

# 1 *Introductory Chapter*

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## 1.1 Roadblocks to Compositionality

The present book will argue that a linguistic theory focussed on the compositional interaction of tense and aspect in sentences of natural languages is more likely to succeed in finding explanatory principles that apply universally to our dealing with time in language

- by assuming a binarily organized tense system rather than the mainstream ternary one originally proposed in Reichenbach (1947) and adapted or not by his followers;
- by rejecting the aspectual verb classifications proposed in Vendler (1957) and Kenny (1963) in favour of a strict compositional approach;
- by not allowing an eventuality  $e$  at the bottom of a sentential structure as a temporal argument of the verb, as done in event semantics following Davidson (1967), but rather by assuming a more abstract unit as the input to the computational machinery necessary for composing a complex temporal meaning at the top of a sentence.

The unifying idea behind this is that all three lines of research – on ternary tense, on aspectual verb classes and on event semantics – promote unjustifiedly (an outdated sort of) naive physics as the foundation for ontological structure and that, taken together, they stand in the way of dealing properly with compositionality by ignoring the crucial contribution of a verb to complex meaning. This does not exclude that, at the macro-level of discourse, events may function as standardly assumed in Discourse Representation Theory, but the present book is about the micro-level at which compositionality is a crucial issue.

For each of the three traditions, it is necessary to get to the core of my objections in some detail and to propose a coherent whole bringing the three separate alternatives together in a strictly compositional framework. In the present chapter, I will briefly and preliminarily comment on each of the three antagonistic views in order to shed some light on the reasons why I think they stand in the

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way of a proper linguistic compositional treatment of tense, mood and aspect at the sentence level.

**Ternary vs binary** Dutch school children master the eight tense forms of Dutch by learning a system originating in Te Winkel (1857;1866). They learn to use Dutch abbreviations such as **o.v.t.** for imperfect past tense and **v.v.t.t.** for perfect past future tense without realizing that the system is based on three binary oppositions yielding  $2 \times 2 \times 2 = 8$  tense forms.<sup>1</sup> For children

**Table 1.1** *Learning eight tense forms in school grammar*

<b>o.</b> Imperfect	<b>t.</b> Present	–	<b>v.</b> Perfect	<b>t.</b> Present	–
<b>o.</b> Imperfect	<b>v.</b> Past	–	<b>v.</b> Perfect	<b>v.</b> Past	–
<b>o.</b> Imperfect	<b>t.</b> Present	<b>t.</b> Future	<b>v.</b> Perfect	<b>t.</b> Present	<b>t.</b> Future
<b>o.</b> Imperfect	<b>v.</b> Past	<b>t.</b> Future	<b>v.</b> Perfect	<b>v.</b> Past	<b>t.</b> Future

learning the tense forms in Table 1.1, the three binary oppositions do not impose themselves. That is easy to understand when they are presented in (1).

- (1) a. Present – Past  
 b. Synchronous – Future  
 c. Imperfect – Perfect

The term *Future* is here detached from the tripartition Past–Present–Future and taken as ‘posterior to Present or to Past’ but the term *synchronous* in the sense of ‘simultaneous with Present or with Past’ is not visible in Table 1.1. It is virtually impossible for language learners to see that this system of oppositions proposed nearly one century before Reichenbach (1947) automatically supplies sufficient points of reference for mediating between the speech time S and an eventuality E. It is also impossible to see that it automatically solves the problem agonizing Reichenbach’s ternary approach, namely that in spite of adding the famous point of reference R as an intermediate between S and E, a ternary system cannot account for all eight tense forms of Dutch and English without stipulating an extra point. In a binary approach, all eight tense forms are covered systematically.

Within the long tradition of a primary division of tense into Past–Present–Future, the problem of a too-direct link between E and S had bothered

<sup>1</sup> Boldface **o** stands for *onvoltooid* ‘imperfect’ or ‘incomplete(d)’, boldface **v** for *voltooid* ‘perfect’ or ‘completed’, but also for *verleden* ‘past’, boldface **t** for *tegenwoordig* ‘current, present’ but also for *toekomend* ‘future’, but literally: ‘approaching’, ‘coming nearer’.

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generations of linguists before Reichenbach solved it.<sup>2</sup> He decisively illustrated the difference between the English Simple Past and Present Perfect with the help of the configurations in Figure 1.1. Positioning the perspectival point



Figure 1.1 *Opposing Simple Past and Present Perfect with the help of R*

of reference *R* in the Simple Past at the eventuality point *E* itself, Reichenbach put this point in the Present Perfect at the point of speech *S* posterior to *E*. This made it possible to see *R* as the present point of perspective on what happened at point *E*. This technical solution to a problem that many scholars in the ternary tense tradition had been stuck with, explains why Reichenbach's tense system became so popular.

My master's thesis in 1967 was about Reichenbach's system, but I did not yet recognize that the binary system that I had learned at school also made use of extra points of reference preventing a direct relation between the eventuality *E* and *S* and that they did so better than Reichenbach ever could imagine. The binary system of Table 1.1 produces them automatically. It was not until the early eighties when I supervised a historically oriented PhD thesis comparing a number of nineteenth-century Dutch school grammars, that I became directly acquainted with Te Winkel (1866).<sup>3</sup> It was an eye-opener resulting in Verkuyl and Le Loux-Schuringa (1985), which argued that a systematic comparison between Te Winkel (1866) and Reichenbach (1947) could only result in a resounding victory for a binary approach. At least for Dutch and English, and, as it turns out also for many other languages, both those with fewer than eight tense forms (Mandarin Chinese, Russian) and those with more than eight (French, Spanish, Bulgarian, Georgian), as argued in Verkuyl (2008). The first main line of the present book is therefore to get to the bottom of the difference between ternary and binary and to show that a binary approach offers the most profitable way for reaching strict compositionality.

**Compositionality vs Aspectual Classes** An essential ingredient of the present approach is to get rid of an Aristotelian-based naive physics that

<sup>2</sup> Chapter 2 will point out that he did not solve it but rather articulated a solution found more than seventy years earlier.

<sup>3</sup> The PhD thesis Le Loux-Schuringa (1984) is written in Dutch, Le Loux-Schuringa (1988) in English.

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entered linguistic theory on aspectuality decades ago at the expense of a more abstract (mathematically based) ontology. This more abstract approach does justice both to the way in which individual speakers handle tense and aspect information compositionally and to the variety of choices available to languages for encoding this information in atomic elements at the lexical level and bringing them together at the different levels of phrase structure.

Working on my PhD thesis, I read Vendler (1957) after I had already gone through the predominant German literature on Slavic aspect published around 1900. That put my appreciation for Vendler's quadripartition into perspective, much in the same way in which Mourelatos (1978:418) reacted to Vendler (1957) and Kenny (1963): that they were a little late in proposing classifications of the type well-known to generations of linguists working in the domain of research into verbal aspect. Vendler's classification of eventualities into States, Activities, Accomplishments and Achievements did not change the conclusion that I had already drawn from the linguistic aspectual classifications available in the literature on Slavic aspect, namely that they do not match with a search for atomic particles contributed by the verb and its arguments. It will be shown that only a binary view on tense makes it possible to conclude that exchangeability of tense in sentences like *He wins!* and *He has won!* – one of the showpieces of Vendler's analysis – turns out to be purely a matter of tense rather than of aspect and that this has consequences for Vendler's criterion for distinguishing between Accomplishments and Achievements.

It was Dowty (1979) who paved the way for Vendler in linguistic theory in spite of the fact that Vendler had called his 1967 book *Linguistics in Philosophy*. This title suggests that the reading circle for that book was intended to consist of (analytical) philosophers. It worked out differently: it implemented Aristotle's metaphysics as a structuring force in the domain of linguistic semantics. This allowed naive physics with an outdated view on motion and change to play a dominant role in the current theory of tense and aspect, in particular the view that each motion has an inherent goal. The second main line of the present book then is to show how Vendler's quadripartition of aspectual classes works against the idea of compositionality, apart from the basic methodological insight that classifications generally fail when it comes to explanatory power.

**Atemporal vs Temporal** My relation to Davidson (1967) has always been on the skeptical side because before I read that paper, I had already read the magnificent section 48 *The Problem of Individuals* in Reichenbach (1947:266–74). Although many attribute the introduction of an event variable  $e$  bound

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by an existential quantifier to Davidson, Reichenbach made use of it in that section. Reichenbach treated this introduction in the context of a distinction he made between thing-splitting (talking about “aggregates of matter keeping together for a certain time”) and event-splitting (talking about “space-time coincidences” which do not endure), as an option for speakers to take a certain perspective in a discourse (cf. Verkuyl 1972a:156–62;1976). Davidson took the floor by pointing out that there is a logical flaw in Reichenbach’s formulas and so Reichenbach’s cognitively interesting view on perspective disappeared into oblivion at this point. In combining binary tense with aspectual composition, however, the idea of adding an extra argument to a predicate is a proper way to go in dealing with “space-time coincidences”. In that sense, I will follow Davidson’s format of predicational structure: the variable  $\alpha$  that comes with it in the lexical characterization of a verb can be used at higher levels of phrase structure where it will be replaced by values contributed by tense operators.

Davidsonian and neo-Davidsonian event semanticists use the term *event* as temporal without taking into account the temporal role of tense. This yields a straightforward contradiction as soon as one analyzes a tensed sentence  $S'$  in terms of  $[\zeta' \text{ TENSE}(S_0)]$ , where TENSE stands for one or more tense operators taking a tenseless  $S_0$  so as to form a tensed sentence  $S'$ . In a compositional interpretation from bottom to top, a Davidsonian event variable  $e$  is to be located in the tenseless  $S_0$  as an argument of the verb. This implies that  $e$  cannot be temporal as long as TENSE has not yet been applied. Yet, Davidsonians regard their  $e$  as temporal, the more so because they generally happen to marry their view with Vendler’s view on aspectual classes. In this way, Davidsonian eventualities are generally partitioned into four naive physical classes, or three if one uses Kenny’s classification. My criticism of this unhappy marriage leads to the third main line running through the present book. I will use the eventuality variable  $\alpha$  as standing for a numerical value in a number system ( $\mathbb{R}$  or  $\mathbb{N}$ ) which turns into a temporal value only after the highest tense operator has been applied yielding  $S'$ . This more abstract approach opens the way for obtaining event structure in which compositionality can proceed from bottom to top without being blocked by the sort of prototyping inevitable in Aristotelian naive physics employed in the joint enterprise originating in Vendler (1957), Kenny (1963) and Davidson (1967).

A final remark must be made on the use of terms like *event*, *state*, *process* and *eventuality*. They are standardly used in Discourse Representation Theory. In spite of doubts about ill- and under-defined ontological notions like *eventuality* expressed in Kamp and Reyle (1993:504–10), the authors can live with Davidson’s formalism with  $e$  as an argument of the verb and interpreted

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as an eventuality *Ev*. The same happens in Kamp (2019). In this respect, I think, DRT is typically a macro-enterprise, whereas the present search for compositionality in the construction of sentence meaning is a micro-matter. The question is then – using the chemical metaphor – whether having an *Ev* in a model at the molecular level requires that *Ev* (already) exist at the atomic level. Our task will be to show that the answer is negative. If the three main lines sketched here are followed, a coherent alternative at the micro-level should become visible step by step, chapter by chapter.

### 1.2 **Finding Our Way in Babylon: Terminological Problems**

An enterprise like this has to keep in mind the Babylonian confusion of speech ravaging the field. Some examples may suffice for seeing the point. The first concerns the fact that in the long tradition of research on the Latin tense system, the perfectum has been the topic of a heated debate still going on.<sup>4</sup> Many Latinists unquestioningly oppose *perfectum* to *imperfectum* as a natural opposition, which, by the way, is also what Reichenbach did by opposing the English Present Perfect to the Simple Past in Figure 1.1. Among classical scholars there are those who defend the naturalness of the opposition by assuming that the Latin perfectum (also) expresses what in Greek is expressed by the aorist. On that semantic assumption, it is plausible that the Latin perfectum is a past tense form due to the fact that the Greek aorist was considered a past tense.<sup>5</sup>

The dominant term for expressing this pastness is *praeteritum*. Classical scholars often distinguish between *praeteritum perfecti* and *praeteritum imperfecti*. This practice is still visible in grammars of Romance languages. Spanish grammarians, for example, use the term *pretérito* as short for the aoristic *pretérito indefinido* also called *pretérito perfecto simple*. But the term *pretérito imperfecto* is also in use, which brings in the classical opposition between perfectum and imperfectum. Spanish grammarians also use the term *pretérito pluscuamperfecto* (Pluperfect) and more surprisingly also *pretérito perfecto compuesto* (Present Perfect).<sup>6</sup>

<sup>4</sup> A good survey is Pinkster (1983). The heat of the debate is visible in, for example, Serbat (1975;1976) and Rose (1984).

<sup>5</sup> Apart from the so-called gnomic and tragic aorist; see also CGCG:419. Babylon is also visible here: there are scholars who call the aorist use of the perfectum the *historical perfect*, whereas there are also those who use this term for the non-aorist interpretation.

<sup>6</sup> cf. García Fernández (2000), Arche (2014), Fábregas (2015), González and Verkuyl (2017) and the Cactus 2000 Spanish conjugation tables on the Internet.

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In Germanic languages like German and Dutch, the term *praeteritum* is also still in use but rather as a synonym for *imperfectum*. When used in English it is also applied to the Simple Past. It is difficult to evade babel when the term *preterit* is used for aoristic forms in some languages and for imperfectum forms in other languages. Reichenbach equalizes the English term Simple Past and the French term *Passé Simple*: both tense forms have the same configuration for him (1947:291). Yet there are valid arguments against a translational equivalence of an English Past tense form and the *Passé Simple*. As argued in Molendijk et al. (2004:281f.), there is no need for seeing the English Simple Past as an aoristic form and this certainly holds for its counterparts in other Germanic languages, among which Dutch. In short, writing about aspect and tense turns out to be moving through a terminological minefield when it comes to central terms.

A second example of confusion concerns the characterization of the Past Perfect as the *Past in the Past*, which is based on the idea of double anteriority. Let me write this as: Past<sub>1</sub>-in-the-Past<sub>2</sub>, to mark the problem. Without the subscripts it is more difficult to see that the term *Past in the Past* opposes the term *Past<sub>1</sub> Perfect* to the term *Present Perfect* on the assumption that *Perfect* stands for *Past<sub>2</sub>*. It also ignores the fact that this assumption requires that the Present Perfect be called *Present in the Past<sub>2</sub>*, a rather puzzling term. Leech (1971:34) comes close to the equation Past<sub>2</sub> = Perfect when saying that the Present Perfect is used “in reference to a past event to imply that the result of that event is still operative at the present time”. For Leech, the Perfect is in this case a resultative past. Why a past event should be called perfect remains unclear, because after all *She wrote an angry letter to me which I received this morning* is about two past terminated events without using a perfect.

The Past<sub>1</sub>-in-the-Past<sub>2</sub>-idea can also be found in Reichenbach’s configuration E—R—S in Figure 1.2, where the relation between E and R is put on the same footing as the one between R and S: anteriority. Yet for English, the

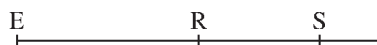


Figure 1.2 *Past of the Past*

E—R-configuration is dependent on the use of the auxiliary *have*, whereas the relation between R and S is determined by the choice of a past tense morpheme. In other words, there are sufficient reasons for taking the difference between the members of a relation more seriously. After all, in Reichenbach’s E—R

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one can say that E has been completed before R, but it is misleading to say that R is completed before S in R—S. Double anteriority also presumes that R in its relation to E in the configuration E—R be given exactly the role of S in its relation to R in the configuration R—S. The next chapter will pay detailed attention to this terminological confusion arguing that it results from imposing the system of Latin tense forms to tense systems of modern languages in the past centuries.

A third case in which terminology causes trouble is the distinction between the temporal use of the auxiliary *will* or *shall* in English and its modal use. The first problem is here that in sentences like (2) the form *will sing* is taken as a periphrastic tense of *sing*, where *will* expresses future or modality.

- (2) Maria will sing in the Albert Hall (tomorrow).

The terminological difficulty here is the use of the term *periphrastic tense*: does its use imply that the tense of the auxiliary form *will* itself does not count? This question has been largely ignored in the literature. The term *periphrastic tense of a (main) verb* suggests that the auxiliary *will* acts as a tense morpheme comparable with what is contributed by *-ed* in *She walked* but now pointing forward. I consider this an incomprehensible way of looking at what *will* really does – from a compositional point of view – because the role of PRES in the combination of PRES+*will*<sub>stem</sub> is ignored. If *will sing* in (2) expresses future in the temporal sense, there are two options: (a) the infinitival/stem form of the auxiliary *will* contributes temporality by projecting forward: Maria's performance is located on the day after the utterance of (2); and (b) the tense operator PRES in *will* does so. Option (a) raises the question of what the present tense form of *will* contributes and how the expression of future by *will*<sub>stem</sub> is compatible with the expression of presentness by PRES. Option (b) leads to asking what the “future meaning” of *will* is, when posteriority can be expressed by PRES. Note that one cannot escape from a choice between (a) and (b).

The second problem makes the issue even more complex because distinguishing between a temporal and a modal auxiliary *will* does not only require an answer to the question of why there are two verbs *will* but also why the same should hold for *She may/must sing in the Albert Hall* (tomorrow), as pointed out in Broekhuis and Corver (2016) and earlier in Quirk and Greenbaum (1973:47ff), one of the few didactic English grammars that work binarily.

There are more obstacles for getting out of Babylon. Generative grammarians, for example, use the notation ‘VP’ for what is traditionally and currently often written as an S by scholars outside the generative framework. Minimalists write VP because they work with V as the head of a projection line and



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in this way the external argument of a sentence is seen as taking the position of a specifier and the internal argument as a complement. However, using the label VP for what formal semanticists call a proposition is problematic outside the generative syntactic framework itself. Therefore I will use the label VP for the combination of a verb with its internal argument, the label S<sub>0</sub> for the tenseless proposition construed by combining a VP with the external argument, and the label S' for the resulting tensed sentence. In a direct discussion with syntactic proposals of the generative kind, no misunderstanding will arise about the use of labels.

A final case of terminological confusion concerns the use of notions like *reading*, *meaning*, *interpretation*, *use*, etc. What do scholars mean when they say that the Spanish Imperfecto has a descriptive use, a habitual use and a progressive use, as standardly distinguished in textbooks and research, as in Fábregas (2015)? For didactic grammars, it is understandable to make this distinction and to make a strong association between one of the three uses and a specific situation in which one had better apply it. But what does the term *habitual use* of a verb as distinguished from its *episodic* or *descriptive* use really say, theoretically? Making distinctions or not gives away a theoretical point of view. It might be typical for a verb to not have three different senses but to express just one meaning which functions differently in different contexts. Compare it with the noun *bird*. Do we have three nouns *bird* because of the sentence *That bird has arrived early this spring*? It allows for talking about a certain type (not a sparrow, but a stork), about a specific type, say the stork as a genus and about a ringed token stork. Would that be a reason for distinguishing three different nouns *stork*? In the present book, this issue will receive much attention because there is a relation between the need for distinguishing different uses of a verb and the level of abstraction at which one characterizes its meaning. Finding the real contribution of a verb to aspectual and tense information has clear consequences for the use of theoretical terms.

I have given only five examples of terminological problems. There are many more. Terms like *telos*, *culmination*, *result state*, *exchangeability*, *complete(d)*, *completion*, *perfect*, *perfective*, *imperfective*, *imperfect*, *anterior*, etc., all carry a long history with them in which they have demonstrably been used in different theoretical settings. It is not that I claim here to have solved that problem once and for all. But in sorting out the complexity of factors responsible for empirically reliable judgments about sentences, one needs to fix the theoretical terms, rejecting some terms as pretheoretical, adding some new ones because they express better what the formal tools do contribute. Some terms may qualify as useful for some languages and not so useful for others.

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**1.3 A Brief Inspection of the Chapters**

Chapter 2 corrects the tendency to let any serious theory of tense start in 1947 with the publication of Reichenbach (1947). It is absolutely necessary to connect the current theory of tense with classical grammar in order to take into account the aorist or its current descendants. This leads to a discussion of different ternary grids as part of a closer inspection of notions like *point*, *interval*, *fleeting n*, *landmark*, etc. This prepares the way for showing which sort of role they have in a binary approach.

Chapter 3 presents an updated version of the tense system of Verkuyl (2008) organized on the basis of the three binary oppositions. The update is needed in view of a number of improvements – substantively and notationally – due to later work. The main ingredient of Chapter 3 is the strict distinction between the notion of present (domain) and the notion of the fleeting point  $n$ , which has a counterpart in the distinction between past (domain) and then-fleeting point  $n'$ . The parallelism in a binary tense system is argued to be a dominant force in its organization.

Chapter 4 sketches how the contribution of ordinary language philosophers like Ryle, Kenny and Vendler to linguistic semantics added to the terminological confusion sketched above. Their delivery of the Aristotelian legacy to linguistics consists of a sort of naive physical ontology at the cost of the principle of compositionality. The misleading translation of Greek verb forms occurring in the crucial passus of Aristotle's *Metaphysics 1048b* into the English Progressive Form will be argued to have been decisive for what natural (language) philosophy handed to linguists: an outdated vision on motion. The chapter also sketches the heavy duty of a verb in taking all sorts of different arguments and argues that features are insufficient for the semantics of tense and aspect: they should be used as abbreviatory and for convenience only.

Chapter 5 describes how all verbs are anchored in the system of positive real numbers  $\mathbb{R}^+$  by focussing on the meaning of a verb without taking into account its arguments. This makes it possible to distinguish stative from non-stative verbs by assigning to each of them a (mathematical) function determining the value of the eventuality argument  $\alpha$  of the verb. The next step is then to separate non-stative verbs expressing continuity in  $\mathbb{R}^+$  from verbs expressing discretization in  $\mathbb{N}$  by assigning to the latter a discretizing function mapping from  $\mathbb{R}^+$  to  $\mathbb{N}$ . A formal account of aspectual composition from the tenseless bottom to the tensed top  $S'$  makes it possible to distinguish the (ten) factors that are in play on different levels of phrase structure.