I   Issues of compositionality

INTRODUCTION TO PART I

The aim of this book is to present a theory about aspectual properties of sen-
tences in natural language. These are properties allowing sentences to express
temporal structure with respect to which they are interpreted. Sentences may
pertain to states or processes or events, they may express boundedness, dura-
tion, repetition, semelfactivity, frequency, habituality, and many other forms
of temporality. The question put in its simplest and crudest form is: how do
they do this? The answer to this question will be given in terms of the opposi-
tion between terminative aspect (roughly, the expression of boundedness) and
durative aspect (roughly, the expression of unboundedness). More particularly,
it will be given by presenting a theory about the way terminative aspect is
compositionally formed on the basis of semantic information expressed by dif-
ferent syntactic elements, in particular the verb and its arguments. It will be
argued that an aspectual theory is explanatorily adequate only if it treats the
opposition between terminative and durative aspect structurally. The focus of
the theory proposed in the present study will be on the interaction between the
temporal and atemporal information contributed by constituents involved in
aspect construal.

Part I is introductory in the sense that it will try to clarify crucial issues
which are involved. In chapter 1, some preliminary notions will be explained,
identifying step by step the scope of this study. The provisional picture emerg-
ing is that of a simple 'aspectual feature algebra'. The claim is that, on the basis
of semantic information associated with specific syntactic elements, it can be
predicted whether or not a sentence is terminative. The semantic information
associated with the verb (the feature playing a role in terminative aspect con-
strual will be called [+ADD TO] and it expresses (roughly) progress in time) will
amalgamate with the semantic information associated with the argument NPs
of the verb (the feature involved in terminative aspect will be called [+SQA] and
it expresses (roughly) a Specified Quantity of the entities introduced by the
head noun of the NP). The use of features is temporary and just for conceptual
convenience: it is much easier to give first an overall idea of the aspectual the-
ory by using a sort of informal 'feature algebra', and then proceed by replacing
the features by expressions of a standard formal language, as will be done in
Part II and Part III.

The compositional approach on the basis of semantic information scattered
over constituents in the sentential structure is in conflict with the idea of aspec-
tual classes, such as Vendler's popular verb classes. Vendler (1957) proposed a
quadripartition – States, Activities (unbounded processes), Accomplishments

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(bounded processes) and Achievements (point events) – breathing new life into an old Aristotelian classification (actually a tripartition) of situational types. The classification is non-linguistic, as it concerns situational categories, but linguistic criteria are used to distinguish the classes from one another. This made Vendler's work of interest to linguists: they started to distinguish State verbs, Activity verbs, Accomplishment verbs and Achievement verbs. Among linguists accepting this division, the idea seems to be that, even though the specific linguistic criteria may vary across different languages, every language can produce congenial criteria so as to give Vendler's quadripartition a solid grounding as part of an aspectual theory.

In my view, Vendler's classification runs afoul of the evidence emerging from the linguistic tradition in the first half of this century that aspect is essentially a non-lexical property of sentence structure, both in non-Slavic and Slavic languages. Yet many formal semanticists use it as part of their aspectual theory. These two things cannot be married: if aspect formation is a process at a structural level it is hard to see how a lexical division can be maintained. It will be shown in chapter 2 that theories appealing to Vendler classes are hampered if they set out to treat aspect as something that is to be assigned to complex structure. In chapter 2.10, it will be made clear why in a theory of aspect construal the interaction between atemporal and temporal structure must be given a central place.[1]

1   *The Plus-principle*

1.0   Introduction

To evade the notorious terminological problems connected with the definition of aspect, I shall simply say at this point that central to the present theory is the conviction that, in English, sentences like (1)–(4) differ in a number of important respects and that an aspectual theory is called for to describe and explain these differences.[2]

(1)   Judith ate a sandwich
(2)   Judith ate sandwiches
(3)   Judith ate bread
(4)   Judith ate no sandwich

One may analyse these sentences atemporally, as numerous generations of linguists and logicians have done, exclusive of (2) and (3). One way to do this is to represent the meaning of (1) and (4) in terms of a formal atemporal logic, say first-order predicate logic (including propositional logic). For example, one could express the difference in meaning with the help of the following logical formulas:

(5) $\exists x(Sandwich(x) \wedge Eat(Judith,x))$
(6) $\neg \exists x(Sandwich(x) \wedge Eat(Judith,x))$

This is how linguists of the sixties and the early seventies thought logicians were bound to represent the meaning difference between these sentences.[3] However, it is evident that (1)–(4) express temporality: they pertain to something going on in time or being the case during a certain period of time preceding the point of speech. This is not expressed by (5) and (6). In the past twenty-five years, linguists and logicians have started to realize that there is a temporal perspective from which these sentences may be studied and that representations like (5) and (6) should be replaced or at least extended.[4] Different sorts of formal means have been introduced to account for the properties which are temporally relevant, some of which will be discussed in this study.

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The properties relevant for the study of terminative and durative aspect can be isolated on the basis of tests. A well-known test to separate (1) from (2) and (4) is to combine the sentences with two sorts of temporal adverbial:

(7)   #Judith ate a sandwich for an hour
(8)   Judith ate a sandwich in an hour

(9)   Judith ate sandwiches for an hour
(10)   ?Judith ate sandwiches in an hour

(11)   Judith ate bread for an hour
(12)   ?Judith ate bread in an hour

(13)   Judith ate no sandwich for an hour
(14)   ?Judith ate no sandwich in an hour

In (7), the semelfactive reading is excluded in which Judith ate and consumed one sandwich. If (7) can be given an interpretation, it must mean that she re-peatedly ate a sandwich or that she ate *from* one sandwich during a period last-ing an hour. If they do not want to reject (7), people feel themselves forced into a repetition or into stretching out an event, for example by taking (7) as expressing that it took Judith an hour to eat a sandwich. Forced repetition or forced stretching will be indicated throughout this study by the symbol #. It is important to stress here that aspectual theory should focus on the question of which property it is that blocks the normal single-event reading of (1). And more fundamentally: what is actually blocked? On the other hand, in (9), (11) and (13) 'normal' interpretations are possible: like (2), sentence (9) reports about an eating which is presented as a process going on unboundedly; the same applies to (11), whereas (13) reports about a state just as in (4).

The sentences (8), (10), (12) and (14) form a second aspectual test: (8) says that Judith completed the eating of a sandwich within an hour. That is, one may read (1) such that its meaning is compatible with *in an hour*: the event of her eating a sandwich is completed in a period which is shorter than an hour. On the other hand, (10), (12) and (14) have question-marks. Again (2)–(4) behave differently: they cannot occur with adverbials like *in an hour*, which evidently require something bounded. Sentence (10) is as bad as *Judith walked in an hour*, so if *Judith walked* pertains to something unbounded, (2) must also pertain to something unbounded, just like *Judith ate bread* and *Judith ate no sandwich*. In chapter 2, more attention will be paid to aspectual tests like these. Here they merely serve to identify and demarcate the area of the present study.

The specific semantic effects resulting from combining (1)–(4) with the two temporal adverbials reveal that it is necessary for anyone who sets out to describe the differences and correspondences between (1)–(4) to take into account the temporal structure of these sentences. In my view, this is what an aspectual theory is about, or should be about. Intuitively, the theory involves temporal quantification, as is suggested by the use of such (still impressionistic) phrases as 'single event reading', 'repetition', 'process going on', etc. Central to the aspectual theory of the present study will quantification indeed be, both temporal and atemporal, as the difference between (1) and (2) must at least partially be attributed to a difference between *a sandwich* and *sandwiches*.

The study of aspectual properties turns out to be relevant for the analysis of multiple quantification expressed in sentences like:

(15)   Two girls ate five sandwiches
(16)   The three men lifted four pianos

which have received a lot of attention in the literature, mostly in terms of an atemporal binary relation between members of a set of two girls (three men) and a set of five sandwiches (four pianos), as for example in Kempson and Cormack (1981), Scha (1981), Gil (1982), Link (1983, 1984) and Lønning (1987b).[5] These authors did not observe that the sentences (15) and (16) are terminative, and if they did, they did not bother to give this semantic property its place as a part of their analysis. This kept them from trying to explain why (17) and (18) do not exhibit the same quantificational behaviour as (15) and (16).

(17)   Two girls ate no sandwich
(18)   The three men did not lift four pianos

In (16), for example, it is possible to have three different liftings in mind involving twelve different pianos altogether, but also one lifting in which three men and four pianos were involved. The interpretation of (16) seems to range over a scale from a purely collective extreme (all the three men lifted four pianos together at one time) and a purely distributive extreme (each of the men lifted four different pianos at different times one after the other). Two facts must be explained with respect to sentence (18). The first one is that if (18) is taken contrastively (say, by continuing with … *but six*), it remains terminative. The second one is that under a non-contrastive reading one is not bound to interpret (18) as pertaining to values between the two extremes. It is simply denied that there was a lifting of four pianos and one is not forced to commit oneself to

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a possible way of non-lifting between the two extremes. In other words, under a non-contrastive reading there is no point in giving (18) a collective or a distributive interpretation (for some discussion see Lønning 1989).

One of the questions posed in the present study is how the opposition between terminative and durative relates to the opposition between distributive and collective. It will be shown that there is a close relationship and that the answer must be found in looking at the interaction between temporal structure induced by the verb and the atemporal structure expressed by its argument NPs. The need to include the analysis of atemporal quantifiers in the aspectual theory will lead to the treatment of terminative sentences like *Judith ate three sandwiches*, *Two girls ate some sandwiches*, *At least one man lifted four pianos*, *At most three children came in* and *Many children came in*. These sentences are interesting from two points of view: (i) they contain so-called generalized quantifying expressions, like *some*, *at least one*, *many*, etc.; and (ii) some of them contain two quantifying NPs so there is some need to account for their interaction. In other words, what does a sentence like *Two girls ate three sandwiches in an hour* really express? This question will be dealt with in chapter 7.4.

It will also be necessary to develop a theory about the way the verb which introduces temporal structure relates to the atemporal quantifying expressions which constitute its arguments. One of the problems connected with the analysis of atemporal quantification appears to be that in the literature sentences under analysis are mostly sentences expressing states, such as *600 Dutch firms use 5000 American computers*, *Every doctor likes some female patient* and *Four squares contain three circles*, or that sentences containing verbs expressing progress in time are treated as if they pertain to eternal states. This excludes taking into account temporal structure, even though in the informal explanation of the sentential meaning often an appeal is made to events, or situations, etc. The method involved comes close to allowing all mathematically proper combinations of members of a Cartesian product. Relations are mathematically, that is purely extensionally, treated as sets of pairs <x,y> where x and y are the elements between which the relationship holds. On this view, there is no room for the contribution of the verb itself to what is expressed by the sentences whose main predicate it is. Yet, temporal structure seems to be relevant in cases in which the arguments of a predicate can be related to different events. For example, in (16) it is evident that each of the men could have lifted the same pianos, be it on different occasions. It also appears to be evident that if two men are involved in lifting the same piano, they are involved in one and the same event as far as the piano is concerned (though each man might think

that he is the only agent involved). In general, one should rather think of sets of pairs of the form <x,<i,y>>, where i pertains to a temporal parameter generated by the verb itself. This formal machinery will be discussed in chapter 13.

There is a complication of the main issue that should be involved right from the start. In Dutch there are sentences like (19):

(19)   Judith at een boterham op
            lit.: Judith ate a sandwich up

Verbs like *eten* (eat) allow some additional morphological means to strengthen the expression of terminative aspect, as shown with the help of (20) and (21):

(20)   Judith at een boterham toen ik binnenkwam
            lit.: Judith ate a sandwich when I came in

(21)   Judith at een boterham op toen ik binnenkwam
            lit.: Judith ate a sandwich up when I came in

So, in Dutch there are verbs like *opeten* (eat up) and *opdrinken* (drink up).[6] Whereas many Dutch speakers are willing to interpret (20) as saying that Judith was eating a sandwich when I came in, (21) is to be interpreted as strongly suggesting that Judith started eating up a sandwich after I had come in, a phenomenon described in Hinrichs (1981), Kamp and Rohrer (1983), Partee (1984), Oversteegen (1989), among others. On the other hand, it is clear that (1) is terminative, as can be seen from its behaviour in (7) and (8), and so is its Dutch counterpart *Judith at een boterham*. Moreover, (20) may be given the same interpretation as (21). One might say that (19) is the strong terminative version of (1), but it is also clear that an aspectual theory cannot ignore the phenomenon of the 'strengthening' or the 'weakening' of terminativity.

In this respect, sentences like (22) are also very important for an aspectual theory, because this theory must explain why they may express completion but also allow non-completion:[7]

(22)   Jan liep naar de winkel
            John walked to/towards the store

(23)   Jan liep in vijf minuten naar de winkel
            John walked to/towards the store in five minutes

(24)   Jan liep naar de winkel, maar halverwege werd hij geraakt
            John walked to/towards the store but halfway he was hit

Like sentence (1) it meets the *in*-test in (8), as shown by (23), so one may say that (22) is terminative, but still one might say (24), allowing for the event to be inter-

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rupted (Oversteegen 1989). In view of these observations, a central place in the present study will be given to verbs like *eat*, *walk*, etc., because they represent the 'medial category' of verbs contributing to terminative aspect as contrasted with on the one hand stative verbs like *hate*, *be dead*, *concern*, *believe*, etc., which do not contribute at all, and on the other hand verbs like *buy*, *die*, *stab*, etc., which do not appear to allow interruption of the sort exemplified in (24).

   Indeterminacy as to completion is not only restricted to prepositions such as the Dutch *naar* (to/towards), it also may show up in sentences like (25):

(25)   John read a book for two hours

Fillmore (1971) observed that this sentence may have an interpretation in which John read just a part of the book, so actually he was reading a book for two hours. Hence, *John read a book* is not terminative and, contrary to what is predicted by the *for*-test in (7), there is no aspectual repetition in (25). Dowty (1986) takes this example as an indication that the approach of Verkuyl (1972), which predicts that *John read a book* is terminative, is wrong. In chapter 14, I will show that the aspectual theory expounded here, while adopting the approach attacked by Dowty – who misrepresents it, as pointed out in the introduction to Part II – can handle sentences like (25) correctly, in the same way as it will treat (20), (21) and (22).

   An important part of aspectual theory is the question of how to deal with sentences like (26):

(26)   Judith was eating a sandwich

Sentences like (26) are durative. So, a natural question is: if we take (26) as a change of (1), what has changed? This question has been raised many times in the past twenty years in the study of the Progressive Form.[8] Some say that there is an aspectual difference between (26) and (1) which is quite different from the one between (1) and (2)–(4). This difference roughly coincides with a difference between 'subjective' and 'objective' in the following sense. By choosing *was … ing* a speaker is said to place the hearer 'in the middle' of the eventuality described, whereas the event described in (1) is said to be presented 'from the outside' and hence as bounded. This opposition is considered to be subjective. On the other hand, (1) would be 'objectively' terminative because any event 'to eat a sandwich' when executed by one person is inherently bounded. This is (objectively) inherent to the nature of the event, whereas 'to eat sandwiches' is inherently and objectively unbounded. The difference between 'subjective' and 'objective' forms of aspectuality is often expressed by a terminological distinction between aspect and aktionsart.

In spite of the clear difference between sentences like (2)–(4) and (26), I find the distinction between aktionsart and aspect distracting, in particular the iden-tification of aspect with 'subjective' and aktionsart with 'objective'.[9] For example, the very distinction between a subjective and an objective way of presenting a sentence would break down as soon as one assumes that the speaker's choice of constituents like *a sandwich* and *Judith* in sentences like (1) is a subjective way of conveying information. As Galton (1984) pointed out convincingly: one may describe one and the same situation as a state, a process or an event. The same point is made by Comrie (1976). The speaker could have chosen other ways of presenting the same information. The distinction between subjective (aspect) and objective (aktionsart) remains impressionistic as long as there is no way to make the difference sufficiently explicit.

Moreover, it seems to me that the distinction between aspect and aktionsart in terms of 'subjective' and 'objective' is actually an ontological wolf in lin-guistic sheep's clothing. It is not a matter of coincidence that the distinction has become popular in the Slavistic tradition in which aspect predominantly has been taken as a morphological-lexical matter: lexical-semantic considera-tions often slip into ontological considerations. The better strategy appears to account in detail and formally for the relationship between (1) and (2)–(4), and for the relationship between (1) and (26) and to decide then how the formal machineries involved relate to one another. In chapter 3.5, formal descriptions will be given of (1)–(4), (19), (22), (25) and (26). It will be concluded there that there is nothing against making a practical distinction between aspect and aktionsart, but that the opposition does not play any theoretically significant role. To give an example, in Bulgarian (see Danchev 1992) one has not only to deal with the opposition between sentences like (27) and (28), but also between (27) and (29):

(27)   Judit izjade edin sandvič
         Judith ate (Aor.) a sandwich
(28)   Judit jadeše edin sandvič
         Judith ate (Imp.)/was eating a sandwich
(29)   Judit jadeše sandviči
         Judith ate (Imp.) sandwiches

These oppositions can be dealt with without having to appeal to notions like aspect or aktionsart. The term *aspectuality* seems to capture the whole area covered by the two notions.

By the above remarks it stands to reason that aspectuality is taken notionally in the present study: English does not grammaticalize aspectual differences, at