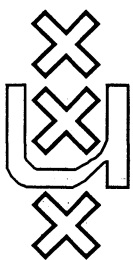


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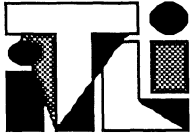
**TEMPORAL ADVERBIALS IN
THE TWO TRACK THEORY OF TIME**

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0. Introduction

Temporal adverbials indicating when some event occurs - e.g. so-called 'frame adverbials', but not adverbials of duration or frequency - form the subject of this article. These adverbials form a heterogeneous and rather troublesome group, both in syntactic and in semantic theory. I am not really concerned with the syntactic aspects of temporal adverbials (henceforth TADVs) here. As for the semantics of TADVs, a few interesting articles and books have been written that mention their behaviour. Relevant to this article are for example: Partee (1984), Hinrichs (1981), Kamp & Rohrer (1983), Smith (1980, 1983). Some of these authors have distinguished different categories of TADVs. In my opinion these boil down to the kinds of interpretations which the TADVs allow: anaphorical interpretations, deictic interpretations, or both. My first goal here is to motivate a new quadripartition of TADVs which covers the frame TADVs and which is in some sense logically exhaustive. Therefore I will have to show why I think the existing classifications will not do.

The second purpose of this article is to fit the new TADV classification into a framework for representing temporal meaning: the **Two Track Theory of Time (TTT)**. The representation structures used by this theory, the so called **two track structures** or **TTSs**, will receive little attention here. They are motivated more extensively in Oversteegen & Verkuyl (1984) and Oversteegen (1986). To fit into the TTT, four categories of the quadripartition of TADVs have to be grouped somehow to form a bipartition. Each of the two axes constructing the TTSs will be connected with one of the TADV groups, the one axis being deictic (like the corresponding TADV group) - the other axis non-deictic (like the corresponding TADV group).

I will briefly sketch some semantic data that motivate TTT. They are taken from a previous article (Oversteegen (1986)) in which they are explained by TTT. It should be kept in mind that only the Dutch sentences are meant to be linguistic data. Each second line gives a verbatim English translation and each third line an English sentence, roughly corresponding in meaning to the Dutch original. There is not always a good translation available as sentence (3b) shows: the Dutch sentence would have been well-formed (as the English sentence is) if it had a simple Past instead of a Perfect in the main sentence.

- (1) a. Sanne heeft gegeten ---> Sanne at
 Sanne has eaten Sanne ate
 Sanne has eaten Sanne was eating
- b. Sanne at ---> Sanne heeft gegeten
 Sanne ate Sanne has eaten
 Sanne was eating Sanne has eaten / ate

- (2) a. Sanne heeft een peer gegeten ----> Sanne at een peer
 Sanne has a pear eaten Sanne ate a pear
 Sanne has eaten / ate a pear Sanne was eating a pear
- b. Sanne at een peer --/--> Sanne heeft een peer gegeten
 Sanne ate a pear Sanne has a pear eaten
 Sanne was eating a pear Sanne has eaten /ate a pear
- (3) a. Toen het glad was heeft ze haar been gebroken
 When it slippery was has she her leg broken
 She broke her leg when it was slippery
- b. * Toen ze haar been brak is het glad geweest
 When she her leg broke has it slippery been
 It was slippery when she broke her leg
- (4) a. ? Toen mijn dochter dat examen deed heb ik gelezen
 When my daughter that exam did have I read
 I read when my daughter did/was doing that exam
- b. Toen mijn dochter dat examen deed heb ik jouw brief gelezen
 When my daughter that exam did have I your letter read
 I read your letter when my daughter did/was doing that exam
- (5) a. Tijdens het rusten heb ik jouw brief gelezen
 During the resting have I your letter read
 I read your letter during the resting period
- b. Gedurende het rusten heb ik jouw brief gelezen
 During the resting have I your letter read
 I read your letter all through the resting period
- (6) a. Gisteren las ik (af en toe) (de hele dag)
 Yesterday read I (now and than) (the whole day)
 Yesterday I read/was reading (now and than) (all day long)
- b. Gisteren las ik jouw brief (af en toe) (de hele dag)
 Yesterday read I your letter (now and than) (the whole day)
 Yesterday I read/was reading your letter (now and than) (all day long)

Relevant questions are: how can we account for the validity of the implications (1a) and (1b) and (2a) and the non-validity of the implication in (2b)? How do we represent the events in (3a) and (3b) in such a way that their asymmetrical behaviour in perfect tensed sentences containing *toen*-subsences is explained? A similar question arises in connection with (4a) and (4b). Why is the event expressed in (5a) interpreted as occurring just once, but as occurring repeatedly in (5b)? How do we represent the events in (6a) versus (6b) in such a way that repetition (by addition of the first TADV between brackets) or extension (by the addition of the second TADV between brackets) has an accumulative effect in (6a) and an iterative effect in (6b)?

The TTSs mentioned earlier were developed in order to account for these data. They were designed to represent all kinds of semantic temporal information of a sentence. Tense, Aktionsart, TADVs and temporal conjunctions contribute their temporal information independently. Interaction between these chunks of information determine the eventual TTS.

A crucial step in TTT for all of these cases is the distinction of **durative** and **terminative events**. In the TTSs these two kinds of Aktionsart trigger different operations, resulting in sets of evaluation points (as will be demonstrated below). Consequently duratives and terminatives bear different relations to evaluation points (including the point of speech) and since **tenses** define their own evaluation point structures, interaction between tense and Aktionsart (cf. (1) and (2)) is predicted and can be accounted for. Furthermore, since temporal connectives (like **toen**) establish relations between the evaluation points of two sentences, interaction with both tense and Aktionsart is predicted (cf. (3) and (4)). Modifying TADVs affect evaluation points and so they can be expected to influence sentences with terminatives and sentences with duratives differently (cf. (5) and (6)).

To illuminate the division in two axes in TTT I would like to recall a distinction introduced by the philosopher McTaggart. He mentioned an **A-series** arranging events according to their being past, present or future. Besides the A-series he distinguished a **B-series**, ordering events with the help of the binary precedence relation. The A-series is characterized by deixis, dynamics and subjectivity. The **now** (present) of a sentence is its deictic centre and the dynamical aspect is expressed by the impermanence of the predicates past, present and future: if a proposition holds now, in the future it will be true of the past etc.

The B-series is defined as being non-deictic, static and objective: it supplies a kind of history book of all times. Once event a is ordered with respect to event b, e.g. as preceding, this relation is permanent. This ordering relation is independent of our temporal perspective, and so it is non-deictic and objective. It appears (as could be expected) that expressions with temporal meaning display either A- or B-series properties.

Several scholars have tried to reduce the two series to just one. Prior can be seen as an A-series logician. Linguistically this reduction is not an attractive one. Aktionsart, for example is to be analysed in terms of (homogeneous and non-homogeneous) change versus non-change in time. The internal development of an event or its contrast to a state is independent of its location in time (i.e. its being past, present or future). In representing Aktionsart it seems correct to abstract away from the moment of speech. B-series relations are adequate for Aktionsart.¹

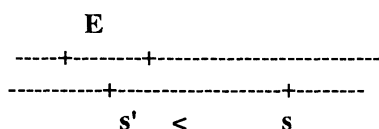
Being disturbed by the subjective character of the A-series, Russell defended the reduction of both series to the B-series. Again, a linguist could not agree with Russell. The notion of temporal deixis, expressing the position in time of the speaker with respect to the propositional content of a sentence, is essential in the analysis of e.g. tense and deictic TADVs like tomorrow. Note that a B-series semanticist would have to know on what date a sentence like

I will be there tomorrow is uttered to be able to state its truth conditions.

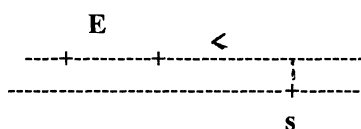
The A- and B-series have a kind of pendant in the TTSs, the representation structures of TTT. A TTS consists of a S-track with A-series properties and an E-track with B-series properties. The S in S-track stands for (point of) 'speech': the deictic centre. The E in E-track stands for 'event'. A-properties of language expressions are mapped on the S-track and B-series properties of language are mapped on the E-track.

The two tracks have different structures. The S-track is a discrete ordering. It consists of (sets of) points, representing mental positions in time as occupied by a speaker when uttering a sentence. Sometimes the speaker makes these moments explicit (e.g. by adverbial modification) - sometimes they remain implicit. Here I give the contribution of the past tenses to TTSs, in order to demonstrate which kind of semantic objects are to be found on the S-track.

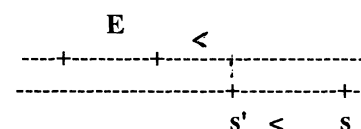
(7) a. *simple past*



(7) b. *perfect*

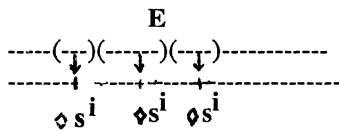
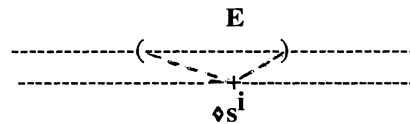


(7) c. *pluperfect*



The *s'* is reminiscent of Reichenbach's point R (point of reference) but, being a point of evaluation, its task has to be circumscribed more precisely than the task of the rather vague R ever has been. I call *s'* a 'potential speech point'. If, for (7a), Sanne at is a true expression at *s*, then Sanne eet must be a true expression at *s'*. (7b) lacks such a potential point of speech - and consequently the Perfect lacks the event-actualizing effect that has often been observed as to be a property of a simple Past tense. On the contrary: the Perfect has always been characterized as having a 'present relevance'. This characteristic is adequately represented in (7b): since Perfect lacks an *s'* the event expressed can only be evaluated retrospectively from the one available evaluation point: *s*, the present of the sentence. An additional *s'* simultaneous with *s*, would be vacuous; it amounts to saying that the point of speech is a potential point of speech. There is no complete agreement with Reichenbach here. (7c) is compositionally determined by (7a) and (7b). The actualized moment has to be some moment in the past not overlapping with the event period.

As one can conclude from the figures under (7), events are represented as intervals on the E-track. There are reasons for preferring intervals to point structures (e.g. with respect to Aktionsart distinctions) but the former do not solve every problem (cf. Tichy's criticism on interval semantics in Tichy (1985)). In assuming a representation model that has interactive point- and interval structures, I have found a way to save the advantages of intervals and yet to be sensitive to their disadvantages. This mechanism is not the point at issue here but it plays a part in the TTS contribution of Aktionsart, as is demonstrated below. The **injection** operation (8a) is triggered by a durative event while the **convergence** operation (8b) is triggered by a terminative event.

(8) a. *injection*(8) b. *convergence*

The s^i - points in (8) have to be interpreted as possible evaluation points. Some of the tenses are able to **convert** a possible evaluation point s^i into a real evaluation point, i.e. a (potential) point of speech. Such a conversion will occur in simple past and in pluperfect but not in perfect - as can be seen in (7). If tense dictates such a conversion, the set of points s^i to be converted is determined by TADVs (if present) or subsentences. I will return to this in 2.3. ²

Concluding, I would like to say that one of the main purposes of TTT is to account for semantic temporal observations in terms of an 'automatic' interaction between separately defined TTS contributions.

1.0 Possible TADV classifications

I will now turn to the real subject of this paper: temporal adverbials. It can easily be seen that these form a problem for TTSs. They cannot as a group be associated with either the S-track or with the E-track, since some TADVs are deictic and others are not. Evidently we need a TADV classification based on features determining which track the different classes should be located on. I will briefly review two classifications, one by C. Smith (1980, 1983) and the other by Kamp & Rohrer (1983), in 1.1. and 1.2. Then I will present my own proposal in 1.3.

1.1 Carlota Smith on TADVs

The central notion in the classification Smith puts down in the two articles under consideration is **capture**. If some TADV asks for or allows capture, it is dependent on a temporal point of orientation or a temporal point of reference, other than the point of speech. Given that such a point is called an **anchor**, there are in principle three categories of TADVs to be distinguished on the basis of this notion: those protected from capture (i.c. those which cannot have an anchor other than s); those available for capture (i.c. those which may have an anchor other than s); and those demanding capture (i.c. those which must have an anchor other than s). These three TADV groups are

deictic, Smith mentions right now, tomorrow, yesterday, last..., ... ago and next.... Examples of flexible anchoring TADVs are: tuesday, midnight and S(entence) and examples of dependents are beforehand, previously, the same time, afterward and subsequently. The category of deictics appears to be heterogeneous: some of the deictics are capable of anchoring at some reference point. Sentence (9) is supposed to show this:

(9) John said something surprising at noon. Mary had resigned an hour ago

This dichotomy within the deictics, resulting in a group of 'rigids', e.g. right now, tomorrow and yesterday and a group of 'permissives', e.g. last..., ...ago and next..., gives rise to a few remarks. The first concerning the concept of deixis. 'Deictic' no longer means 'necessarily interpreted with respect to the situation (e.g. time) of speech' (as it could not be in (9)). It seems to have a different meaning for different TADV groups.

As a consequence of the first point, there is a diffusion of the permissive deictics and the flexible anchoring TADVs. The original criterion distinguishing deictics and flexible anchoring TADVs stated that only the latter can appear as the rightmost TADV in the schema (10). In other words: a flexible anchoring TADV can, but a deictic TADV can never anchor to an other TADV. This criterion has clearly been dropped.

(10) TADV ----(capture)-----> TADV

Thus we are stuck with two categories without being able to properly discriminate their members. Both are 'anaphors' under the definition used by Smith (a definition coming from Hankamer (1976)). Anyway, Smith implicitly suggests four categories are needed- and in this I agree. The realization of the four categories will be somewhat different in my proposal. Furthermore, in my view the TADVs belonging to the category flexible anchoring are not dependent or captured by anything but pragmatic principles.

1.2 *Kamp & Rohrer on TADVs*

Kamp & Rohrer (K&R) distinguish five categories of TADVs. One category is irrelevant here, another category is empty. Two categories are in a way flexible anchoring: they can anchor either at a reference point or at the point of speech. The last category consists of the typical anaphors.

Interestingly, the empty category is the category of 'real deictics'. Here is an example of the kind that convinced K&R that temporal deictics do not exist.

- (11) H.C. ne fit qu'une rapide toilette du soir. Le sommeil le terrassa à peine eut-il éteint la petite lampe de la table (H.C only washed quickly for the night. Sleep overcame him when he had only just extinguished the little) de nuit, mais il sursauta encore une fois en se souvenant que quelqu'un était mort avant-hier dans son lit (lamp on the night table, but he jumped up again remembering someone had died in his bed the day before yesterday)

I cannot deny the fact that deictics can be and in fact are used in this way, but I would like to defend the claim that (11) displays a derived use of avant-hier ('the day before yesterday'). Since neither Smith nor K&R have provided a sound criterion for deixis, I will make a proposal for such a criterion in section 1.3. In their classification TADVs like hier ('yesterday'), au jour d'hui ('today') and demain ('tomorrow') (category (1)), come out as a kind of flexible anchoring TADVs (not meaning Smith's category of flexible anchoring TADVs!) : they can anchor at a (Reichenbachian) point R or at S. But so are the members of another category (2) of K&R's: maintenant ('now'), dans deux heures ('in two hours'), jusqu'ici ('until now') and en ce moment ('at this/that moment') have exactly the same anchoring potential. I don't see clearly what properties make these TADVs into one category. It cannot be the fact that maintenant ('now') combines badly with perfect tense, since the other TADVs of this category do combine with perfect. The only sharp difference between the categories (1) and (2) appears to be an asymmetry: if a member of category (1) can occur in a certain context, it can always be replaced by a member of category (2) , but the opposite is not always the case.

Category (3) in K&R's classification is formed by the 'typically anaphoric' TADVs: deux jours après ('two days afterward'), un an plus tard ('a year later'), à ce moment ('at this/that moment') and alors ('then'). These seem to have a lot in common with Smith's dependents. They can be distinguished from the previous category with the help of context (12):

- (12) Kissinger arriva au Caire le 6 juillet. TADV il partit pour Jerusalem

A suitable member of category three, but not one of category two, can replace TADV here. This is due to the temporal perspective expressed by the passé simple.

Clearly a kind of 'clock & calendar' category is missing (as Hinrichs (1981) remarks). But in fact there is a good reason for this omission: K&R announce their classification as one of 'indexical and anaphorical expressions'. By bypassing the category Smith called flexible anchoring, K&R seem to share the opinion I expressed earlier: TADVs like on the first of July, on Monday, in 1987 or after the meeting are neither deictic nor anaphoric.

To summarize, I have two objections to this classification. The first one is the absence of a deictic category and the second one is the vague distinction between the two R and S anchoring categories (if there is any). With the changes I propose (the addition of two TADV categories and the fusion of two other categories into one) the K&R classification would consist of four categories, as would the revised Smith classification. I will now turn to the quadripartition that I propose. I would like the paragraphs on Smith and on Kamp and Rohrer to be judged as

supplying indirect motivation for my classification. Their arguments are weak or absent precisely on the points where the above classifications deviate from the proposal below.

1.3 A TADV classification within the TTT framework

Two 'features' will be useful in simplifying the oppositions between the four TADV categories. The first is the expression of the deictic or non-deictic character of the TADV category in question: temporal deixis means orientation on *s*, the point of speech. Therefore I will use [+s] and [-s] to indicate whether a TADV can anchor at *s*. Pure deictics will obviously be [+s] - but we also need a way to express that they can **only** have a meaning relative to *s*. By introducing a second feature, [αt_x], we can express the possibility or impossibility for some TADV of anchoring at a variable moment in time t_x , where t_x is a moment other than *s*. These features are to be understood in the following manner: [+s] and [$+t_x$] respectively mean: **can** anchor to *s* and **can** anchor to t_x . Except in case the second feature has a negative value; in that case it means: **must** anchor to *s* and to t_x respectively.

By introducing two features with each two possible values, we create the logical possibility of four TADV categories³. Below I will sum up a variety of Dutch TADVs. You will find a large number of them twice because the left side contains those TADVs that can be interpreted as denoting a time point/period preceding *s* and the right side contains those TADVs that can be interpreted as denoting a time point/period following *s* and some TADVs can have it both ways. The easiest way to check this potential is to combine the TADV with simple past and (futural)present tense respectively. In some cases, like het afgelopen weekend ('last weekend') another context, like (13) below, will be needed to bring out the true anchoring behaviour

- (13) Met Kerst zal Petra het afgelopen weekend net op bezoek zijn geweest
At Christmas will Petra the last weekend just on visit have been (lit.)

The interpretation of the TADV in (13) can be some weekend after *S* and thus this TADV will occur both under (14)I and (14)II.

(14)I	<S	(14)II	>S
	spoedig ('soon')		spoedig ('soon')
	met Pasen ('at Easter')		met Pasen ('at Easter')
	een week erna ('a week afterwards')		een week erna ('a week afterwards')
	een week ervoor ('a week before')		een week ervoor ('a week before')
	op maandag ('on Monday')		op maandag ('on Monday')
	(op) de volgende x ('(on) the next x')		(op) de volgende x ('(on) the next x')
	(de) vorige x ('(the) last x')		volgende x ('next x')
	afgelopen zondag ('last Sunday')		komende zondag ('next Sunday')
	het afgelopen weekend ('the past weekend')		het afgelopen weekend ('the past weekend')

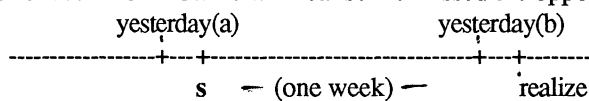
het komende weekend ('the next weekend')	het komende weekend ('the next weekend')
laatst ('lately')	binnenkort ('shortly')
een x geleden ('an x ago')	een x geleden ('an x ago')
over een x ('in an x')	over een x ('in an x')
binnen een x ('within an x')	binnen een x ('within an x')
laatstleden x ('last x')	aanstaande x ('next x')
gisteren ('yesterday')	morgen ('tomorrow')
eergisteren ('the day before yesterday')	overmorgen ('the day after tomorrow')
(op) 23 februari ('(on) the 23th of february')	(op) 23 februari ('(on) the 23th of February')
na een x ('after an x')	na een x ('after an x')
na de vergadering ('after the meeting')	na de vergadering ('after the meeting')

Some NP indicating a temporal unit, like week, day or hour may be substituted for the x-s used in (14) ⁴.

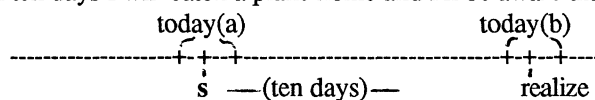
Since temporal deixis implies interpretation with respect to the moment of speech, the referent of a deictic TADV - whether a point or an interval - must bear the same relation to s in every context. This relation may be <, >, inclusion or identity. (A complication for inclusion is that in this case the TADV interval may consist of a part before s and a part after s, and so the < relation between the referent of this kind of TADV and s is not constant: in different contexts different parts of the interval are relevant). Consequently, a TADV which in one sentence has a referent consisting in a point or interval on the right hand side of s, and in another a referent on the left hand side of s, cannot be deictic (save in case of an inclusion relation with s). If two such contexts can not be found, the TADV is called deictic.

If my conservative attitude towards the 'traditional' category of temporal deictics is right, it should be hard to find pairs of contexts as described above for TADVs like yesterday, today and tomorrow. Now consider the following sentences with their accompanying figures.

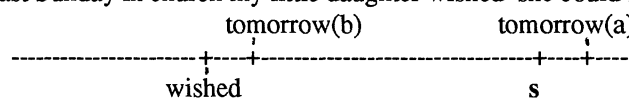
- (15) a. One week from now he will realise he missed the opportunity to see his wife yesterday



- b. In ten days I will catch a plane home and I'll be aware that today is a very special day



- c. Last Sunday in church my little daughter wished she could stay at home tomorrow



The TADVs on the (a)-positions bear the 'normal' relations to s - the TADVs on the (b)-positions don't and the corresponding interpretations are awkward in my opinion. They are better if a verb like tell or say is used instead of realise, be aware and wish. This can be explained by pointing out that there is evidently a report of a speech

situation if tell or say is used and this speech situation will implicitly have its own point of speech. With respect to this point we can interpret pure deictics, in a kind of derived usage ('Erlebte Rede'). This possibility of a derived usage, restricted to a specific set of verbs, can be no reason for dropping the category of deictics altogether, as Kamp and Rohrer do. We now have a strategy at our disposal for isolating the category [+s, -t_x] from the categories [+s, +t_x], [-s, +t_x] and [-s, -t_x], since a TADV occurring in both columns must either be non-deictic, [-s], or anaphoric, which amounts to being [+t_x].

The [-s, -t_x] category can be extracted relatively easily from the remaining TADVs. They express a temporal relation in which one of the relata is the event the sentence is about and the other relatum is more or less independent of temporal reference points. For example the denotation of Monday in on Monday he lost his dog does not depend on s the way yesterday does - though the set of possible denotations certainly is limited by the use of the past tense. But being limited by tense or being dependent on some temporal reference point seems to be quite a different thing. In case of doubt, sentences like the following may succeed in demonstrating that the interpretation of Monday as 'on last Monday', is a matter of pragmatics: Last year New Year's Eve was on (a) Sunday and on Monday we went for a walk. In fact on Monday can refer to any monday without needing a point of orientation for its interpretation like for example a week before does.

The remaining TADVs will be either [+s, +t_x] or [-s, +t_x]. In other words, members of both categories have the capacity to be interpreted anaphorically, but only the former can be interpreted as being dependent on s. This can easily be checked: compare (16) a and b.

- (16) a. Harald komt na een week
 Harald will come after a week
 b. Harald komt binnen een week
 Harald will come within a week

Only (16)b allows the interpretation 'one week from now' - for (16)a some other reference point is obligatory.

Now that we are equipped with the necessary criteria the classification can be made. Each of the four categories can be compared with Smith, Kamp and Rohrer. My category A: [+s, -t_x] corresponds to Smith's rigid deictics and the category which K&R wish to proclaim empty. Category B: [+s, +t_x] is matched by Smith's permissive deictics and a fusion of K&R's category 1 and 2. Category C: [-s, +t_x] corresponds to Smith's dependents and K&R's typically anaphoric TADVs, and finally my category D: [-s, -t_x] is called flexible anchoring in Smith's classification and, due to its non-indexical, non-anaphoric nature is missing in K&R's classification. It should be noted that, although the members of these categories in the different classifications may be alike, the ideas behind them are different. I will turn to the four lists that the criteria result in.

A: [+s, -t_x]
 volgende x
 vorige x
 laatstleden x
 laatst
 binnenkort
 gisteren
 morgen
 komende zondag
 aanstaande x
 afgelopen zondag

B[+s, +t_x]
 de volgende x
 de vorige x
 op de volgende x
 het komende weekend
 in het komende weekend
 het afgelopen weekend
 in het afgelopen weekend
 recentelijk
 over een x
 binnen een x
 een x geleden

C: [-s, +t_x]
 een week ervoor
 binnen een week ervoor
 een week erna
 binnen een week erna
 een x later
 een x eerder
 (op) de voorafgaande x
 na een x

D: [-s, -t_x]
 na de vergadering
 op maandag
 op 23 februari
 in 1984
 met pasen
 sinds Kerstmis
 op 2-3-1965

With respect to these four rows, an interesting phenomenon turns up when a definite article is added to certain members of category A: they shift to category B.

It should be remarked that Dutch maandag ('Monday') is often used without preposition. But this is a more or less deictic usage: not just 'a' Monday is meant but the most recent or next coming Monday. This is a kind of deixis slightly differing from the definition given above. However there is an interesting connection between category A and category D: both being [-t_x], the feature [+/-s] varies with the absence, resp. presence of a preposition.

2.0 *The properties of the of the four classes - a bipartition*

Now that four classes have been distinguished, they can be expected to behave differently in certain contexts - according to their specific properties. In paragraph 2.1 I will give a few examples of such contexts. It will become clear that, though there evidently are four different TADV categories, in some important respects they fall into two groups. Paragraph 2.2 concerns the relation between syntax and semantics of TADVs. A tentative account is given of the relation of the semantic TADV classification and the rather refined syntactic framework called **Government and Binding** (Chomsky (1981) e.a.) In paragraph 2.3 I will make a few predictions that should come out correctly if the bipartition given in 2.1. is a crucial one with respect to TTT. These predictions concern the interaction between

TADV's and tense and TADV's and Aktionsart.

2.1 Some interesting contexts

There are differences in the behaviour of the TADV categories in so called **precede** and **command** configurations. To my knowledge Lasnik (1976) was the first to use the notion precede and command (henceforth P&C). An element *a* stands in a P&C relation to an element *b* if it is both true that *a* precedes *b* and that *a* C-commands *b*.⁵ Smith applied this notion, developed for anaphora, to temporal 'anaphora'. What I am interested in here is the question whether the underlined TADV can function as an anchor for the italicized TADV. If it can, we say that the italicized TADV behaves anaphorically; its interpretation is dependent on the antecedent (underlined) TADV. The antecedent TADV is no object of investigation here and I will keep it constant for all sentences: Tuesday will have to serve as a (potential) anchor.

(17) (precede & command)

A*	[+s, -t _X]	Hij realiseerde zich <u>dinsdag</u> dat hij <i>gisteren</i> ontslagen was
B	[+s, +t _X]	<i>een week terug</i>
C	[-s, +t _X]	<i>een week ervoor</i>
D	[-s, -t _X]	<i>op woensdag</i>

He realised on Tuesday that he had been fired *yesterday*
a week ago
a week before
on Wednesday

(18) (command - not precede)

A*	[+s, -t _X]	Dat hij <i>gisteren</i> ontslagen was realiseerde hij zich <u>dinsdag</u>
B	[+s, +t _X]	<i>een week terug</i>
C	[-s, +t _X]	<i>een week ervoor</i>
D	[-s, -t _X]	<i>op woensdag</i>

That he had been fired *yesterday* he realised on Tuesday
a week ago
a week before
on Wednesday

(19) (precede - not command)

A*	[+s, -t _X]	Dat hij <u>dinsdag</u> ontslagen zou worden realiseerde hij zich <i>gisteren</i>
B*	[+s, +t _X]	<i>een week terug</i>
C	[-s, +t _X]	<i>een week ervoor</i>
D	[-s, -t _X]	<i>op woensdag</i>

That he would be fired on Tuesday he realised *yesterday*
a week ago
a week before
on Wednesday

- (20) (neither precede nor command)
- | | | |
|----|------------------------|--|
| A* | [+s, -t _x] | Hij realiseerde zich <i>gisteren</i> dat hij <u>dinsdag</u> ontslagen zou worden |
| B* | [+s, +t _x] | <i>een week terug</i> |
| C? | [-s, +t _x] | <i>een week ervoor</i> |
| D | [-s, -t _x] | <i>op woensdag</i> |
- He realised *yesterday* that he would be fired on Tuesday
a week ago
a week before
on Wednesday

As we might expect, not one of the sentences containing a TADV from category A [+s, -t_x], has the anaphoric interpretation in question. It is of course a typical property of a [+t_x] TADV to anchor at a TADV like op dinsdag ('on Tuesday'); in fact it is the semantic [t_x] feature that is the object of interest here. Consequently, the sentences containing a D-TADV should receive a star on semantic grounds: they don't have the anaphoric interpretation in question. ⁶

Most interesting are the B- and C-cases: evidently they do not behave the same way, though they both carry the feature [+t_x]. Like other anaphoric relations, these temporal anaphoric relations will be determined with respect to some syntactic domain. The domain of interpretation of the feature [+t_x] is not constant, it seems. We can draw various conclusions. Not a single feature but a combination of the two features defines the domain of interpretation. Or: the domain relevant to the [+t_x] feature depends on the TADV category in some other way (e.g. another feature).

In (17)/(20) we are investigating a semantic property formalized by [+/-t_x] in several syntactic configurations. Each of the four TADV categories expresses a relation: the A-category a relation with s, the D-category with some 'event' (a certain month or year, a meeting, Christmas etc) independent of s, and only the B- and C-categories have a 'variable' relatum. Their being anaphorical implies that there is a certain aspect of meaning they have in common with their antecedent. There is no coreference: antecedent and anaphor do not have the same referent. The referent of the antecedent is one of the relata of the relation expressed by the anaphorical TADV. This is the aspect of meaning they have in common, sometimes explicitly present in the form of a morpheme, as in **een maand ervoor** (lit: 'a month before it') and sometimes implicitly as in **een week later** (than t_x) or **de (op t_x) volgende dag** (lit: the (on t_x) following day'). If a sentence contains a word like the adverbial **toen** to make t_x explicit, we would expect only the categories B and C to be able to relate to it. This seems to be correct as can be seen in (21).

- (21) Het was toen ***overmorgen** (A) dat Bernadette zou komen
het komende weekend (B)
 Het was toen **een week later** (C) dat Bernadette zou komen
? op zondag (D)
 It was then **the day after tomorrow** (A) that Bernadette would come
the next weekend (B)
one week later (C)
on Sunday (D)

However, even if we abandon the semantically motivated asterisk for the D-category in (20), there appears to be support for the quadripartition from the syntactic distributional sphere, as (22) shows.

(22)		A	B	C	D
		[+s, -t _x]	[+s, +t _x]	[-s, +t _x]	[-s, -t _x]
	P & C	*			
	~P & C	*			
	P & ~C	*	*		
	~P & ~C	*	*	?	

I will now survey the possible TADV combinations: in (23) all logically possible combinations of two TADV categories are tried out. In fact there is a duplication : in (23a) the duration of the first TADV is less than the duration of the second TADV while in (23b) it is the other way around (noot 2). Duration should be no bias factor.

In (24) a and b the results are represented in a schema.

(23)a.	AA *	Gisteren verleden week...	('yesterday last week')
	AB +	Gisteren een week geleden...	('yesterday a week ago')
	AC *	Gisteren de week ervoor....	('yesterday the week beforehand')
	AD *	Gisteren op 23 februari...	('yesterday on the 23 rd of february')
	BA *	De vorige zondag verleden week...	('last sunday last week')
	BB +	De vorige zondag een week geleden...	('last sunday a week ago')
	BC *	De vorige zondag de week ervoor...	('last sunday the week beforehand')
	BD *	De vorige zondag op 23 februari...	('last sunday on the 23 rd of February")
	CA *	De dag tevoren verleden week....	('the day before last week')
	CB +	De dag tevoren een week geleden....	('the day before a week ago')
	CC *	De dag tevoren de week ervoor....	('the day before the week before')
	CD *	De dag tevoren op 23 februari...	('the day before on the 23 rd of February')
	DA *	Op 23 februari verleden week....	('on the 23 rd of February last week')
	DB +	Op 23 februari een week geleden...	('on the 23 rd of February a week ago')
	DC *	Op 23 februari de week ervoor...	('on the 23 rd of February the week before')
	DD ?	Op 23 maart in de week voor Pasen...	('on the 23 rd of March in the week before Easter')
(23) b.	AA *	Verleden jaar gisteren...	('last year yesterday')
	AB *	Verleden jaar een week geleden...	('last year a week ago')
	AC @	Verleden jaar de week ervoor...	('last year the week before')
	AD @	Verleden jaar op 23 februari...	('last year on the 23 rd of February')
	BA *	Het afgelopen jaar gisteren...	(' last year yesterday')
	BB *	Het afgelopen jaar een week geleden...	(' last year a week ago')

BC @	Het afgelopen jaar de week ervoor...	('last year the week beforehand')
BD @	Het afgelopen jaar op 23 februari...	('last year on the 23 th of February')
CA *	Het jaar ervoor gisteren...	('the year before yesterday')
CB *	Het jaar ervoor een week geleden...	('the year before a week ago')
CC ?	Het jaar ervoor de week ervoor...	('the year before the week before')
CD @	Het jaar ervoor op 23 februari....	('the year before on the 23 rd of February')
DA *	In 1979 gisteren....	('in 1979 yesterday')
DB *	In 1979 een week geleden...	('in 1979 a week ago')
DC @	In 1979 de week ervoor....	('in 1979 the week before')
DD @	In 1979 op 23 februari...	('in 1979 on the 23 rd of February')

		[+s, -t _x]	[+s, +t _x]	[-s, +t _x]	[-s, -t _x]
(24) a.		A	B	C	D
	[+s, -t _x]	A *	B +	C *	D *
	[+s, +t _x]	B *	B +	C *	D *
	[-s, +t _x]	C *	B +	C *	D *
	[-s, -t _x]	D *	B +	C *	D ?
b.	[+s, -t _x]	A *	B * (1)	C @ (2)	D @
	[+s, +t _x]	B *	B * (1)	C @ (2)	D @
	[-s, +t _x]	C *	B * (1)	C ?	D @
	[-s, -t _x]	D *	B * (1)	C @ (2)	D @

The symbols used in (24) are meant as follows: '*' means unacceptable, '+' means that the referents of the separate TADV's add up the way vectors add up to a resultant, '@' means that the second TADV is a specification with respect to the first TADV and '?' has its usual meaning.

The numbers between brackets are meant to indicate that some anchor for the second TADV other than the time denoted by the first TADV is implied. In the [+s, +t_x] column a (1) appears. This is used to indicate that, though the TADV combinations are not acceptable, they can be interpreted if a special point is assumed as an anchor. This point is a copy of s; the combinations are then interpreted as follows: 'het afgelopen jaar **op dit moment** een week geleden' ('last year **at this time** a week ago') and: 'in 1979 **op dit moment** een week geleden' ('in 1979 **at this time** a week ago').

The (2) in the third column is used to indicate that an external anchor, not expressed by the TADV group, is assumed. Speaking about easter, for example, we can say: 'het afgelopen jaar de week ervoor' ('last year the week before (it)') or 'in 1979 de week ervoor' ('in 1979 the week before (it)').

A lot of hypotheses and remarks can be made in connection with the results in (24). Not all of them are equally relevant here; I will mention a few.

- A [+s] TADV can only occur as a second TADV if it is [+t_x] or in other words: no pure deictics as second TADVs.

- A [-s, -t_x] TADV can only occur as a second TADV to specify the time denoted by the first one. Therefore we will only find acceptable TADV combinations with D as a second TADV in (24b) where TADV₁ > TADV₂. (By TADV₁ > TADV₂ I mean to say that the referent of TADV₁ is longer lasting than the referent of TADV₂ as is the case in all the (23b) sentences. The interval corresponding to TADV₁ is longer than the interval corresponding to TADV₂ and the latter is more precise (cf. also Enc (1981, pp.145,146)). The opposite is meant by TADV₁ < TADV₂; see all (23a) sentences).

- It might be expected that a [+t_x] TADV can always occur as a second TADV. This does not appear to be the case: if TADV₁ < TADV₂ it does not prove right for [-s, +t_x] and if TADV₁ > TADV₂ both [+s, +t_x] and [-s, +t_x] use some anchor other than the one supplied by TADV₁. For a [+s, +t_x] TADV this anchor is derived from s. For a [-s, +t_x] TADV it is not expressed by the TADV group - in fact not even by the simple sentence in which this TADV group appears. In the simple sentence 'Het afgelopen jaar de week ervoor was hij erg nerveus' ('last year the week before (it) was he very nervous') the anchor is supposed to be supplied by the context. If we choose a nondurational first TADV, the difference between +s and -s becomes even clearer. In view of (25a) below, a [+s, -t_x] TADV is acceptable as a second TADV but a [-s, +t_x] TADV is not (cf. (25b)).⁷

- (25) a. Een jaar geleden een week terug...('a year ago before one week')
 b. *Een jaar geleden een week ervoor... ('a year ago one week before (it)')

Evidently the anchor supplied by TADV₁ can be used by a TADV from category B, but not by a TADV from category C. Once again there appears to be a difference between the syntactic domains in which B and C obtain their anchors: for [+s, +t_x] this can be a simple sentence but not so for [-s, +t_x]. In this respect, the [+/-s] must be crucial.

The question marks in (24) can be explained rather easily. The ? accompanying the DD combination indicates that this combination will sometimes be acceptable and sometimes not - it is a matter of real world knowledge. For example: 'op 23 februari in 1979' and 'met pasen in 1979' ('at Easter in 1979') are correct while 'op 10 december de week voor pasen' ('on the 10th of December the week before Easter') is not. The question mark for the CC combination is due to the difficulty in interpreting two TADVs with two different and unexpressed anchors, to be specified by context.

I will conclude this section by remarking that each of the four TADV categories again displays a different behaviour and that it can be seen from (24) that category A and B have traits in common, just as C and D have. In other words: the [+/-s] feature is of importance.

In yet another context the A and B categories can be contrasted with the C and D categories. Consider the sentences (26) below.

- (26) A *Verleden week te komen leek haar het beste
 Last week to come seemed her the best
 She thought it best to come last week
- B ? Een week geleden te komen leek haar het beste
 A week ago to come seemed her the best
 She thought it best to come a week ago
- C Een week eerder te komen leek haar het beste
 A week earlier to come seemed her the best
 She thought it best to come a week earlier
- D Zondag 23 februari te komen leek haar het beste
 Sunday 23 februari to come seemed her the best
 She thought it best to come on Sunday the 23rd of February

There seems to be a problem when the TADVs in (26) A and B, pointing backward in time, occur in a tenseless clause. Their being [+s] seems to be crucial, since categories C and D are both perfectly all right. The slightly futurate meaning in the tenseless clause might clash with the [+s] backward pointing TADVs; if a forward pointing TADV is chosen there is no such clash: 'Morgen / over een week te komen leek haar het beste' ('It seemed best to her to come tomorrow / in a week '). Not attempting an exact analysis of the problem here, I give this context as an other indication that the [+/-s] feature plays a role of importance in several constructions.

By now it will be clear that the bipartition of TADVs needed with respect to the TTs, the representation structures, will be based on the value of the [s] feature. It could hardly be surprising, given the character of the S-track, that the [+s] TADVs are located here - nor that the [-s] TADVs are represented on the E-track, which is non-deictic. But I needed the support of the previous contexts to demonstrate the importance of the [s] value in the interaction of TADVs with each other and with other phenomena.

A crucial assumption in TTT with respect to TADVs is that they function as specifiers of evaluation points (see also the *Introduction*). They specify the $\diamond s^i$ points and consequently they interact with Aktionsart (see paragraph 0, figure (7)). They determine the set of $\diamond s^i$ points to be converted to s' points if tense dictates conversion and thus TADVs interact with tense. In 2.3 I will give some evidence in favour of the proposed TADV classification in the form of successful predictions arising from the interaction between tense, Aktionsart and TADVs in the TTs. I will now sketch a possible connection between the TADV classification and the theory of government and binding. This paragraph can be skipped without causing trouble in understanding paragraph 2.3. by those readers who are not interested in the government and binding framework.

2.2 TADVs and the theory of Government and Binding

Adverbial phrases have not always been a popular subject in syntactic theory. The reason Huang (1975) offers for

this unpopularity is their messyness: they do not fit into any syntactic X-bar-category. Most linguists analysing temporal adverbial phrases do not subdivide them in terms of syntactic position (v.d. Hoek (1971), Huang (1975), Janssen (1985)). Recently two articles appeared on bare NP adverbs which make use of the theory of government and binding: Larson (1985) and Kerstens (to appear in *De Nieuwe Taalgids*). Since there is a considerable overlap with TADVs, these articles are of much interest here. Both authors conclude that bare NPs do not have a governing category, that they do not receive case but are able to assign case to themselves, and that they can freely occur at many different places in a sentence.

Chomsky (1981) makes a quadripartition of NPs based on two features: [+/-a], with 'a' for anaphorical; and [+/-p] with 'p' for pronominal. The four logically possible feature combinations are realized as follows: [+a, -p] are anaphors (and NP-traces), [-a, +p] are pronouns (and empty pro-elements) and [-a, -p] are the so called R-expressions, which Chomsky calls "potential referential in some intuitive sense" (and variables). The [+a, +p] combination corresponds only with an empty NP: PRO. The features place conditions on the binding behaviour of the NPs with respect to a specific domain. An anaphor [+a] is bound in its governing category.⁸ A pronominal [+p] is free in its governing category, and R-expressions, [-a, -p], are free. A [+a, +p] NP hasn't got any governing category (the so called "PRO theorem" - see Manzini (1983) for a discussion).

Kerstens (1986) generalizes this feature schema with its domain restricting implications to Theta theory: he suggests that both the binding system and the theta system are instantiations of a more general NP schema:

- (27) I NP's are characterized by the features [+/-d] and [+/-i] with d for dependent and i for independent (w.r.t. a certain domain)
- II a [+d] NP is dependent in its governing category
 a [+i] NP is dependent outside its governing category
 other NPs are independent

For the Theta system, the notion '(un)governed' should replace '(in)dependent'; a [+g] NP, for example, is governed in its governing category. Again we have four categories provided by the two binary oppositions [+/-g] and [+/-u]. The category of bare NP adverbials corresponds with the feature combination [+g, +u]. That is to say, such an NP is governed both within and outside its governing category. But since it is no argument to a category, a bare NP adverbial has no governing category (see Chomsky, 1981). Thus the syntactic position of a NP TADV (a bare NP adverbium) is almost completely free.

Though an extension of this sophisticated syntactic theory to TADVs is to be welcomed, the previous sections of this article are not in agreement with Kerstens option. If the entire TADV category (or to be precise: that of the NP TADVs) has an arbitrary syntactic position and is insensitive to structural notions (like governing category) it is

not clear how the distinct TADV groups could have a regular pattern of anaphoric behaviour in several contexts. Like the above NP distributions, for NP TADVs there seem to be different syntactic domains of (anaphoric) interpretation. I will summarize the restrictions that the TADV categories appeared to put on their domains.

- [+s, -t_x]: an A-TADV, depends in any position upon (the INFL (tense) node of) the highest S (cf (17) / (20), (21),(24)). It never has an anaphorical interpretation.
- [+s, +t_x]: a B-TADV, may find an antecedent within S. If it is a simple S and the antecedent is supplied by another TADV, in general a B-TADV can be interpreted as being anaphoric. If it is a complex sentence the B-TADV can obtain an anaphorical interpretation if it is c-commanded by its antecedent.
- [-s, +t_x]: a C-TADV, doesn't find its antecedent in a simple S (cf (24)). In a complex sentence a B-TADV can have an anaphorical interpretation, (almost) irrespective of its syntactic position with respect to its antecedent. A C-TADV must be anaphorical and thus needs an antecedent.
- [-s, -t_x]: a D-TADV, will never be interpreted anaphorically - neither within a simple S nor within a complex S.

The semantically motivated feature combinations of [+/- s] and [+/- t_x] appear to define a syntactic domain just as the features [+/-i] and [+/-d] do; it does not seem far fetched to suppose the TADV classification to be an instantiation of Kersten's NP schema as well. If, for the time being, we accept this hypothesis, we must acknowledge the inadequacy of the notions 'governing' and 'governing category' that play a role in both binding and theta theory. Since a TADV has no argument status, it has no governing category and so this can not be the syntactic notion needed to define the syntactic domains in which the distinct TADV categories can be interpreted anaphorically.

I see two ways out. Firstly we may take the A-TADVs to be the only TADVs relevant to the NP schema. The A-TADVs form the most homogeneous group with respect to syntactic category: the greater part belongs to the NP category. B-TADVs and C-TADVs are much more messy: they may be NPs, PPs or ADVPs. D-TADVs all seem to be PPs (and, partly, distributively complementary with the A-TADVs). Because only the A-TADVs are both arbitrary in their syntactic position (because they have no anaphorical interpretation) and of the NP category (mostly), they are the most straightforward candidates for the bare NP TADVs that Larson and Kerstens speak of. Assuming that only A-TADVs fit into a schema like (27) certainly is the soft option. It can be defended though, since it seems to be awkward to generalise syntactically over three different categories, PP, NP and ADV, in constructing a quadripartition with respect to syntactic domains that allow anaphorical interpretation. But in fact X-bar theory strives after exactly such generalisations.

I am inclined to choose an alternative continuation. This implies the claim that all TADV groups mentioned should be ruled by some government or binding system. The notion I need to define syntactic domains could not be governing category for reasons mentioned before. But Manzini (1983) proposes a related notion in her treatment of PRO NPs; a revision of Chomsky (1981). She defines "domain governing category" as :

- (28) β is a domain governing category for α iff
 β is a governing category for the c-domain of α and
 β contains a subject accessible to β

Under most analyses, the VP would determine the c-(command) domain of the TADV. That makes the first S-node dominating the VP the domain governing category. Thus the summary of syntactic restrictions above can now be stated as follows:

- A-TADVs [+s, -t_x], are bound neither within their domain governing category nor outside their domain governing category. They depend on the highest S (or INFL) node for their interpretation.
- B-TADVs [+s, +t_x], are bound within or outside their domain governing category. If they are bound outside their domain governing category, the extra restriction that the antecedent should command the TADV is taken care of: the notion 'binding' implies c-command.⁹
- C-TADVs [-s, +t_x] are bound outside their domain governing categories (note x+1).
- D-TADVs [-s, -t_x] are completely free.

This is a tentative formulation. I am aware that I am neglecting here certain internal syntactic regularities of the different TADV groups. In future work syntactic structure and domain of the TADVs will be described in greater detail (Oversteegen, to appear). In this section I only wanted to sketch a perspective.

2.3 *Interaction between TADVs, Tense and Aktionsart*

I will return to the semantic bipartition that made it possible to associate the one TADV group with the S-axis and the other with the E-axis, thus incorporating the entire category of TADVs in the TTSs.

Bipartition: [+s, +/- t_x] on the S-track
 [-s, +/- t_x] on the E-track.

If this is correct we must expect interaction within the TTSs. On the one hand between TADVs and Aktionsart, since the S-track TADVs specify the ϕs^i points - the images of one of the two Aktionsart operations - and the E-track TADVs have no direct relation with ϕs^i points. On the other hand between TADVs and tense, since the ϕs^i points, specified by the S-track TADVs - but not by the E-track TADVs - can be part of the tense structure. They are if conversion has taken place - which depends on the choice of tense. I will first give examples of the latter interaction. The TADVs on the S-track, in other words the [+s] TADVs, may be expected to force a tense choice. Since the TADVs in question specify the ϕs^i points that may result in s' points after conversion, and tense defines the relation between s and s' points, it seems logical that the [+s] TADVs bear an effect on tense. This is not

predicted with respect to [-s] TADV's. The examples under (29) seem to confirm the prediction: [+s, -t_x] and [+s, +t_x] bring about a forced tense choice while [-s, +t_x] and [-s, -t_x] do not. ¹⁰

- (29) A: *(Marij zal overmorgen beweren dat) Joan morgen thuiskwam
 (Marij wil the day after tomorrow say that) Joan tomorrow home came
 (Marij will say the day after tomorrow that) Joan came home tomorrow
 B: * (" ") Joan over een week / een paar uur thuiskwam
 (" ") Joan came home in a week / a few hours
 C: (" ") Joan een week / een paar uur later thuiskwam
 (" ") Joan came home a week / a few hours later
 D: (" ") Joan 23 maart thuiskwam
 (" ") Joan came home on the 23rd of March

The simple past in the subsentences of (29) depends on the speechpoint determined by beweren ('say') in the main sentence at overmorgen ('the day after tomorrow'). Thus there is 'temporal space' between both points of speech for the s' determined by kwam ('came') and specified by the subsentence TADV. One might conjecture that (29) A and B are ungrammatical because [+s] TADV's will anchor at the speechpoint implied in the subsentence; (30a) and (30b) are meant to demonstrate this is not the case.

- (30) a. (Marij zal morgen beweren dat) Joan overmorgen thuis zal/zou komen
 (Marij will say tomorrow that) Joan will/would come home the day after tomorrow
 b. (" ") Joan over een week thuis zal/zou komen
 (" ") Joan will/would come home in a week

For another example of interaction, see (31) and (32). In simple past sentences the points sⁱ, specified by a [+s] TADV if present, are converted to points s'. The TADV in (31a) specifies a whole series of points sⁱ and thus brings about a durational interpretation of the event, evaluated by the s' points. There is no conversion in (31b) (due to the perfect used here) and consequently the relation between the TADV and the event is much weaker. The possible evaluation points specified by TADV never obtain the status of real evaluation points. In (31b) the durational interpretation is not preferred.

- (31) a. Afgelopen maand was Michael hier
 Last month was Michael here
 Michael spent last month here.
 b. Afgelopen maand is Michael hier geweest
 Last month has Michael here been
 Michael was here last month.

If we chose a [-s] TADV we would not expect the durational interpretation; even if there is conversion like in (32a), the TADV is not supposed to specify the sⁱ points (so neither the s' points). There appears to be no real

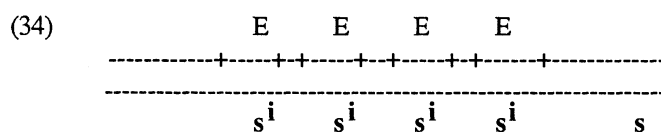
difference between (32a) and (32b) (which is partly due to the preposition, characteristic for a D-category TADV). This is in harmony with TTT .

- (32) a. In augustus/ op 23 maart was Michael hier
 In August/ on 23 March was Michael here
 Michael was here in August/ on the 23rd of March
 b. In augustus/ op 23 maart is Michael hier geweest
 In August/ on 23 March has Michael here been
 Michael was here in August/ on the 23rd of March

The next and final example is about the interaction between TADVs and Aktionsart. Consider the sentences (6a) and (6b) of the *Introduction* paragraph, repeated here as (33a) and (33b).

- (33) a. Gisteren las ik (af en toe) (de hele dag)
 Yesterday read I (now and then) (the whole day)
 Yesterday I read/was reading (now and then) (all day long)
 b. Gisteren las ik jouw brief (af en toe) (de hele dag)
 Yesterday read I your letter (now and then) (the whole day)
 Yesterday I read/was reading your letter (now and then) (all day long)

In these cases a [+s] TADV specifies a whole set of s^i points. This set is smaller and interrupted for (gisteren) af en toe ('(yesterday) now and then'), and larger and more or less continuous for (gisteren) de hele dag ('(yesterday) all day long'). If the Aktionsart of the sentence is a durative, as is the case in (33a), the set of s^i points is provided by the injection operation on E (see (8a)). But if the Aktionsart of the sentence is terminative, as is the case in (33b), only one s^i point is provided, as an image of the convergence operation (see (8b)). So, if TADV specifies a set of s^i points, as the TADVs in (33) do, in a terminative sentence the s^i points are multiplied. As a consequence their originals, the E-intervals, will have to be multiplied. In (34) below the TTS corresponding to (33b) is designed.



The points s^i in (34) will be converted into points s' in simple past sentences (like (33b)). But as (34) shows, also the corresponding sentence in perfect is expected to have an iterative interpretation. And this seems to be correct.

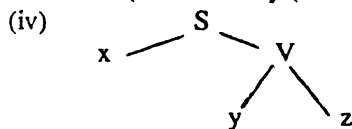
Though I am aware that part of the previous does not have the quality of hard evidence, I think the TTT framework is promising; a lot of predictions can be made on the interaction of all kinds of elements in a sentence that express temporal meaning. A more exact formulation of TTS contributions is called for.

Notes

1. I am aware of the development (e.g. in the work of Kamp (1981) and Dowty (1983) to make the interpretation of 'events' and 'states' dependent on the tense of the sentence. I do acknowledge the influence tense may have on Aktionsart, but Aktionsart should be seen as a sentential property in its own right. To substantiate this claim I have demonstrated (in Oversteegen (1986)) that the two Aktionsarten terminative and durative, and the two tenses simple past and perfect form four separate cases - not two, as would be the case if tense determined Aktionsart.
2. In general, the TADV specifies the 'domain' of the ϕs^i points. For a sentence like *Gisteren regende het* ('yesterday it was raining') we might imagine the conversion as follows: $\forall \phi s^i < \text{een dag } s : \phi s^i \rightarrow s' .$ If the sentence, like the above sentence, contains a durative, there may be ϕs^i points (images of an injection) covering all of *gisteren* ('yesterday') (see (i) below). They may cover part of *gisteren* (see (ii) below). Usually in Dutch perfect tense is used in this case. If the sentence contains a terminative, like in *Gisteren kwam ik Sarah tegen* ('yesterday I met Sarah'), there will only be one ϕs^i as the image of a convergence, and likewise only one (converted) evaluation point (see (iii) below).



3. The attentive reader will have noticed that it is not strictly spoken a logical quadripartition: if [+s] means 'can anchor to s' -as it does in the combination [+s, +t_x], it would be possible for a [+s, -t_x] TADV not to anchor at all. In fact it must anchor to s. Likewise, [-s, +t_x] would not exclude a non-anchoring TADV, while in fact there must be an anchor in the context. Thus we need an additional rule like: [+a] means can anchor to a, unless the value of the second feature is [-b], for then it must anchor to a.
4. The structures of *een vergadering later* ('a meeting later') and *een week later* seem to be different. The former has an N-head structure and the latter an ADV-head . A preposition can easily be combined with the former but not with the latter - unless in *een week later* means: in some week (which happens to be later). *Een vergadering later* can have an ADV-head structure: the *vergadering* ('meeting') is used then as a measuring unit (like *week*).
5. a C-commands b if the first branching node dominating a also dominates b but a does not dominate b. So in (iv) x does C-command y and z. But neither y nor z C-commands x . Furthermore y and z do C-command each other (see Chomsky (1981)).

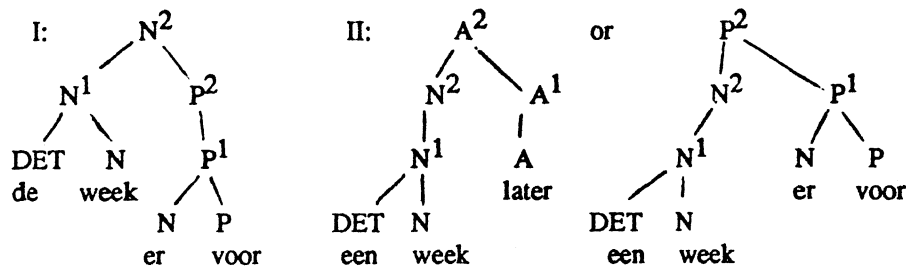


6. If some Wednesday has been introduced earlier in the context, 'on Wednesday' can refer to this Wednesday , or it can refer to the Wednesday following 'Tuesday' or to the one preceding 'Tuesday'; in fact it can refer to any relevant Wednesday. Which Wednesdays are relevant and which one among these is chosen in a communication situation is ruled by pragmatics. In absence of additional information about the identity of Wednesday, the most straightforward interpretation will be chosen. In (18d) for example this would be the preceding Wednesday and it would have been the following Wednesday if 'would be fired' was used in stead of 'was fired'.
7. There seems to be an interesting connection between the syntactic analysis of certain TADVs and their durational or non-durational interpretation. Compare the two groups of TADVs below.

I	II
Het afgelopen jaar ('last year')	Een jaar terug ('a year ago')
De week ervoor ('the week before')	Een week ervoor ('a week before')
(de) Verleden maand ('last month')	Een maand later ('a month later')

The members of group I have a durational interpretation: their denotation is an entire year/week/month. A TADV from group II functions as a kind of vector: the distance between the head and the tail of the vector amounts to a year/week/month. In a simple sentence this number of temporal units may specify the distance

between the Reichenbachian R and S points defined by the tense of the sentence (see Van der Eynde (1986)). In an X-bar like syntax, there would be a difference in structure between the I-TADV's and the II-TADV's (see Sturm (1986) for an extensively motivated, alternative structure for group II):



There is a systematic difference between the determiners in group I and those in group II. Furthermore, a preposition can easily be combined with group I but not with group II (and thus Kerstens suggestion that TADV's do not like prepositions is too general). In other words: a preposition does not mind a TADV with an N-head but it does mind a TADV with an A- or P-head. The preposition *binnen* ('within') seems to be a special case: it does not obey the rule.

8. The definition of governing category (from Chomsky (1981)):
 - β is a governing category for \hat{a} if and only if β is the minimal category containing \hat{a} , a governor of \hat{a} , and a subject accessible to \hat{a} .
 The definition of governor (from Chomsky (1981)):
 - β is a governor of \hat{a} if and only if
 - $\hat{a} = X^0$
 - where f is a maximal projection, if f dominates \hat{a} then f dominates β
 - β c-commands \hat{a}

9. The definition of binding (from Chomsky (1981)):
 - β binds \hat{a} if and only if
 - β c-commands \hat{a}
 - β and \hat{a} are coindexed

10. I restrict myself at this place to a tense that indeed requires conversion - the story for perfect is a slightly different one.

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