper event nouns the arguments are as obligatory as they are with the verb from which these are derived. With this proviso, then, it may be possible to maintain the criterion to distinguish arguments from adjuncts that says that arguments, but not adjuncts, can sometimes be obligatory, also in NPs.

However, this criterion is not without its problems. In some contexts, phrases that appear to be genuine adjuncts can nevertheless not be left out without this resulting in an infelicitous sentence. For example, in the active sentence (70a), the PP *in 1959* appears to be a bona fide adjunct, and as expected it is optional (see 70b). Nevertheless, in the passive counterpart of this sentence, given in (71a), it seems that the same phrase needs to be present to render the sentence felicitous, as illustrated by (71b).

(70) a. *Jones and Co built these houses in 1959.*
     b. *Jones and Co built these houses.*

(71) a. *These houses were built in 1959.*
     b. **These houses were built.*

Middle sentences (see section 1.4) are also often degraded if they do not contain a modifying adjunct phrase:

(72) a. *This book reads well.*
     b. **This book reads.*

(73) a. *This is the soup that eats like a meal.*
     b. **This is the soup that eats.*

It may be that the apparently obligatory presence of the adjunct in the relevant sentences is caused by pragmatic, rather than syntactic, factors. Simply put, these sentences do not seem to convey any relevant information without the adjunct. For example, since all houses are built, rather than arising out of thin air, (71b) does not provide anyone with any information that is not already part of their general world knowledge. Note that the sentence is saved by adding just any modifier that provides some new information, it need not be the time adverbial of (71a). Even expressing the Agent (rather than a semantic modifier) in an adjunct *by*-phrase is enough to render the passive felicitous:

(74) *These houses were built by Jones and Co.*

Similarly, it is a property of any (normal) book that it can be read, so (72b) is not informative. But it is certainly not a property of any book that it is easy to read, so (72a) is. When the middle sentence expresses a property of its subject that is already distinctive without the presence of a modifier, then including such an adjunct in a middle is not, in fact, always necessary:

(75) *This dress buttons (whereas the other one has a zip).*

For more discussion, see Grimshaw and Vikner (1993) on passives, and Fagan (1992) and Ackema and Schoorlemmer (2005) on middles. For problems with the pragmatic account of the obligatory presence of a modifier in most middle sentences, see Leka-kou (2006).

The next criterion that is sometimes said to differentiate between arguments and adjuncts concerns the category of the phrases they are expressed by. Within VPs, the prototypical argument is an NP, whereas the prototypical adjunct is a PP or an adverbial phrase. (Within NPs, arguments are typically expressed by NPs or PPs, while typical adjuncts are APs or PPs). The reader can verify this by looking over the examples given so far in this chapter. It is clear as well, however, that there are all sorts of exceptions to this generalization.

For a start, both arguments and adjuncts can be realized by embedded clauses, rather than NPs or PPs. For arguments this is illustrated by (76a) (containing a subject clause) and (76b) (containing an object clause), whereas (77) gives examples containing adjunct clauses. (That both arguments and adjuncts can be realised by a clause in NPs as well was already illustrated by the examples illustrating the difference between complement clauses and relative clauses, see 59).

(76) a. [*That smoking is bad for your health*] *worries most people.*
      b. *I never knew* [*that that song was written by Brahms*].

(77) a. *Harry met Sally* [*while he was working in a bar*].
      b. *Sally likes Harry* [*because he works in a bar*].

More seriously, arguments can be realized by the categories that, according to the crite-rion discussed, are supposed to be prototypical for adjuncts, and vice versa. Thus, there can be PP arguments, and there can be NP adjuncts, in VPs. Starting with the latter, bare NP adverbials in English include adjuncts such as the time adverbial in (78).

(78) *Harry met Sally* **the other day**.

PP-arguments come in various guises. In copular sentences the subject can be a PP expressing location or time, for example, as in the following:

(79) a. **Under the bed** *is a good hiding place.*
      b. **After three o'clock** *is not a good time for me.*

Some verbs have the idiosyncratic property that they select for a particular preposition to introduce their complement, instead of this complement being an NP. Examples of such PP-complements are the phrases in boldface in (80).

(80) a. *David counts* **on Carol** *to do that job.*
      b. *Our firm strongly believes* **in good customer service**.

That the PPs in (80) are really complements (that is, arguments), rather than modifying adjuncts, shows itself in a number of ways. For a start, it should be noted that the preposition in these cases is semantically bleached: it does not express a location, time, direction, or anything like that anymore, but is really meaningless. (The choice of prepo-

sition for a PP-complement with a particular verb is unpredictable and can vary idiosyncratically from language to language, even if the same verb takes a PP-complement in the different languages). Also, the tests introduced in section 1 show that these PPs are complements: they are obligatorily included in *do so* replacement and in V'-fronting:

(81) a. *David **counts on Carol**, and Harry **does so** too.*
     b. **David **counts** on Carol and Harry **does so** on Jane.*

(82) a. *David said he would count on Carol, and count on Carol he did.*
     b. **David said he would count on Carol, and count he did on Carol.*

Considering next arguments and adjuncts in NPs, it appears that here the distinction in terms of category disappears altogether in English, since complements must standardly be expressed by a PP, rather than NP, in this environment:

(83) a. *the collection of mushrooms*
     a'. **the collection mushrooms*

Note, though, that as in PP-complements to verbs, the preposition introducing the complement in (83a) is meaningless. In older English, as in many other languages, complements to nouns could in fact be expressed by NPs, as long as these bore a particular type of case morphology (typically the genitive). It seems that the meaningless preposition has somehow taken over the role of the case morphology that was lost in the history of English (see for instance Weerman and De Wit 1999 for discussion).

All in all, distinguishing arguments and adjuncts on the basis of their lexical category is rather shaky. Another way in which arguments and adjuncts have been claimed to behave differently is rather more subtle than the ones discussed so far. This concerns their behaviour under movement.

Consider wh-movement in English. As is well-known, both arguments and adjuncts can undergo long-distance wh-movement (movement out of an embedded clause into the matrix clause).

(84) a. *[Which book]$_i$ do you think [that John read e$_i$ yesterday]?*
     b. *[Why]$_i$ do you think [that John read that book e$_i$ yesterday]?*

But as is also well-known, such movement is degraded if the extracted element originates inside an island (Ross 1967), such as the wh-island in (85).

(85) *??[Which book]$_i$ do you wonder [whether John read e$_i$ yesterday]?*

Although moving a constituent out of an island is always bad, it seems that arguments and adjuncts differ in how bad it is to extract them in this way. Taking an adjunct out of an island appears to give a worse result than doing the same with an argument (Chomsky 1986; Rizzi 1990). Compare (85) with (86), in which an adjunct is extracted out of the wh-island.

(86) **[Why]$_i$ do you wonder [whether John read that book e$_i$ yesterday]?.*

While it is possible at least to assign (85) its intended meaning (despite its degraded status), in (86) it seems impossible altogether to associate *why* with the predicate of the embedded clause.

It is doubtful, however, that the difference between (85) and (86) really reflects an argument-adjunct distinction. The real distinction appears to be between phrases that are discourse-linked (d-linked) and phrases that are not. A d-linked phrase is a phrase that refers to something that has already been mentioned in the current discourse. Using a *which*-phrase such as *which book* in (85) usually implies that the hearer is already famil-iar with a particular set of books and is now asked to pick one of them as the answer to the question. Using a bare question phrase such as *why* in (86) has no similar implication, however, and for some reason this seems to make it more difficult to extract such a phrase from an island (for possible explanations of this see Pesetsky 1987; Rizzi 1990; Cinque 1990; Kluender 1998; Van Craenenbroeck 2010, among many others). Crucially, this also holds when the questioned phrase is an argument rather than an adjunct. Thus, at least in an out-of-the-blue context, where *what* cannot be d-linked, (87) seems to have the same, strongly ungrammatical, status as (86).

(87)   *[What]$_i$ do you wonder [whether John read e$_i$]

Conversely, replacing *why* in (86) by a d-linked phrase such as *for which of these reasons* gives a measurably better result (see for instance Kluender 1998). If so, the impression that this difference concerns a difference between arguments and adjuncts arises from the fact that it is less likely for modifiers to be d-linked than it is for arguments. (Inciden-tally, it should be noted that this discussion on extraction ignores a further distinction within the class of arguments themselves: while long-distance displacement of objects is fine as long as the object is not taken out of an island, displacement of subjects is degraded in English if the subject is taken from a clause that is introduced by a comple-mentizer; on this so-called *that*-trace effect see Chomsky and Lasnik 1977; Rizzi 1990, 2006; Culicover 1993; Ackema and Neeleman 2004, among many others. Also ignored here is the distinction between weak islands, such as the wh-islands just discussed, and strong islands, out of which even extraction of any argument is prohibited; see for in-stance Huang 1982 and Szabolcsi and Den Dikken 2003 for discussion).

The final difference between arguments and adjuncts to be discussed here concerns some of the processes of argument structure manipulation discussed in section 1.4. In some of these processes, something that is not usually the subject of a verb becomes the subject when the process is applied. For example, a Theme argument or a Goal argument can become the subject when passivisation is applied, and Theme arguments can become subjects in middle sentences. Adjuncts, however, do not seem to be able to acquire subject status in this way, as the contrast between the passives in (88b) and (88b'), and the contrast between the middles in (89b) and in (89b'), show.

(88)   a.   *They built the houses in 1959.*
       b.   *The houses were built in 1959.*
       b'. **In 1959 was built the houses.* / *1959 was built the houses.*

(89)   a.   *They read the book on the train.*
       b.   *Such books read easily on the train.*
       b'. **On the train reads such books easily.* / *The train reads such books easily.*

This difference between arguments and adjuncts, too, is not entirely without apparent exceptions. In some instances of the so-called pseudo-passive, an active sentence containing a phrase that to all intents and purposes looks like an adjunct PP is turned into a passive in which the complement of the preposition in this PP is promoted to subject, leaving the preposition stranded with the verb; examples are given in (90) (cf. Hornstein and Weinberg 1981).

(90) a.   *The author wrote the manuscript with a pen.*   (active)
      a′. *This pen has never been written with.*   (pseudo-passive)
      b.   *Someone has slept in this bed.*   (active)
      b'. *This bed has been slept in.*   (pseudo-passive)

In some languages other than English something similar is possible in middle sentences. Dutch, for example, allows adjunct middles as in (91a') and (91b').

(91) a.   *Die club voetbalt op kunstgras.*   (active)   [Dutch]
           that club footballs on artgrass
           'That club plays football on artificial grass'

      a′. *Kunstgras voetbalt niet zo lekker.*   (middle)
           artgrass   footballs not so nicely
           'Artificial grass is not so nice for playing football on'

      b.   *Ik zit altijd   in deze stoel.*   (active)
           I   sit always in this   chair
           'I always sit in this chair'

      b′. *Deze stoel zit lekker.*   (middle)
           this   chair sits nicely
           'This chair is comfortable to sit in'

As the examples indicate, in these cases the preposition that appears in the adjunct PP in the active disappears altogether when its complement is promoted to subject in the middle (see Hoekstra and Roberts 1993 and Ackema and Schoorlemmer 1994 for discussion).

4. Conclusion

The distinction between semantic arguments and modifiers seems to have a correlate in syntax in that there seems to be a structural distinction between syntactic constituents that express an argument and those that express a modifier. The latter appear in the structure as adjuncts, the former as (syntactic) arguments. Several other syntactic distinctions have been argued to correlate with this basic distinction, though the further criteria by which the two are distinguished are not entirely clear-cut, and allow for some grey areas or exceptional cases.

9. Acknowledgements

5. References (selected)

Ackema, Peter, and Ad Neeleman
  2004   *Beyond Morphology*. Oxford: Oxford University Press.
Ackema, Peter, and Maaike Schoorlemmer
  1994   The middle construction and the syntax-semantics interface. *Lingua* 93: 59−90.
Ackema, Peter, and Maaike Schoorlemmer
  1995   Middles and non-movement. *Linguistic Inquiry* 26: 173−197.
Ackema, Peter, and Maaike Schoorlemmer
  2005   Middles. In: M. Everaert and H. van Riemsdijk (eds.), *The Blackwell Companion to Syntax* vol. III, 131−203. Oxford: Basil Blackwell.
Alexiadou, Artemis
  1997   *Adverb Placement*. Amsterdam: John Benjamins.
Alexiadou, Artemis, Elena Anagnostopoulou, and Martin Everaert (eds.)
  2003   *The Unaccusativity Puzzle*. Oxford: Oxford University Press.
Alsina, Alex, and Sam Mchombo
  1993   Object asymmetries and the Chichewa applicative construction. In: S. Mchombo (ed.), *Theoretical Aspects of Bantu Grammar 1*, 17−46. Stanford: CSLI Publications.
Aranovich, Raul, and Jeffrey Runner
  2000   Diathesis alternations and rule interaction in the lexicon. In: K. Meegerdomian and L. A. Bar-el (eds.), *Proceedings of WCCFL 20*, 15−28. Somerville, MA: Cascadilla Press.
Authier, Jean-Marc, and Lisa Reed
  1996   On the Canadian French middle. *Linguistic Inquiry* 27: 513−523.
Baker, Mark
  1985   The mirror principle and morphosyntactic explanation. *Linguistic Inquiry* 16: 373−416.
Baker, Mark
  1988a   *Incorporation*. Chicago: University of Chicago Press.
Baker, Mark
  1988b   Theta theory and the syntax of applicatives in Chichewa. *Natural Language and Linguistic Theory* 6: 353−389.
Baker, Mark
  1996   *The Polysynthesis Parameter*. Oxford: Oxford University Press.
Baker, Mark, Kyle Johnson, and Ian Roberts
  1989   Passive arguments raised. *Linguistic Inquiry* 20: 219−251.
Bobaljik, Jonathan
  1993   On ergativity and ergative unergatives. *MIT Working Papers in Linguistics* 19: 45−88.
Bok-Bennema, Reineke
  1991   Case and agreement in Inuit. PhD dissertation, University of Tilburg.
Bouchard, Denis
  1995   *The Semantics of Syntax*. Chicago: University of Chicago Press.
Chomsky, Noam
  1970   Remarks on nominalization. In: R. Jacobs and P. Rosenbaum (eds.), *Readings in English Transformational Grammar*, 184−221. Waltham, MA: Ginn.
Chomsky, Noam
  1981   *Lectures on Government and Binding*. Dordrecht: Foris.

Chomsky, Noam
   1986   *Barriers*. Cambridge, MA: MIT Press.
Chomsky, Noam
   1995   *The Minimalist Program*. Cambridge, MA: MIT Press.
Chomsky, Noam, and Howard Lasnik
   1977   Filters and control. *Linguistic Inquiry* 8: 425−504.
Cinque, Guglielmo
   1990   *Types of A'-Dependencies*. Cambridge, MA: MIT Press.
Cinque, Guglielmo
   1999   *Adverbs and Functional Heads*. Oxford: Oxford University Press.
Culicover, Peter
   1993   Evidence against ECP accounts of the that-t effect. *Linguistic Inquiry* 24: 557−561.
Culicover, Peter, and Ray Jackendoff
   2005   *Simpler Syntax*. Oxford: Oxford University Press.
Den Dikken, Marcel
   1995   *Particles*. Oxford: Oxford University Press.
Dixon, R. M. W.
   1972   *The Dyirbal Language of North Queensland*. Cambridge: Cambridge University Press.
Ernst, Thomas
   2002   *The Syntax of Adjuncts*. Cambridge, Cambridge University Press.
Ernst, Thomas
   2007   On the role of semantics in a theory of adverb syntax. *Lingua* 117: 1008−1033.
Fagan, Sarah
   1988   The English middle. *Linguistic Inquiry* 19: 181−203.
Fagan, Sarah
   1992   *The Syntax and Semantics of Middle Constructions*. Cambridge: Cambridge University Press.
Gazdar, Gerald, Ewan Klein, Geoffrey Pullum, and Ivan Sag
   1985   *Generalized Phrase Structure Grammar*. Cambridge, Mass.: Harvard University Press.
Grimshaw, Jane
   1979   Complement selection and the lexicon. *Linguistic Inquiry* 10: 279−326.
Grimshaw, Jane
   1990   *Argument Structure*. Cambridge, MA: MIT Press.
Grimshaw, Jane, and Sten Vikner
   1993   Obligatory adjuncts and the structure of events. In: E. Reuland and W. Abraham (eds.), *Knowledge and Language* vol. II, 145−159. Dordrecht: Kluwer.
Hale, Ken
   1983   Warlpiri and the grammar of non-configurational languages. *Natural Language and Linguistic Theory* 1: 5−47.
Hale, Ken, and Samuel J. Keyser
   1993   On argument structure and the lexical expression of syntactic relations. In: K. Hale and S. J. Keyser, *The View from Building 20*, 53−109. Cambridge, MA: MIT Press.
Hoekstra, Teun, and Ian Roberts
   1993   The mapping from the lexicon to syntax: null arguments. In: E. Reuland and W. Abraham (eds.), *Knowledge and Language* vol. II, 183−220. Dordrecht: Kluwer.
Hornstein, Norbert, and Amy Weinberg
   1981   Case theory and preposition stranding. *Linguistic Inquiry* 12: 55−92.
Huang, C.-T. James
   1982   Logical relations in Chinese and the theory of grammar. PhD dissertation, MIT.
Hyman, Larry
   2003   Suffix ordering in Bantu: A Morphocentric Approach. In: G. Booij and J. van Marle (eds.), *Yearbook of Morphology 2002*, 245−281. Dordrecht: Kluwer.

Jackendoff, Ray
   1977   *X-bar Syntax*. Cambridge, MA: MIT Press.
Jackendoff, Ray
   1990a   *Semantic Structures*. Cambridge, MA: MIT Press.
Jackendoff, Ray
   1990b   On Larson's treatment of the double object construction. *Linguistic Inquiry* 21: 427−456.
Jackendoff, Ray
   1993   On the role of conceptual structure in argument selection: a reply to Emonds. *Natural Language and Linguistic Theory* 11: 279−312.
Jaeggli, Osvaldo
   1986   Passive. *Linguistic Inquiry* 17: 587−622.
Jelinek, Eloise
   1984   Empty categories, Case, and configurationality. *Natural Language and Linguistic Theory* 2: 39−76.
Jelinek, Eloise
   2006   The pronominal argument parameter. In: P. Ackema, P. Brandt, M. Schoorlemmer and F. Weerman (eds.), *Arguments and Agreement*, 261−288. Oxford: Oxford University Press.
Johns, Alana
   1987   Transitivity and grammatical relations in Inuktitut. PhD dissertation, University of Ottawa.
Kiss, Katalin É. (ed.)
   1995   *Discourse Configurational Languages*. Oxford: Oxford university Press.
Kluender, Robert
   1998   On the distinction between strong and weak islands: a processing perspective. In: P. Culicover and L. McNally (eds.), *The Limits of Syntax*, 241−279. San Diego: Academic Press.
Kozinsky, Isaac, Vladimir Nedjalkov, and Maria Polinskaja
   1988   Antipassive in Chuckchee. In: M. Shibatani (ed.), *Passive and Voice*, 651−706. Amsterdam: John Benjamins.
Larson, Richard
   1988   On the double object construction. *Linguistic Inquiry* 19: 335−92.
Lasnik, Howard, and Tim Stowell
   1991   Weakest crossover. *Linguistic Inquiry* 22: 687−720.
Lekakou, Marika
   2004   In the middle, somewhat elevated. Ph.D. dissertation, University College London.
Lekakou, Marika
   2006   A comparative view of the requirement for adverbial modification in middles. In: B. Lyngfelt and T. Solstad (eds.), *Demoting the Agent*, 167−196. Amsterdam: John Benjamins.
Levin, Beth, and Malka Rappaport Hovav
   1994   *Unaccusativity*. Cambridge, MA: MIT Press.
Marantz, Alec
   1984   *On the Nature of Grammatical Relations*. Cambridge, Mass.: MIT Press.
Marelj, Marijana
   2004   Middles and argument structure across languages. PhD dissertation, Utrecht University. LOT Dissertation Series 88.
Mchombo, Sam (ed.)
   1993   *Theoretical Aspects of Bantu Grammar 1*. Stanford: CSLI Publications.
Neeleman, Ad, and Fred Weerman
   1999   *Flexible Syntax*. Dordrecht: Kluwer.
Ngonyani, Deo, and Peter Githinji
   2006   The asymmetric nature of Bantu applicative constructions. *Lingua* 116: 31−63.

Nilsen, Øystein
    2003   Eliminating positions. PhD dissertation, Utrecht University. LOT Dissertation Series 73.
Pesetsky, David
    1987   Wh-in-situ: movement and unselective binding. In: E. Reuland and A. ter Meulen (eds.), *The Representation of (In)definiteness*, 98−129. Cambridge, MA: MIT Press.
Pesetsky, David
    1995   *Zero Syntax*. Cambridge, MA: MIT Press.
Polinsky, Maria
    2005   Antipassive constructions. In: M. Haspelmath, M. Dryer, D. Gil and B. Comrie (eds.), *The World Atlas of Language Structures*, 438−441. Oxford: Oxford University Press.
Postal, Paul
    1971   *Cross-over Phenomena*. New York: Holt, Rinehart and Winston.
Postal, Paul
    1986   *Studies of Passive Clauses*. Albany: SUNY Press.
Postal, Paul
    1993   Remarks on weak crossover effects. *Linguistic Inquiry* 24: 539−556.
Reinhart, Tanya
    2002   The Theta System: an overview. *Theoretical Linguistics* 28: 229−290.
Reinhart, Tanya, and Eric Reuland
    1993   Reflexivity. *Linguistic Inquiry* 24: 657−720.
Reinhart, Tanya, and Tal Siloni
    2005   The lexicon-syntax parameter: reflexivization and other arity operations. *Linguistic Inquiry* 36: 389−436.
Rizzi, Luigi
    1986   Null objects in Italian and the theory of pro. *Linguistic Inquiry* 17: 501−557.
Rizzi, Luigi
    1990   *Relativized Minimality*. Cambridge, MA: MIT Press.
Rizzi, Luigi
    2006   On the form of chains: criterial positions and ECP effects. In: L. Cheng and N. Corver (eds.), *Wh-Movement: Moving On*, 97−133. Cambridge, MA: MIT Press.
Ross, John Robert
    1967   Constraints on variables in syntax. Ph.D. dissertation, MIT.
Ruys, E.G.
    2000   Weak crossover as a scope phenomenon. *Linguistic Inquiry* 31: 513−540.
Schäfer, Florian
    2009   The causative alternation. *Language and Linguistics Compass* 3: 641−681.
Siewierska, Anna
    1984   *The Passive*. London: Croom Helm.
Spencer, Andrew, and Louisa Sadler
    1998   Morphology and argument structure. In: A. Spencer and A. Zwicky (eds.), *The Handbook of Morphology*, 206−236. Oxford: Blackwell.
Steinbach, Markus
    2002   *Middle Voice*. Amsterdam: John Benjamins.
Stroik, Thomas
    1992   Middles and movement. *Linguistic Inquiry* 23: 127−137.
Szabolcsi, Anna, and Marcel den Dikken
    2003   Islands. In: L. Cheng and R. Sybesma (eds.), *The Second* Glot International *State-of-the-Article Book*, 213−240. Berlin: Mouton de Gruyter.
Van Craenenbroeck, Jeroen
    2010   Complex wh-phrases don't move. In: P. Panagiotidis (ed.). *The Complementizer Phase*, 236−260. Oxford: Oxford University Press.

Van de Visser, Mario
  2006   The marked status of ergativity. PhD dissertation, Utrecht University. LOT Dissertation
          Series 141.
Weerman, Fred, and Petra de Wit
  1999   The decline of the genitive in Dutch. *Linguistics* 37: 1155−1192.
Williams, Edwin
  1981   Argument structure and morphology. *The Linguistic Review* 1: 81−114.

Peter Ackema, Edinburgh (UK)

10. The Morpho-Syntactic Realisation of Negation

1. Introduction
2. Expressing negation
3. Negative Concord
4. Negative indefinites and split-scope effects
5. Multiple negative particles
6. Conclusion
7. References (selected)

Abstract

Every natural language has some lexical element at its disposal to reverse the truth-conditional content of a sentence. Sometimes, sentences are rendered negative by means of a negative marker, sometimes by means of a negative indefinite, and sometimes even by a combination of both of them. It turns out that the syntactic and semantic behaviour of these negative markers and indefinites is much more complex than may be initially thought. In this chapter, I discuss the general syntactic and semantic properties of both negative markers and negative indefinites and I focus on three particular phenomena that shed more light on these intricate syntactic and semantic properties: negative concord, split-scope readings, and the co-occurrence of multiple negative markers in a single clause.

1. Introduction

Every natural language has some device at its disposal to reverse the truth-conditional content of a sentence. Take, for instance, the examples in (1).

(1)   a.   *John walks*
        b.   *John does not walk*