**The aspectual structure of events**

**William Croft**

DOI:10.1093/acprof:oso/9780199248582.003.0002

**Abstract and Keywords**

Chapter 2, “The aspectual structure of events”, presents a fine-grained classification of aspectual types and introduces the two-dimensional geometric representation of aspectual structure. A verb denoting an event may belong to different aspectual types in different tense-aspect constructions; its range of types is its aspectual potential. Starting with Vendler’s four-way classification, additional aspectual types and alternative aspectual construals of events are introduced. The two-dimensional representation provides a systematic framework that accounts for the observed aspectual types. The first dimension is time (t), which is continuous (although some events are punctual). The second dimension are qualitative states (a) that the event goes through in time; the states may be discrete or continuous, when a scalar dimension is associated with the process. Aspectual structures are defined in terms of temporal phases that differ on the q dimension. One or more phases is profiled, and the remaining phases are part of the aspectual semantic frame of the event.

*Keywords:*   [aspect](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=aspect), [lexical aspect](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=lexical%20aspect), [Aktionsart](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=Aktionsart), [aspectual construal](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=aspectual%20construal), [(temporal) phase](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=%28temporal%29%20phase), [profile](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=profile), [state](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=state), [activity](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=activity), [achievement](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=achievement), [accomplishment](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=accomplishment), [English](http://www.universitypressscholarship.com/search?f_0=keywords&q_0=English)

**2.1 Introduction**

The category of aspect is a notoriously vexing one for semantic analysis, and has a long history (for a general survey up to 1990, see Binnick [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-28), and for a survey of more recent literature, see Sasse [2002](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-309)). A widely quoted definition of aspect is found in Comrie's [1976](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-64) survey: Comrie defines aspect as presenting ‘different ways of viewing the internal temporal constituency of a situation’ (p. 3). This broad definition is essentially correct, in my opinion, but when we turn to specific manifestations of aspect, things get more complicated.

Aspect is manifested both grammatically and lexically. Grammatically, many languages possess inflectional or periphrastic distinctions that modify ‘the internal temporal constituency of a situation’, such as the distinction between Progressive and Simple Present in English, the distinction between Preterite (Aorist) and Imperfect in several Indo‐European languages, and the distinction between Perfective and Imperfective in Russian. Grammatical aspect has been very difficult to define. One reason for this is that the semantic interpretation of the grammatical aspect categories often varies with the class of predicates (verbs and predicate adjectives and nominals) with which they are combined. This variation is generally attributed to differences in the lexical aspect (sometimes also called Aktionsart) of different classes of predicates. Lexical aspect is usually taken to be the inherent temporal structure of a situation: some situations such as being Polish are ‘naturally’ enduring states, while others such as a window breaking are ‘naturally’ punctual processes, and so on.

Sasse notes that there are currently two broad approaches to aspect, which he calls unidimensional and bidimensional (Sasse [2002](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-309): 202–3; see also Michaelis [2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-269): 9–10). In unidimensional approaches, the semantics of grammatical aspect is the same as the semantics of lexical aspect: grammatical aspect interacts with lexical aspect, but the result is of the same semantic type as lexical aspect. In bidimensional approaches, grammatical aspect is (p.32) semantically distinct from lexical aspect; its semantic structure is of a different type (usually characterized as a ‘viewpoint’ semantics; Michaelis [2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-269):9).

The approach presented here is basically a unidimensional approach, but with an essential contribution from the bidimensional approach. Our primary interest is with the semantic structure of predicates. However, as noted at the end of chapter [1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-1), predicates always occur in a tense–aspect construction, so the aspectual structure of events has to be inferred from the interpretations of predicates in different tense–aspect constructions. Michaelis argues for a unidimensional approach using an often‐invoked analogy to the category of countability in nominal semantics. In analyzing the use of a mass noun such as *orange juice* in a count noun construction as in *I’d like an orange juice, please*, attending to the boundaries of the substance (a glass of orange juice) is achieved with the same construction that is used with lexically count nouns such as *book*, namely the [*a(n) noun*] count construction. To capture that generalization, a unidimensional account of countability is necessary (indeed, for countability no bidimensional account has been proposed). The same applies to verbal aspect.

Sasse argues that recent bidimensional approaches are in fact converging on unidimensional approaches: they make reference to boundaries of an event in viewpoint aspect, a semantic property also used in lexical aspect (Sasse [2002](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-309):205). But a bidimensional approach (e.g. Comrie [1976](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-64); Smith 1997) contributes an important element to the analysis of aspect that should not be overlooked. Events do not have just an inherent aspectual type, as assumed in some unidimensional approaches: the event may be viewed from different aspectual perspectives or viewpoints. This observation is represented in our approach by the phenomenon of construal (§[1.4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-1#acprof-9780199248582-div1-4)). Construal is a generalization of the idea of different viewpoints or perspectives, aspectual or otherwise, on a situation (see also §[3.2.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-11)). We argue in this and the following chapter that construal is pervasive in understanding aspect—in fact, the theory of aspectual construals presented here is more elaborate than the relatively small number of aspectual viewpoints proposed in bidimensional theories.

Our first task is to develop an analysis of lexical aspectual types. Analyses of lexical aspectual types are many and varied. In this chapter, three broad approaches to the analysis of lexical aspect are discussed. The first is the use of primitive predicates and operators such as DO and BECOME to capture aspectual differences. The second is the use of temporal phases (boundary phases and state phases) in different combinations. The third is the use of an interval semantics, that is, the evaluation of propositions (including the main verb) relative to time intervals.

All of these approaches, as they are described in the literature, suffer from the problem that they capture only a subset of the lexical aspectual types that (p.33) have been identified in the semantics literature. The number of lexical aspectual types identified in the literature, surveyed in §[2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-8), has gradually increased, but no general framework that would account for all and (ideally) only the lexical aspectual types that are found has been put forward. In §[2.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-9), approaches using aspectual primitives and temporal phases are critically examined, and a two‐dimensional geometric representation, based on time and qualitative states, is introduced. In §[2.4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-10), it is shown how the two‐dimensional representation provides a general framework that covers all the attested aspectual types; it is compared to the interval semantics approach and recent work on scales in verbal semantics.

**2.2 Lexical aspectual types (construals)**

**2.2.1 The Vendler classification and its problems**

Most semantic analyses of lexical aspect take as their starting point a classification attributed ultimately to Aristotle but usually given in the form presented by Vendler ([1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361)). Vendler distinguishes four categories of lexical aspect, presented in (1), with commonly given examples of each:

(1)

* States: *be Polish, be polite, love*
* Activities: *sing, dance*
* Achievements: *shatter, reach [the summit]*
* Accomplishments: *cross [the street], read [the book]*

These categories are generally defined using three binary semantic features (Mourelatos [1981](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-279): 201–2): stative vs. dynamic (process), durative vs. punctual, and bounded vs. unbounded (or telic vs. atelic). Before describing the feature analysis of the Vendler categories, a few words must be said about terminology in the area of aspect.

The terminology for aspect is mired in confusion. Some conceptual properties are described by multiple more or less synonymous terms, e.g. bounded/unbounded, telic/atelic, perfective/imperfective. Since different scholars have different theories about the conceptual properties, the terms are not actually synonymous in different aspectual theories. Other terms are used ambiguously for clearly distinct categories. For example, ‘event’ is used to describe the superordinate category, as in the phrase ‘event structure’, but also for bounded processes in general (i.e. achievements and accomplishments in Vendler's categorization), or for achievements in particular.

On top of the synonymy and ambiguity of the terms for basic conceptual distinctions in aspect research is the pervasive confusion in virtually all linguistics discourse between the use of a term for a conceptual category (p.34) and use of the same term for a language‐specific grammatical category. For example, perfective/imperfective is used to describe the conceptual distinction (bounded/unbounded), and to describe a grammatical category in a particular language such as Russian where that category encodes the semantic contrast in at least some circumstances. The problem arises, of course, when the grammatical category is used for some other purpose. For example, the English Simple Present tense is used not just for present time reference (*She loves Couperin*), but also for future time reference under certain circumstances (*I leave for Austin on Thursday*).

The problem of confusing conceptual and grammatical categories will be resolved here by avoiding the use of grammatical terms such as perfective/imperfective for conceptual semantic categories, and everywhere by using capitalized terms for language‐specific grammatical categories, following Comrie ([1976](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-64)), Bybee, Perkins, and Pagliuca ([1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-54)), and Croft ([2001](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-88)). With respect to the synonymy and ambiguity of aspectual semantic terminology, terms will be chosen and defined explicitly (with apologies to those who use different terms, or the same terms with different meanings; the Glossary contains a list of all terms used in the analyses in this book). Perhaps the most contentious choice here will be to use event as the superordinate term for all lexical aspectual categories. ‘Event’ is used in this sense in the generative and cognitive linguistics literature on event structure, but not in the formal semantics literature, where ‘event’ is most commonly used to refer to bounded processes. (Instead, the superordinate category is referred to with the terms ‘eventuality’ [e.g. Bach [1986](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-10): 6] or ‘situation’ [e.g. Comrie [1976](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-64): 13].) In fact, there is a good theoretical reason not to use ‘event’ for bounded processes: processes can be bounded in two different ways (§[3.1.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-10)). I will also use the four Vendler category terms for the aspectual classes as defined immediately below.

states describe situations that do not change over time, i.e. are stative. The states that Vendler discusses are also extended in time, i.e. they are durative; and they do not have a ‘natural’ endpoint, i.e. they are unbounded; this feature will be discussed further in §[3.1.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-10). activities describe situations that involve change over time, i.e. they are dynamic events or processes. In addition, activities are durative (extended in time) and unbounded (they do not have a ‘natural’ endpoint). achievements also describe processes, but they describe a change of state that is instantaneous or at least conceptualized by the speaker as instantaneous, that is, occurring in just one point in time. That is, achievements are punctual. The punctual change of state ends in a resulting state, e.g. the shattered object or being at the summit; hence they are also bounded. accomplishments are processes that are bounded, that is, they lead to a (p.35) ‘natural’ endpoint such as arriving at the other side of the street or the end of the book (see §[3.1.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-10)), Accomplishments are durative, but in the process they ‘proceed toward a terminus’ (Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361):101). Later work describes this procession as an incremental change (Dowty [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-126)); this description will be discussed further in §[3.1.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-9). The Mourelatos features defining each Vendler category are given in (2):

(2)

1. Click to display

Vendler, like most linguists, uses the methodology of finding tests to classify predicates into his four categories. For example, Vendler uses the test of an answer to the question *What are you doing?* in the Present Progressive to distinguish states from processes (the stative/dynamic distinction):

(3)

Q:

 What are you doing?

A:

 I am running/\*I am knowing it.

The test distinguishes the process *run* from the state *know*.

Vendler uses the temporal questions *At what moment…?* vs. *For how long…?* to distinguish achievements from states (the punctual/durative distinction):

(4)

1. a. At what moment did you spot the plane?
2. b. For how long did you believe in the stork?

(5)

1. a. \*For how long did you spot the plane?
2. b. \*?At what moment did you believe in the stork?

The achievement *spot the plane* is perfectly acceptable with *At what moment…?* in (4a), and the state *believe in the stork* is perfectly acceptable with *For how long…?* in (4b). Using the “wrong” temporal question leads to ungrammaticality, or more precisely, semantic incoherence. However, (5b) is not as bad as it should be according to Vendler: it can be construed as asking for the moment in time when the addressee came to believe in the stork. This is the first hint here that not everything is clear‐cut in the linguistic analysis of lexical aspect.

Vendler uses the constrast between temporal interval adverbials with *for* and *in* to differentiate activities and accomplishments (the unbounded/bounded distinction):

(6)

1. a. He pushed the cart for half an hour.
2. b. He drew the circle in twenty seconds.

(p.36)

(7)

1. a. ?\*He pushed the cart in half an hour.
2. b. ?He drew the circle for half an hour.

The activity *push the cart* is perfectly acceptable with the *for* adverbial in (6a), also called the Durative adverbial, to describe the length of time over which the event occurred. The accomplishment *draw the circle*, on the other hand, is perfectly acceptable with the *in* adverbial in (6b), also called the Container adverbial, to describe the length of time over which the event occurred. The Durative/Container adverbial contrast is still widely used to distinguish bounded and unbounded processes. In theory, use of the “wrong” temporal interval adverbial should lead to semantic incoherence. In fact, (7a–b) are not completely bad and in fact both are interpretable: (7a) can with some difficulty be construed as describing the time interval leading up to the beginning of the event, while (7b) can more easily be construed as describing an activity (in Vendler's sense) that ended in a half an hour without the full circle being drawn.

In still other instances, Vendler was aware that his “tests” did not produce the expected results. Vendler uses the test *It took NP TimeInterval to…*in order to distinguish accomplishments from other categories, but the construction is perfectly acceptable with achievements (Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361): 101, 104):

(8) It took him twenty seconds to draw the circle.

(9) It took him three hours to reach the summit.

Vendler writes, ‘Even if one says that it took him three hours to reach the summit, one does not mean that the “reaching” of the summit went on during those hours’ (Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361): 104). Sentence (9) is acceptable in the interpretation that three hours describes the time interval leading up to reaching the summit from some contextually determined starting point (e.g. setting out from the last camp, or after lunch, or something equivalent).

Vendler uses another test to distinguish states from processes, namely the Simple Present question in (10):

(10)

Q:

 Do you know…?

A:

 Yes, I do.

But this test also yields a perfectly acceptable result with at least some processes (Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361): 99):

(11)

Q:

 Do you run?

A:

 Yes I do.

In a footnote, Vendler notes that the test rejects *run* as a state ‘[u]nless a very different meaning of *running* is involved’ (Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361): 99, fn. 5). That meaning, of course, is the habitual activity of running, or the inherent ability to run.

(p.37) The general problem is very well put by Dahl in his monograph on tense and aspect systems:

…in addition to the fact that some aspectual notions are expressed by morphological means in some languages, it is also true for all languages that verbal lexemes differ in their ‘aspectual potential’…As often happens, the theoretically nice distinction [between ‘grammatical’ and ‘lexical’ aspect] turns out to be rather difficult to apply in practice. To start with, we encounter the problem of separating out the ‘inherent aspectual meaning’ from contextual influences—after all, every occurrence of a verb is in a definite context, and there is no obvious way of determining what a ‘neutral aspectual context’ would be like. Also it turns out that there is an astonishing flexibility in how individual verbs may be used.

(Dahl [1985](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-107): 26–7)

Dahl makes several important observations. First, a predicate does not inherently belong to a single aspectual type. Instead, it has the potential to be conceptualized or construed in multiple aspectual types (see §[1.4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-1#acprof-9780199248582-div1-4) on the interpretation of construal potential). Hence the aspectual types are also aspectual construals of predicates; I will refer to them as either aspectual types or construals in this book. This is a very important observation, which was made early on in the contemporary linguistic analysis of aspect (e.g. Dowty [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124): 61–2, [1986](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-125): 43; Mourelatos [1981](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-279): 196–7; see also Levin and Rappaport Hovav [2005](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-254): 90). Aspectual types may be, and have been, unnecessarily multiplied because a predicate that allows construals of two aspectual types is taken to represent a new aspectual type. The alternative construals may be induced by the grammatical context, e.g. the difference between *They reached the summit* and *It took them two hours to reach the summit*.

Moreover, one cannot automatically assume that one of the aspectual types or construals is the ‘basic’ one (see §[1.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-1#acprof-9780199248582-div1-3)), although much discussion tends to assume this at least for convenience of exposition, and for many event types there does appear to be a fairly clear default construal (see §[2.4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-10)). Finally, Vendler's four‐way categorization of aspectual types—semantic types that are defined by the semantic features, independently of what predicates are construed as belonging to those types—is incomplete.

In the remainder of this section, we will examine the major alternative construals of predicates that have been observed in the literature, and the new aspectual types that have been added to Vendler's original four categories.

**2.2.2 Alternative construals and new aspectual types**

In addition to acknowledging that the sentences in (5b), (7), (9), and (11), which should be semantically incoherent according to the aspect tests, can be interpreted, Vendler also observes that certain stative predicates are perfectly (p.38) acceptable in non‐stative contexts (Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361):113–19). Predicates such as *know, see*, or *remember* are construed as (transitory) states when they occur in the Simple Present:

(12) I know how to do this.

(13) I see Mount Tamalpais.

(14) I remember her.

But they can also be construed as achievements in the Past tense:

(15) I suddenly knew the answer.

(16) I reached the crest of the hill and saw Mount Tamalpais.

(17) I instantly remembered her.

Vendler describes *see* and *know* as having two senses (Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361): 113). However, the two ‘senses’ depend on the grammatical context (tense–aspect constructions such as Simple Present or Past, further supported by Punctual adverbials such as *suddenly* or *instantly*). The two senses correspond to two aspectual construals: *see* and *know*, and English perception and cognition predicates in general, have an aspectual potential to be construed as either a state or an achievement in the appropriate semantic and grammatical context. As noted above, state and achievement are not inherent aspectual types of predicates but aspectual types or construals that different predicates have the potential to possess. We will call the class of predicates that have the aspectual potential of states or achievements that result in the state inceptive states.

Another example of multiple aspectual potential is the category of disposition predicates such as *be polite* or *be friendly*. Dowty notes that *John is friendly* is a state, describing an inherent personality trait of John, whereas *John is being friendly* is an activity, describing a particular occasion of John behaving in a friendly manner (Dowty [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124): 114). In our terms, disposition predicates allow alternative construals as a state and as an activity.

In some cases, new aspectual types proposed in the literature also appear to be verbal semantic classes that allow alternative construals already recognized in the Vendler classification. For example, Role and Reference Grammar introduces an aspectual type, ‘active accomplishments’, for activity verbs that also have an accomplishment construal, e.g. *Erin ate* [activity] vs. *Erin ate the pie* [accomplishment] (Van Valin and LaPolla [1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-358): 99; see also Van Valin [2005](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-357): 32–3). Active accomplishments are described as ‘the accomplishment use of activity verbs’ (Van Valin and LaPolla [1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-358): 99), and they are distinguished from other accomplishments because their decompositional analysis in Role and Reference Grammar differs from that of other (p.39) accomplishments (see §[2.3.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-5)). In our analysis, *eat* has the potential for (at least) two construals, as activity and as accomplishment. There is no need to introduce a separate aspectual type; there is only a need to recognize that this verb class has a distinctive aspectual potential.

A more challenging case is represented by the sentences in (18)–(19):

(18)

1. a. Jim is standing at the top of the stairs.
2. b. The box is lying on the bed.
3. c. Bats were hanging from the roof of the cave.

(19)

1. a. He's holding the baby.
2. b. She's sleeping.
3. c. The flowers are blooming.

These predicates have been described as ‘stative progressives’ (Dowty [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124): 173), ‘dynamic’ (L. Carlson [1981](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-56): 39), ‘dynamic states’ (Bach [1986](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-10): 6), ‘inactive actions’ (Croft [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-78): 97, [1998*c*](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-85): 72), and ‘homogeneous activities’ (Michaelis [2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-269): 10). All of them have in common that they appear to be semantically stative, but in English they take the Progressive. We will call the lexical classes that display this grammatical behavior inactive actions.

The basic semantic problem is why a situation type that appears to be stative in the real world—no change is taking place, at least outwardly—is expressed grammatically by an English construction, the Progressive, which otherwise requires a process. Dowty's and Bach's analysis suggest that these are really states; Michaelis argues that they are really processes; and Carlson calls them intermediate between states and activities. Carlson and Michaelis introduce them as a new aspectual type. It does not appear that there is a new aspectual type here, however: there is instead a problem of what aspectual type, state or activity, the predicates in (18)–(19) should be assigned to, because of the conflict between our perception of the semantic type of the event and its grammatical expression in English. In fact, the predicates in (18) also occur in the Simple Present, so they actually do allow alternative aspectual construals. The class of predicates illustrated in (18)–(19) is discussed further in §§[2.4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-10), [3.2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-12).

In other cases, alternative aspectual construals of predicates give rise to new aspectual types that do not fit into Vendler's four‐way categorization. Smith ([1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-324): 55–8) argues that a fifth aspectual type or construal should be added to Vendler's original four types, that describes the temporal structure of examples such as:

(20) Harriet coughed (once).

Example (20) denotes a punctual event that does not lead to a different resulting state: after emitting the cough, Harriet ‘reverts’ to her normal (p.40) uncoughing state. Smith calls this type ‘semelfactive’, a term now widely used. This aspectual type was also identified by L. Carlson ([1981](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-56): 39), who calls them ‘momentaneous’, Talmy ([1985](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-338): 77), who describes them as the ‘full‐cycle’ class, and Jackendoff ([1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-208): 40), who calls them ‘point events’. I describe them as cyclic achievements (Croft [1998*c*](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-86): 74), and will use this last term here, synonymous with ‘semelfactive’ (see §[2.4.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-7)).

Smith also notes that the same predicate *cough* can be used to describe an activity, when combined with a Durative temporal adverbial or the Progressive (Smith [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-324): 55):

(21) Harriet coughed for five minutes.

(22) Harriet was coughing.

In other words, *cough* has an aspectual potential to be construed as either a cyclic achievement (semelfactive) or as an activity. Which construal is found depends on the tense–aspect construction *cough* occurs in (Past tense, Durative adverbial, Progressive). Since we will make frequent reference to the semantic classes of predicates that have both the activity and cyclic achievement (semelfactive) construals, we will call these predicate classes cyclic actions.

Another alternative construal reveals yet another aspectual type. The Progressive is unacceptable for most predicates usually construed as achievements because the Progressive applies to a durative situation:

(23) ?\*The window is shattering.

However, it is perfectly acceptable, under the right circumstances, to use the Progressive with some predicates typically considered to be achievements (Dowty [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124): 137):

(24) She's dying!

(25) He's falling asleep.

(26) They are reaching the summit.

In these cases, the Progressive form describes a runup process before the achievement of the change of state (and in fact, that change of state may not be achieved; see also Vendler [1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361): 104). Again, there are two alternative construals of the aspectual type of the situation, depending on the grammatical aspectual context. With the Past tense and a Punctual adverbial, *She died* is an achievement. With the use of the predicates in the Progressive in (24)–(26), however, a new aspectual type must be recognized.

Although *He's falling asleep* is durative and bounded, it lacks an important semantic property of Vendler's accomplishment category. Vendler's (p.41) accomplishments consist of an incremental, measurable change over time that leads to the resulting state, as indicated by the acceptability of a Measure phrase:

(27) I have read a quarter of the way through the newspaper.

But the process leading up to falling asleep or dying is not an incremental, measurable process:

(28) \*She has died/fallen asleep a quarter of the way.

In (28), the processes that end, or may end, in death or falling asleep cannot be described—more precisely, cannot be readily construed—in terms of an incrementally measurable degree of death or degree of asleepness. Also, one's progress toward the end state is not incremental: one can fluctuate back and forth between various states before the result state is achieved.

Rothstein ([2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-305): 98–9) gives examples of predicates in which the runup process aspectual construal appears to be the default construal:

(29)

1. a. Harry was repairing the computer.
2. b. John is painting a portrait of his cat.
3. c. Leave me alone—I’m solving Rubik's cube.

Rothstein writes, ‘Repairing a computer, for example, does not usually involve affecting the computer gradually or incrementally, but rather fiddling around with it and trying various things until you hit on the cause of the problem and thus its solution’ (Rothstein [2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-305): 98). Likewise, painting can involve painting out things and altering the composition in a nonincremental way until the painting is declared finished; and solving a puzzle (or proving a theorem), like repairing a computer, may involve going down several blind alleys and backing out of them before hitting on the solution (if ever).

This aspectual type was noted by Vendler ([1967](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-361): 101, 104) and Dowty ([1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124): 137, who refers to ‘achievements in the progressive’); it was subsequently referred to as ‘progressive achievements’ (e.g. Rothstein [2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-305)). I originally named this aspectual construal a runup achievement (Croft [1998*c*](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-86): 74): a nonincremental process leading up to an instantaneous transition to a resulting state. It is unlike the other achievements in that it is not punctual. It is like an accomplishment in being extended as well as leading to a resulting state, but not in an incremental fashion. This category, and the name we will use for it, is discussed further in §[2.4.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-7).

**2.2.3 New aspectual subtypes**

Further lexical aspectual distinctions have been proposed in the aspect literature. G. Carlson introduces a semantic distinction he describes as object‐level vs. stage‐level; it has also been called generic vs. episodic (G. Carlson [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-55): 56–7; (p.42) Kratzer [1995](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-235); Chierchia [1995](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-59)). An object‐level predicate describes an event that is permanent for an entity (object), such as *be Polish*: one's ethnicity is a result of one's ancestry and cannot be changed. A stage‐level predicate describes a transitory event (state or process), such as *be ill, be angry*, or instances of processes such as *(be) read(ing)*: one is not inherently ill, angry, or reading; these states and processes come and go in the lifetime of an entity.

One effect of introducing this distinction is to divide the Vendlerian category of states into transitory states, such as *be ill* or *be angry*, and permanent states such as *be Polish*. (All processes are transitory/stage‐level.) Permanent states have been described as ‘absolute states’ by Comrie ([1976](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-64): 104). Whether a state is transitory or permanent is subject to construal in certain cases: for example, the predicate *be dry* is transitory when attributed to clothes, but inherent when attributed to a desert (cf. Klein [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-229): 82–3). We will use the terms permanent and transitory to describe the two types of states (see §[2.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-9) for further discussion and distinctions). The two types can be differentiated by Frequency adverbs—permanent states cannot occur multiple times:

(30) Jane is ill often.

(31) \*Jane is American often.

There is another distinction among permanent states. A permanent state like *be Polish* is inherent: one is born Polish (by virtue of the ethnicity of one's parents), and one who is born Polish will remain (ethnically) Polish for the rest of their lives. Other permanent states are acquired: in *The vase is cracked*, the vase cannot be made intact again—it will always be cracked, even if the crack is repaired—but it was intact, i.e. not cracked, at some preceding time (cf. Klein [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-229): 85).

The inactive action (stative progressive) predicates presented in the Progressive in (18), repeated below, are also allowed in the Simple Present, as in (32):

(18)

1. a. Jim is standing at the top of the stairs.
2. b. The box is lying on the bed.
3. c. Bats were hanging from the roof of the cave.

(32)

1. a. The statue of George Washington stands at the center of the square.
2. b. The Sandia mountains lie to the east of Albuquerque.
3. c. A large chandelier hangs from the dining room ceiling.

Goldsmith and Woisetschlaeger ([1982](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-168)) argue that the Progressive uses in (18) represent the situation as ‘phenomenal’: it is presented as an accidental property of the entity. In contrast, the Simple Present uses in (32) represent (p.43) the situation as ‘structural’: it is presented as an inherent property of the way the world is. We would describe this contrast as one between a transitory state construal and a permanent state construal (see §[2.5](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-11); Langacker [2008](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-246): 149). Goldsmith and Woisetschlaeger's analysis also suggests that this category of predicates, posture predicates, does not constitute a new aspectual type but rather another predicate class with its own set of alternative construals, in English at least.

The Frequency adverb test also distinguishes two subtypes of achievements, which we will call reversible and irreversible achievements:

(33) The door opened/closed twice.

(34) \*The mouse died twice.

(35) \*The window shattered twice.

Achievements such as opening or closing a door can be reversed and therefore repeated. Achievements such as dying, shattering, and most predicates of destruction or disintegration cannot be reversed or repeated.[1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-note-6) Talmy describes these two subtypes of achievements as resettable and nonresettable verbs (Talmy [1985](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-338): 77). As with transitory vs. permanent states, a predicate such as *break* may be construed as a reversible achievement, as when it is applied to a repairable machine such as a washing machine, or it may be construed as an irreversible achievement, as when it is applied to a window or a stick.

Mittwoch identifies a third subtype of state, point states (Mittwoch [1988](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-274): 234), which has been little discussed in the literature. Point states can be illustrated in the following examples:

(36) It is 5 o’clock.

(37) The sun is at its zenith.

(38) It is exactly one hour since she left.

(39) The train is on time.

Finally, Dowty ([1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124): 88–90) discusses a category that he calls ‘degree achievements’, such as *cool, sink, age*. Dowty treats them as ambivalent—i.e. allowing alternative construals as activities and accomplishments—since they occur with both Durative and Container adverbials, with different meanings (*The soup cooled for/in an hour*; Hay, Kennedy, and Levin [1999](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-189): 127). But Hay, Kennedy, and Levin ([1999](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-189): 132) argue persuasively against an ambivalence (p.44) analysis. Instead they propose that the activity construal of degree achievements represents an unbounded but incremental directed change on a scale, i.e. an aspectual type distinct from (undirected) activities. In other words, Hay, Kennedy, and Levin argue for a distinct aspectual construal of an unbounded but incremental or measurable activity. Thus, the Vendlerian aspectual type of activities is divided into directed and undirected unbounded processes. This is another aspectual type that has been discovered and named several times: L. Carlson ([1981](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-56): 39) describes directed activities as ‘dynamic’; Talmy ([1985](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-338): 77) describes them as ‘gradient verbs’, and Bertinetto and Squartini ([1995](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-26)) describe them as ‘gradual completion verbs’. We will call them directed activities, in contrast to the undirected activities that Vendler originally described.

**2.2.4 Summary**

Vendler's classification has undergone many alterations and additions. It has been recognized that predicates may be ambiguous over multiple aspectual types or, as we describe them here, they have alternative aspectual construals. Some of the alternative construals give rise to new aspectual types, such as cyclic achievements and undirected accomplishments. Other aspectual types split Vendlerian categories, such as transitory vs. permanent states and reversible vs. irreversible achievements. Still other aspectual types require redefinition of Vendler's categories, such as directed vs. undirected activities: Vendler's activities were undirected, and the directed (sub)type is different enough that it is commonly given a completely different name (e.g. degree achievements). These additions and modifications to Vendler's aspectual types have been made in parallel in the logical, generative, and cognitive semantic literatures, leading to a proliferation of different terms that makes it even more difficult to develop an exhaustive classification of aspectual types.

If we gather together the different aspectual types/construals that have been proposed to characterize the aspectual potential of predicates, we have the following revisions and extensions to the Aristotle/Vendler classification:

(40)

1. a. Four types of states: inherent (permanent) states, acquired permanent states, transitory states, and point states; the last could be seen as a subtype of transitory states
2. b. Two types of activities: directed activities and undirected activities
3. c. Two types of achievements: reversible achievements and irreversible achievements
4. d. Accomplishments
5. e. Cyclic achievements (semelfactives)
6. f. Runup achievements—not punctual like other achievements, but not incremental like Vendlerian accomplishments

(p.45) This classification is not systematic. That is, it is not clear why there are the aspectual types that there are in the classification. Nor is it clear whether this classification is exhaustive, or whether there are further aspectual types that happen not to have been observed in the aspectual literature. In the following section, I present an analysis of lexical aspect that provides a coherent framework for the aspectual types given above. In this analysis, the possible aspectual types can in principle be extended from the classification given above, but the types already observed in the literature do represent more or less the full range of the most basic aspectual types.

**2.3 A two‐dimensional geometric analysis of aspectual types/construals**

The analysis of lexical aspect presented here relies on three crucial analytical concepts: the notion of temporal phase, the explicit modeling of a second dimension representing the unfolding of the event over time, and the addition of a semantic frame to the conceptual representation of an aspectual type/construal. After reviewing some alternative analyses of lexical aspect (§[2.3.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-5)), we present a two‐dimensional geometric analysis of aspectual types/construals (§[2.3.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-6)).

**2.3.1 Symbolic and phasal analyses of aspectual types**

A widespread approach to analyzing lexical aspect is in terms of symbolic primitives. One example of such symbolic primitives are the three binary semantic features introduced in §[2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-8): stative/dynamic, durative/punctual, and bounded/unbounded. Many analyses use these three features, defined in different semantic models, in order to account for the Vendler classes in (2). However, as many scholars have noted, there are many other lexical aspect types, summarized above in (40). The three binary features are insufficient to distinguish all of these lexical aspect types, let alone explain their interrelationships.

The interrelationships between some lexical aspect types have been captured by decompositional analyses, so that some aspect types are analyzable as combinations of lexical aspect primitives. For example, processes that lead to a resulting state, such as achievements, can be analyzed as BECOME(STATE). These analyses usually include causal semantic primitives as well, since verbal semantics clearly involves causation as well as aspect.

Dowty ([1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124)) represents the major early proposal of this type of representation. He presents a calculus for combining primitive state predicates with the primitives DO, BECOME, and CAUSE. This calculus allows Dowty to differentiate subtypes of the Vendler classes, for example different causal subtypes of (p.46) accomplishments such as the two illustrated in (41) (Dowty [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124): 124–5; π,ρ = unary states or stative n‐ary relations; α,β = arguments of predicates):

(41)

1. a. Non‐intentional Agentive Accomplishments:

[[DO(α1,[π*n*(α1,…, αn)])]CAUSE[BECOME[ρm(β1,…, βm)]]]

(*John broke the window*).

1. b. Intentional Agentive Accomplishments:

DO(α1,[DO(α1,π*n*(α1,…, αn))CAUSE φ]),

where φ may be any non‐stative sentence (*John murdered Bill*).

The accomplishment verb meanings in (41) include state primitives (π,ρ) and the primitives DO and BECOME as well as CAUSE; DO is characteristic of (undirected) activities and BECOME of (directed) achievements.

Dowty's calculus allows for a variety of aspectual types, more than the Vendler classes, although the primitives do not distinguish punctual and durative, or different kinds of states. Dowty's calculus is also intended to include the periphrastic expression of events, such as *John began to build the house* and *The door's opening causes the lamp to fall down* (Dowty [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124):124).

The scholars that followed Dowty generally limit their attention to events that are lexicalized as simple verbs or predicates, and their event structures are therefore more limited (in fact, finite). Their analyses focus on decompositional analyses of the Vendler classes, usually supplemented with types that Vendler did not recognize. For example, Role and Reference Grammar uses an inventory of (stative) **predicate**, **do**, INGR, BECOME and SEML to distinguish the four Vendler classes plus semelfactives and what is called ‘active accomplishments’ (the accomplishment construal of activity verbs; see §[2.2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-2)), summarized below (Van Valin [2005](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-357): 45):

(42)

1. a. State: **predicate´** (x) or (x,y)
2. b. Activity: **do´** (x, [**predicate´** (x) or (x,y)])
3. c. Achievement: INGR **predicate´** (x) or (x,y) *or*

INGR **do´** (x, [**predicate´** (x) or (x,y)])

1. d. Accomplishment: BECOME **predicate´** (x) or (x,y) *or*

BECOME **do´** (x, [**predicate´** (x) or (x,y)])

1. e. Semelfactive: SEML (x) or (x,y) *or*

SEML **do´** (x, [**predicate´** (x) or (x,y)])

1. f. Active Accomplishment: **do´** (x, [**predicate´** (x) or (x,y)]) & INGR **predicate´**

(x) or (x,y)

(p.47)

Role and Reference Grammar's calculus apparently allows for only the types in (42), plus causative versions of each. (Van Valin and LaPolla [[1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-358): 108–9] also allow the use of NOT for negative resulting states of predicates such as *remove, drain*, and *take (from)*.) However, there are an indefinite number of stative **predicate** types.

Rappaport Hovav and Levin ([1998](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-299)) introduce lexical semantic templates, which are decompositional symbolic analyses of the Vendler classes, including causal variants. Their basic templates are listed in (43):

(43)

1. a. Activity: [ x ACT〈*MANNER*〉 ]
2. b. State: [ x 〈*STATE*〉 ]
3. c. Achievement: [ BECOME [ x 〈*STATE*〉 ] ]
4. d. Accomplishment: [ [ x ACT〈*MANNER*〉 ] CAUSE [ BECOME [ y 〈*STATE*〉 ] ] ] *or* [ x CAUSE [ BECOME [ y 〈*STATE*〉 ] ] ]

For Rappaport Hovav and Levin, like Van Valin, the set of event structure templates in (43) is fixed, though there are an indefinite number of *STATE* and *MANNER* symbolic primitives, which represent the semantic diversity of the verbal lexicon (Levin and Rappaport Hovav [1995](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-252): 23). Levin and Rappaport Hovav call the latter ‘verbal constants’, but later use the term root, following others in the literature (Levin and Rappaport Hovav [2005](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-254): 71).

The symbolic decompositional analyses capture the composite form of certain aspectual types, and therefore allow certain relationships among the aspectual types to be captured. However, the relationships among the aspectual primitives themselves (STATE/predicate, DO/ACT, and BECOME) cannot be explicitly represented without some theory to analyze those primitives. Also, the semantic primitive CAUSE is completely different in ontological type from the aspectual primitives, but if all of these concepts are primitives, there is no way to represent this fact except by stipulation. Finally, these primitives are distinct from the lexical constant/root primitives, in that the former have more combinatorial possibilities than the latter. If possible, a theory that allows for the analysis of aspectual primitives as well as capturing the composite nature of some aspectual types would be desirable.

A first step in this direction is the introduction of temporal phases to the analysis of aspect. Binnick ([1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-28): 194–207) argues that the notion of a temporal phase is essential for defining Aktionsart (which for him includes derivational morphology for aspect as well as lexical aspect):

Since Streitberg there has been a great proliferation of schemes of *Aktionsarten* and of *Aktionsarten* themselves, too many to review here. Each scholar attempted to establish a logical taxonomy, a principled organization of the sundry *Aktionsarten* such that their various differences in meaning could be revealed and the set of all possible *(p.48) Aktionsarten* be logically defined and organized. In the absence of a clearly defined concept of phase, these efforts were doomed to failure.

(Binnick [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-28): 202)

Phasal analyses of aspect have increased in popularity. Here we briefly describe and critique four different types of phasal analyses of aspect.

Woisetschlaeger ([1982](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-370)) is cited by Binnick as an early example of a phasal analysis. Woisetschlaeger uses a first‐order predicate calculus semantic representation quantifying over subevents in time intervals, for example defining termination as the last subevent of the event (p. 22). However, Woisetschlaeger does not define qualitatively distinct subevents, apart from ‘pause’ (i.e. event does not take place), and so his analysis does not capture the wide range of aspectual types described in §[2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-8).

More recent phasal analyses largely fall into two types: analyses that model boundaries of temporal phases of events, and one analysis that models the phases themselves (but not the boundaries). Parsons ([1990](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-289)) presents a boundary‐oriented phasal analysis of Vendlerian aspectual types (Jackendoff [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-208):38–40 offers a similar model). Parsons uses three types of phases: development, culmination, and holding (Parsons [1990](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-289): 23–4; Parsons actually states that he recognizes ‘two key technical notions’, culminating and holding, but uses a development phase as well). States simply hold, without any culmination. Accomplishments have a culmination and a ‘development portion’. Achievements have a culmination, but need not have a development portion. In their typical construal (the achievement construal, in our terms), a predicate like *win the race* in *Henry won the race* consists of only a culmination. But in the Present Progressive, a sentence like *Henry is winning the race* is semantically coherent, and describes a development portion (p. 24).

Parsons's analysis recognizes two phases in events such as accomplishments and achievements, namely that they include a culmination phase (or consist solely of a culmination phase, in the case of the achievement aspectual type/construal). States lack that phase; they only hold. Parsons appears to analyze the development portion of an accomplishment as a state that holds, because in English that phase is expressed by the Present Progressive, as in *Agatha was crossing the street*, and the Progressive construes the phase as a state (Parsons [1990](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-289): 171; he analyzes the development portion as an ‘In‐Progress’ state). Parsons's analysis also does not easily handle activities. He argues that activities like *walk* are a series of iterated walking subevents (1990: 184), on the basis of the fact that if *Mary ran* is true of a time interval (say, 4pm to 5pm yesterday), then *Mary ran* is also true of a subinterval (say, 4:15pm to 4:30pm yesterday). Each subevent culminates, but the amalgamated whole event may not culminate (p. 184).

(p.49) A family of more fine‐grained phasal analyses uses boundaries at the beginning as well as the end of events (Breu [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-44); Sasse [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-308); Johanson [1996](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-216), [2000](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-217); Bickel [1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-27)). These analyses distinguish three possible phases of an event: an initial (inceptive) boundary transition; a middle phase; and a final boundary transition. Aspectual types are defined as to whether they include the initial or final boundaries or both.

Breu ([1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-44)) uses a contrast between boundary and a middle phase. The combination is described as a ‘state of affairs’, which may or may not include initial and final boundaries; there is no explicit description of the middle phase independent of the presence or absence of boundaries. Breu recognizes the following aspectual types:

(44)

1. a. Inherent states (*contain, weigh*) have no boundary.
2. b. Predicates such as *know* which have state and achievement (inceptive) construals (i.e. inceptive states) have an initial boundary—‘before you *know something* you have to *come to know* it’ (Breu [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-44):26) but not a final one.
3. c. Activities have initial and final boundaries, because ‘it is impossible for someone to *read* or *work* for a limitless period of time’ (p. 26).
4. d. Accomplishments such as *write something* and *drown* (Breu's ‘gradually terminative’ predicates) have a final boundary, but one defined by the ‘exhaustion of an inherent “quantity” ’ (p. 26).
5. e. Achievements such as *find, explode*, and *reach* (Breu's ‘totally terminative’ predicates) have beginning and ending boundaries that coincide; Sasse ([1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-308): 36) and Bickel ([1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-27): 116) include the result state as a second phase.

Thus, there are five aspectual types instead of Vendler's four: inceptive states are added to the list (Sasse [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-308): 36), although they represent state vs. achievement construals of the same predicate.

Bickel ([1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-26)) has essentially the same model, representing the boundary phase as τ and the middle phase as φ. Thus inceptive states have the phasal representation τφ, while predicates like *die* that allow a runup achievement construal (*He's dying!*) have the phasal representation φτ. Johanson ([1996](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-216): 233) describes the internal phase structure of an event, using the same primitives of a beginning boundary (‘first limit’), middle (‘course’), and an end (‘second limit’). Johanson also distinguishes five aspectual types: achievements have a final boundary but no middle; accomplishments have a final boundary and a middle; inceptives have an initial boundary and a middle; activities have a middle but no boundaries and are dynamic (a feature not otherwise represented); and states have a middle but no boundaries and are static (p. 234).

(p.50) Grammatical aspect results in semantic representations of the same semantic type as the lexical aspectual representations. Grammatical aspect semantically selects or highlights certain phases of an event; hence Bickel ([1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-27)) calls his theory a selection theory. For example, in Bickel's notation, English *die* has two phases [φτ]: the runup process (φ) and the final transition to death (τ; p. 116). The Simple Past (*She died*) selects only τ and the Progressive (*She's dying!*), only φ. In contrast, the Belhare verb *misen nima* ‘(get to) know’—like the English *know* illustrated in examples (12) and (15)—has two phases [τφ]: the inception (τ) and the resulting state (φ; compare Johanson's ‘initiotransformatives’; Johanson [1996](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-216):236).

Languages can vary as to the aspectual type assigned to translationally equivalent predicates. For example, Bickel argues that English *die* and French *mourir* are of the type φτ, since the English Progressive and French Imparfait can select the runup phase; but the Chinese equivalent *si* is of the type τφ, since the Chinese aspectual constructions can only select the achievement or the (result) state of the event. Breu's analysis recognizes the existence of phases, and also recognizes that some event types have boundary phases that can be left unselected. For example, *John knows where you are* has an initial phase but it is not selected by the English Simple Present, and *Masha is writing a letter* has a final boundary phase but it is not selected by the English Present Progressive.

However, the boundary‐based phasal analysis has difficulties in analyzing activities: they do come to an end (*She stopped dancing*), but not in the same way as accomplishments do (*She finished weaving the rug*). Sasse refers to this as two types of boundedness (Sasse [2002](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-309):221–2): in a paper using Breu's theory, Sasse characterizes the contrast as one between potential and inherent boundary (1991:34). Yet in some grammatical contexts as in the Russian Perfective verb form *porabotat’* ‘work for a while’ (Breu [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-44):28), the termination of an activity is actual, not potential, and in the English Progressive *Masha is writing a letter*, the final boundary of the accomplishment is potential, not actual. Hence the existence of a simple boundary phase, otherwise left unanalyzed, is inadequate for capturing this difference in final boundaries. An adequate phasal analysis will need to differentiate these two boundary types (see §[3.1.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-10)).

Nor does the boundary‐based phasal analysis capture the fact that transitory states such as *be open* and *know* have an end as well as a beginning: an open door can be closed, and one can forget what one has come to know. Hence transitory states will also have an initial and final boundary phase, like activities and accomplishments. Since Breu's middle phase does not distinguish between state and process, Breu's phasal model cannot capture the distinction between transitory states and activities. Sasse describes states as being ‘conceived of as situations without regard to their boundaries’ (Sasse [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-308):35). Bickel refers to the possibility of differentiating stative and dynamic (p.51) phases (Bickel [1997](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-27):117, fn. 2), as does Johanson, as noted above; but the distinction is not explicitly incorporated into either Bickel's or Johanson's aspectual representations.

The boundary‐based phasal analysis also fails to capture the distinction between accomplishments and runup achievements, namely that the former describe a measurable incremental change toward the final state while the latter do not. In both cases, e.g. *die* in Bickel's analysis [φτ] and *write something* [τφτ] (using Breu's and Sasse's analysis and Bickel's notation), an Imperfective or Progressive construction selects φ, but this does not differentiate between the incremental and nonincremental changes in *write the letter* vs. *die*.

Klein ([1992](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-228), [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-229)) offers a phasal analysis based on the number of phases, rather than boundaries: in Klein's model, boundaries are implicitly represented in that events with more than one phase will have a boundary between the phases. Klein defines events in terms of the succession of possible states rather than the boundaries that hold between them. Klein distinguishes three aspectual types: 0‐state, 1‐state, and 2‐state. A 0‐state lexical content is always in that state, that is, there are no other states for the individual to which the lexical item is applied. An example would be the locative *be in* in the sentence *The Nile is in Africa*. A 0‐state predicate corresponds to an inherent state in the description in §[2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-8). A 1‐state lexical content denotes a particular ‘state’—more precisely, phase, since the ‘state’ may be stative or dynamic—but the state can be preceded by a ‘pretime’ and followed by a ‘posttime’ in which the state (phase) does not hold (Klein [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-229):84; this is similar to von Wright's logic of change, defined by successive states holding/not holding; see Dowty [1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124):73–8). Finally, a 2‐state lexical content denotes at least two distinct states, a source state and a target state (Klein [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-229):86). The target state corresponds to the resulting state in an achievement or accomplishment aspectual type. Klein argues that transitions from one state to another—boundaries—may be punctual or durative, and he does not semantically distinguish between the two possibilities (p. 88).

Klein's analysis of aspectual types is embedded in a complex theory of time reference which we cannot do justice to here. Klein's analysis captures some elements of phases that the boundary‐based analyses do not. For example, Klein's analysis recognizes that all aspectual types except the 0‐state (inherent states) include both a pretime (preceding) phase and a posttime (following) phase in which the event denoted by the predicate does not hold. However, Klein's model does not distinguish between states and processes, or more accurately, the state–process contrast is a separate feature that is not captured by his categorization of events into 0‐state, 1‐state, and 2‐state.

Klein's model also does not distinguish between a transition that is punctual, as in achievements like *snap*, and a transition that is durative, as in (p.52) accomplishments like *write a letter*. He argues that such distinctions are pragmatic (part of world knowledge), not semantic (Klein [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-229):88): in the case of *Clive found a proof of Fermat's Last Theorem*, whether it happened in an instant or took a long period of time is not part of the lexical semantics of *find* (cf. Dowty [1986](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-125):43; and §[2.4.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-8)). The contrast here is between an achievement and a runup achievement—if Clive took a long time to find a proof, one cannot say that *Clive is a quarter of the way to finding a proof of Fermat's Last Theorem*. The punctual and durative construals of English *find* are part of the aspectual potential of that lexical item. One must also be able to contrast events such as finding, which may be punctual, from events such as writing a letter, which cannot be punctual (see also Mittwoch [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-275) and Rothstein [2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-305):40–6 for arguments in favor of keeping achievements and accomplishments/runup achievements distinct).

Klein also has to accommodate certain aspectual types that require elaborations to his model. Klein observed the existence of what we described in §[2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-8) as acquired permanent states, such as *The quagga is extinct*; he analyzes it as a type in which there is a pretime (the quagga was extant) but no posttime (it will never come back again) (Klein [1994](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-229):85). Another problematic aspectual type is cyclic achievements (semelfactives) such as *The light blinked*, where there is a sequence of off–on–off states. Klein notes that the light ‘returns’ to its initial state, analyzing it not as a 3‐state predicate but ‘as [having a] 2‐state lexical contents one of whose states is branching’ (p. 86). These examples indicate that the classification of events into zero through two states (plus inferred transitions) is not sufficient in itself to capture all of the aspectual types observed in §[2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-8).

A fourth type of phasal analysis is offered by Timberlake ([1985](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-347)). Timberlake assumes an interval temporal semantics like Woisetschlaeger, and focuses on boundaries. But he argues that events must be described in terms of their ‘histories’, that is, how they unfold over time, and that aspectual types can select ‘partial histories’, not unlike the selection operation in boundary‐based phasal analyses described above (Timberlake [1985](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-347):46). Timberlake also describes events as a function from time intervals to situations and suggests that qualitative changes in state form a second dimension after that of time (pp. 52–3). These important insights, not developed further by Timberlake to my knowledge, also form the basis of the analysis presented in the rest of this chapter.[2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-note-7)

**(p.53) 2.3.2 A two‐dimensional phasal analysis of aspectual types**

Our analysis of phase in lexical aspect, like Timberlake's, recognizes that aspectual phases involve not just one dimension, time, but two. In our approach, lexical aspect describes how events are construed as unfolding over time. This definition of course requires a representation of the temporal dimension. Phasal analyses recognize that there must be a temporal dimension, although most phasal analyses do not represent a temporal scale: instead there is a temporally ordered sequence of phases which themselves are treated as atomic primitives of the semantic representation. Our use of a temporal dimension in verbal semantic representation is similar to the positing of an obligatory temporal profile to verbs in Cognitive Grammar (Langacker [1987](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-243):244–54, [2008](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-246):108–12; see also §[1.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-1#acprof-9780199248582-div1-2)), though in Cognitive Grammar it is restricted to finite verb forms.

But ‘unfolding’ itself must be described. The unfolding of events is the sequence of qualitative states that characterize a particular event type. The second dimension for representing lexical aspect is therefore the set of qualitative states of the unfolding event. In this model, then, events are represented in two dimensions, time (*t*) and qualitative states (*q*; in the 2000 version of this book, and in Taoka [2000](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-343), the second dimension was described as a change dimension represented by *Δ*). We introduce the basic dimensions of the model and the example of the aspectual structure of a seeing event in Figure [2.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-2).

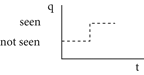


Figure 2.1. The two‐dimensional representation of aspect.

The *x* axis is the time dimension (*t*), and the *y* axis is the qualitative state dimension (*q*). The time dimension is continuous. The qualitative state dimension may or may not be continuous, depending on what qualitative states are defined for the event (which, in turn, is dependent on how the lexical item construes the event). For example, seeing has only two defined states on *q*: not seeing something and seeing something. Thus, the *q* dimension for seeing actually consists of only two points. The two states are positioned far apart on *q* for visual convenience.

The *q* dimension is a representation of what might be considered to be the concrete, specific or ‘idiosyncratic’ (Levin and Rappaport Hovav [2005](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-254):71) properties of a predicate's meaning. These properties are what Levin and Rappaport Hovav call a lexical constant or root (§[2.3.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-5)). In the representations (p.54) of Levin and Rappaport Hovav and others, the root is taken to be a semantic primitive. The *q* dimension represents the lexical root as a complex semantic structure, made up of multiple states, and thus provides one way to analyze the lexical root. Some basic properties of lexical roots will be derived from the *q* dimension in this chapter.

Jackendoff ([1996](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-209)) presents a model of aspectual structure that is similar to the one given here, but not in geometric form as in Figure [2.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-2). He argues that time should be treated as a continuous dimension, and that physical space (as in motion events) should also be treated as a continuous dimension (pp. 316–17), and recognizes that some “spaces” (our *q* dimension) are not continuous, such as possession—objects do not gradually change ownership (p. 330). Jackendoff's article focuses on a particular aspectual type, gradual or incremental change (see §[3.1.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-9)), and does not exploit the geometric properties of his model in the way that is done in this and the following chapters. However, Jackendoff's model captures some of the same intuitions as behind our model.

The dotted contour in Figure [2.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-2) is how the seeing event unfolds over time. Seeing something is a transitory state, that is, one starts and stops seeing a particular object within one's lifetime; seeing a particular object is not a permanent state. Seeing has at least three phases: not seeing something; the transition from not seeing something to seeing it; and seeing that thing. The sequence of phases just described represents the aspectual contour of the event.[3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-note-8) The transition phase is construed conceptually as an instantaneous jump from one state to the other. Just as only two points on the *q* dimension are defined for seeing, the transition is actually a quantum jump from the not-seeing state to the seeing state, and there are no intermediate states occupied by the participant in the event. For visual convenience, however, the transition is represented by a vertical line in the geometric representation.

The English verb *see* is an inceptive state: that is, it easily allows a transitory state construal and an achievement construal of the predicate without any morphological derivation. These alternative construals were illustrated in examples (13) and (16), repeated below:

(13) I see Mount Tamalpais.

(16) I reached the crest of the hill and saw Mount Tamalpais.

The alternative construals are of course a product of combining the English verb *see* with two different tense–aspect constructions of English, namely the Simple Present in (13) and the Simple Past in (16). The resulting aspectual (p.55) construals for (13) and (16) are represented in Figures 2.2a and 2.2b respectively.

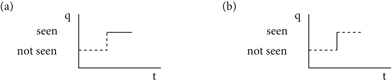


Figure 2.2. Alternative profiling of English *see*.

Figure 2.2a represents the transitory state construal by the solid line for the resulting state (seeing) phase: sentence (13) denotes that phase and not the other phases. Instead, sentence (13) presupposes the other phases, this being part of our conceptual knowledge of seeing (i.e. that seeing a particular object is something that comes and goes). Figure 2.2a is thus a frame‐semantic representation of the meaning of (13). The resulting state phase is what is denoted or profiled by the Verb + Simple Present construction. The preceding phases (and of course the defined points on the *t* and *q* dimensions) are presupposed by (13) and are thus part of the semantic frame for seeing. Hence, the representation of the aspectual contour for seeing in Figure 2.1 simply is the SEE semantic frame, or more precisely, the part of the semantic frame relevant for the aspectual behavior of SEE. Figure 2.2a designates or profiles one concept in that semantic frame, namely the resulting transitory state of the seeing event.

Figure 2.2b represents the achievement construal denoted by sentence (16). Recall that the vertical line is used for visual convenience; it actually is a quantum leap from a profiled point at the end of the not-seen state phase to a profiled point at the beginning of the seen state phase. Sentence (16) has the same semantic frame as (13), but a different phase is profiled by the Simple Past use in (16). The semantic similarities between the meanings of the two sentences is captured by the similarity (in fact, identity) of the semantic frames for the two sentences, and the semantic difference is captured by the differences in the profiled concept in the semantic frame.

The profiled phase of an event's aspectual contour is the phase asserted to hold in the world at a particular point in time, namely the time reference denoted by the tense of the construction. In Figure 2.2a, that is the moment of the speech act, and in Figure 2.2b, that is a moment that temporally precedes the moment of the speech act.[4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-note-9)

(p.56) There is of course an asymmetry between unprofiled phases in the semantic frame that precede and follow the profiled phase. Phases that precede the profiled phase are presupposed to have held or taken place in the time interval preceding the time of the profiled phase. What follows the profiled phase is in the future. In some cases, there is an entailment that a future phase will occur. For example, in the case of sentence (16), although it only denotes/profiles the quantum leap from not seeing to seeing, the fact that the change of state has occurred implies that the state of seeing will hold for at least a brief interval. That is why there is an unprofiled phase in Figure 2.2b following the profiled phase: it represents the entailment that if I have come to see Mount Tamalpais, then I will see Mount Tamalpais for at least a brief interval of time.

Thus, the only phases in principle that are represented as part of the semantic frame are those that are presupposed or entailed by the profiled phase in the semantic frame. For example, it is not entailed that I stop seeing Mount Tamalpais; I could suddenly drop dead of a heart attack such that the last thing I see is Mount Tamalpais. For this reason, there is no unprofiled transition from seeing to not seeing after the unprofiled seeing phase in the representation in Figure 2.2b (or in Figures [2.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-2) or 2.2a for that matter). However, the time scale continues beyond the end of the unprofiled phase of seeing, and the unprofiled phase of seeing does not continue indefinitely with the time scale. This represents the possibility (indeed, likelihood) that the transitory state will end before the end of the individual's lifetime.

An aspectual type or construal of a predicate is a representation of the kind found in Figure [2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-3). An aspectual type/construal consists of a particular profiled phase (or phases) on a particular aspectual contour, where the aspectual contour is defined by geometric properties of the defined points on the *q* dimension (e.g. that there are only two defined points on the *q* dimension), rather than specific values on that dimension (such as ‘not seen’ and ‘seen’).

Also, the aspectual properties used to define the Vendler aspect classes and other aspectual properties can be defined as geometric properties of the two‐dimensional representation. For example, the punctual/durative contrast, one of the ways that sentences (13) and (16) contrast, is straightforwardly defined as profiling one point vs. an interval on the time dimension. The state/process contrast, another way that sentences (13) and (16) contrast, is defined as profiling one point vs. an interval on the qualitative state dimension. An interval is defined as consisting of more than one point on a dimension such that for all points *a* and *b* in the interval, there is no defined point *c* between *a* and *b* that is not in the interval. This definition includes the transition phase in the seeing event as an interval on *q*, because there is no (p.57) defined point between the two defined points of not seeing and seeing in the transition phase.

In this analysis, inceptive states such as English *know* and *see* do not represent a distinct aspectual type, as implied by the analyses of Breu and Bickel (see §[2.3.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-5)). Instead, English *know* and *see* have the aspectual potential of two alternative construals without morphological derivation, each of which is one of the aspectual types already found in the aspect literature and listed in (40) in §[2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-8). By separating the aspectual potential of specific language predicates from the aspectual type represented by each alternative construal of a predicate, we significantly reduce the number of ‘lexical aspects’ that have to be accounted for. As will be seen in chapter [4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-4), there is in fact an indefinitely large number of predicate classes each having its own unique aspectual potential or range of possible aspectual construals. Finally, we represent the relationship between the inceptive and transitory state construals as the profiling of different phases on the same aspectual contour.

The two dimensions of the geometric representation of aspect—time and qualitative state—correspond to conceptual structures found in other representations of aspect, namely temporal phases (or temporal properties defined in some other way) and the idiosyncratic root of an event. The difference is that these two conceptual structures are represented geometrically. The implication is that the geometric properties of such a representation are better suited to capturing the relevant linguistic semantic patterns. I have already noted that aspectual semantic features such as punctual/durative and state/process can be defined straightforwardly in the geometric representation, as points vs. intervals on the *t* and *q* dimensions respectively. In the next two sections, we will describe how the geometric representation can account for the variety of aspectual types that have been observed in the literature, and the semantic construal processes that are found in alternative aspectual construals of particular predicates.

**2.4 A general framework for aspectual types**

**2.4.1 Motivating the typology of aspectual types/construals**

The *t/q* phase representations presented in §[2.3.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-5) allow us to incorporate the aspectual construals and distinctions identified in the aspectual literature. It turns out that these aspectual types can be most easily grouped into four general categories corresponding to Vendler's original four‐way classification.[5](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-note-10) The four kinds of states in (40a) are represented in Figure [2.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-4).

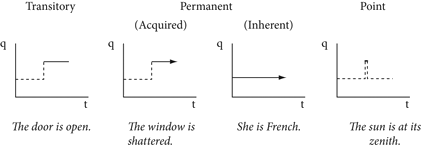


Figure 2.3. Four kinds of states.

(p.58) The first type is a transitory (stage‐level) state, while the second and third are permanent (object‐level) states. Transitory states have a start and may have an end, represented by the ending of the transitory state before the end of the time dimension.

Permanent states hold for the (remaining) lifetime of the entity. Inherent states are true of the entity for its entire lifetime. Acquired permanent states are true of the entity for its entire lifetime once the state has been acquired. Permanent states are represented by a phase headed by an arrow, which is shorthand for a phase that extends as long as the timeline extends.

The timeline is defined relative to the lifetime of the entity; that is, the *t* dimension applies to that entity as long as it is taken to exist. Of course, an entity can cease to exist. For example, the Frenchwoman referred to in *She is French* in Figure [2.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-4) will not live forever. It will still be true that being French is an inherent state that held for the Frenchwoman, even after she has died, although our time perspective at that moment will generally require a speaker to use the English Past tense to describe that inherent state: *She was French* (see Mittwoch [2008](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-277) for an analysis of the use of Present and Past tense with inherent states of living and dead entities).

The lifetime of an object is also subject to construal. Sentences (45)–(46) each describe an acquired permanent state:

(45) Sweet William is dead.

(46) The window is shattered.

In (45)–(46), the *t* dimension construes the lifetime of the entity as going beyond biological life and physical integrity for at least some relevant period of time. The acquired permanent state lasts for that period of time. But the period of time is limited. It is odd to say *King Sargon II of Akkad is dead* (he died in 705 bc); the death must be recent and relevant in some way to the (p.59) present (e.g. *My grandparents are dead* is OK, but *My great‐great‐great grandparents are dead* is odd). Also, describing the acquired permanent state of a destroyed object as a present state tends not to be acceptable after the remnants are removed, scattered, thrown away, etc. Thus (46) would not be appropriate once I have swept up the shards and thrown them in the garbage can.

The last type of state in Figure [2.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-4) is a point state. Point states such as *(the sun) is at its zenith* profile a state that lasts only a point in time. What counts as a point in time is also subject to construal. In *It is 5 o’clock*, depending on how precise one wants to be, the point in time may last 60 seconds (from 5:00:00 to 5:00:59), before which it was 4:59 and after which it will be 5:01. But at a minute‐sized level of precision, the 60 seconds is construed as a point in time. Punctual events in general are punctual only to a degree of precision that is relevant to the interlocutors’ goals in the discourse. The same is true, incidentally, of qualitative states on the *q* dimension: *Russia and Georgia are at war* construes quite a lot of activity as being just a single point on the *q* dimension (being at war vs. not being at war).

Since the point state lasts for only a point in time, reversion to the initial state, which I will call the rest state (compare Woisetschlaeger's ‘pause’), is entailed: since it is 5 o’clock for only a point in time, there will be a transition resulting in a return to the rest state. Thus there are two entailed phases beyond the profiled point state phase in the geometric representation in Figure [2.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-4). In this respect, point states differ from very short transitory states, such as *The light is on!* uttered at just the right moment of a flashing light—that utterance does not necessarily entail that the light will go off, whereas *The sun is at its zenith* does entail that it will no longer be at its zenith after that point in time.

What all states have in common is that their profiled phase is only a single point on the *q* dimension. The subtypes of states differ in their extension on the *t* dimension: a point or an interval, including intervals extending the whole of the relevant timeline.

To three kinds of states (excluding inherent states, where there is no change in the entity's lifetime), there correspond three kinds of achievements (see Figure [2.4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-5) on p. 60).

Reversible achievements result in transitory, hence reversible, result states. Irreversible achievements result in permanent, hence irreversible, result states. Reversible and irreversible achievements are both directed achievements, which are defined in the geometry as profiled transitions in which the entailed (unprofiled) result state phase is a state at a different point on the *q* dimension from the presupposed (unprofiled) initial rest state phase. I will conventionally place the result state higher on the *q* dimension than the rest (p.60)

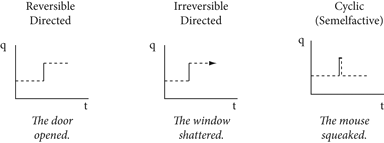


Figure 2.4. Three kinds of achievements.

state. So, for example, in *I removed the flowers from the table*, the result state of being not on the table is higher on the *q* dimension representation than the rest state of being on the table.

Directed achievements contrast in this property with cyclic achievements (semelfactives). Cyclic achievements result in point states, which then revert to the rest state. For example, the mouse emits a squeak, which is a pointlike sound, and then is silent again (until the next squeak). What is profiled is the transition from silence to squeak, not just the squeak: *squeaked* denotes a punctual change, not a point state. I will continue to call this aspectual type a cyclic achievement, although I will also use the widespread term ‘semelfactive’ as a synonym, in order to use the term ‘achievement’ to refer to all kinds of punctual changes of state.

This implies a broader definition of achievement than Vendler and his successors use; his achievements only included directed achievements. Our definition includes both directed and cyclic achievements. The latter can also be described as undirected achievements; we will shortly see their close semantic relationship to undirected activities. achievements are geometrically defined as a transition from one state to another on the *q* dimension at a single point on the *t* dimension.

Likewise, our definition of activity is broader than Vendler's: his examples consisted solely of undirected activities, whereas our definition includes directed activities. activities in this broad sense are durative, unbounded processes. The two types of activities are represented in Figure [2.5](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-6) on p. 61.

Directed activities involve a continuous (or at least incremental) change along the *q* dimension, but without a transition to a result state representing a completed action (this will be described shortly with accomplishments). On the other hand, there is an inception phase from the rest state: the quantum leap from the rest state to the state representing the first state of the activity, (p.61)

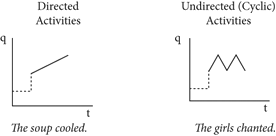


Figure 2.5. Two kinds of activities.

represented by a vertical line (see §[2.3.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-6)). These phases precede the profiled activity phase and so are presupposed by it.

The gradual change is associated with a particular participant, called the incremental theme (Dowty [1991](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-126)); more recent work has treated the gradual change as a scale associated with the verbal meaning (Hay, Kennedy, and Levin [1999](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-189); Kennedy and Levin [2008](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-224)). We will turn to the proper analysis of the incremental theme/verbal scale in §[3.1.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-9) after defining all of the aspectual types; for now, we observe that the scalar nature of the gradual change is easily represented by a continuous interval on the *q* dimension. Directed activities are transitory, hence there is a rest state (when the soup is not cooling), as well as a transition from that rest state to the beginning of the directed activity. Also, no phases beyond the profiled directed change phase are included in the semantic frame for directed activities, because no change to a result state is entailed; but nor do directed activities extend for the entire lifetime of the entity.

Undirected activities do not involve a continuous directed change along qualitative states in the *q* dimension. I have represented undirected activities with a zigzag line on the *q* dimension. This is not an arbitrary choice. Undirected activities are typically construed as a succession of cyclic (undirected) achievements. For example, chanting (talking, singing, etc.) is a repeated emission of certain types of sounds; walking (running, dancing, etc.) is a repeated taking of steps of a certain type. Hence undirected activities could also be called cyclic activities. The defined states for undirected activities on the *q* dimension, apart from the rest state that represents its transitory character, are two (or perhaps more) states which the entity goes back and forth between. More generally, the defined states on the *q* dimension for undirected activities cannot be ordered such that there is an incremental directed change over the time course of the event. Thus, a more accurate representation of undirected activities in any particular case involves (p.62) transitions from one point to another on *q* but without incremental progress toward a result state (if any) on *q*.

Both directed and undirected activities are durative processes: their profiled phase is extended, not punctual, on both the *t* and *q* dimensions. In this respect they contrast both with states, which are punctual (a point) on the *q* dimension, and with achievements, which are punctual on the *t* dimension.

Vendler's category of activities included only undirected activities; conversely, Vendler's category of accomplishments consists of only bounded, directed durative processes. Complementing accomplishments are what I have called ‘runup achievements’, which are bounded, undirected durative processes (see Figure [2.6](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-7)).

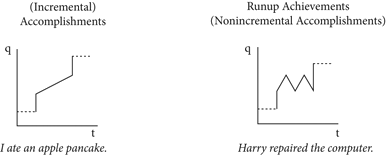


Figure 2.6. Two kinds of accomplishments.

Accomplishments differ from all of the other aspectual types represented so far in that three phases are profiled: the inception and completion phase as well as the directed change phase. This is because accomplishments are durative but bounded: the inception and completion phases bound the accomplishment. A temporally bounded (t‐bounded) event is one in which the transition phases (i.e. punctual changes) at the beginning and the end of the event are profiled. The beginning and end transition phases are the temporal boundaries of the event. Achievements are also bounded: in the case of achievements, the inception and completion phase are one and the same, namely the one profiled transition phase (there is no middle phase). Since accomplishments include a completion phase, there is also an implied (unprofiled) result state, as well as the rest state preceding the beginning of the event. Accomplishments such as *write a letter* are said to have a ‘natural endpoint’; this natural endpoint is the result state on the *q* dimension, and progression toward the natural endpoint is defined by the points of the scale of the directed change. The relationship between a natural endpoint and temporal boundedness will be discussed in §[3.1.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-10).

(p.63) A runup achievement is represented as a bounded event with profiled beginning and end transition phases, but the middle profiled phase is an undirected activity. Runup achievements are distinguished from accomplishments in that there is no monotonic progression from the rest state to the result state. As we observed in §[2.2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-2), if someone is *dying* or *drowning*, they are construed as going from one unfortunate state to another, unless or until they go from one of those intermediate states to the result state of being dead or drowned. In particular, the non‐dead states are all construed as being alive, not as being dead to some partial degree (despite the expression *half‐dead*, which is either metaphorical or describes a nonincremental state that is neither normal life nor death). Obviously, if the runup process can be construed as a directed monotonic change on a scale ending with the result state, then such a predicate has an alternative construal as an (incremental) accomplishment available to speakers.

More often, however, a runup achievement is an alternative construal for a (punctual) directed achievement. For this reason, this aspectual type has been called a progressive achievement or runup achievement, although it is not punctual. A better term would be nonincremental accomplishment, avoiding the punctual implication of ‘achievement’. We will adopt this admittedly cumbersome term so as to restrict ‘achievement’ to punctual events only. Vendlerian accomplishments should be renamed (incremental) accomplishments; but we will generally continue to call them ‘accomplishments’ following tradition.

Whether an accomplishment is incremental or nonincremental (or for that matter, whether an activity is directed or undirected) is subject to construal depending on context. An accomplishment may be construed as incremental even if it is not perfectly incremental over time. For example, reading a linguistics article in an hour is usually construed as an incremental accomplishment even if the reader has to reread a paragraph every now and then in order to understand the article. Wechsler ([2005](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-366):264–5) notes that *Mary hammered the metal flat* allows for Mary to occasionally hammer the metal in such a way that it becomes less flat, as long as the overall progression is toward flatness and flatness is reached. In addition to some backtracking along the *q* dimension, one can also take breaks: in the hour that I take to read the linguistics article, I can stop reading and have a cookie before going on to finish the article; and Mary can stop and take a drink of water before finishing hammering the metal flat. However, the extent to which backtracking and taking breaks is allowed depends on the event (see also §[3.2.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-12)). It is not clear that playing a musical work such as Chopin's *Polonaise‐Fantaisie* is an incremental accomplishment if the pianist repeatedly stops and goes back twenty to thirty bars and resumes playing, even if the pianist does eventually reach the end of the work. One would probably say rather that *I got through* (p.64) *the* Polonaise‐Fantaisie, a nonincremental accomplishment construal of the event.

Rothstein argues that since some degree of backtracking and breaks are allowed for at least some (incremental) accomplishments, then they are essentially no different from what we are calling nonincremental accomplishments (Rothstein [2004](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-305):91–122; see p. 115 for a succinct statement). Rothstein's analysis treats both aspectual types alike: there is an activity to which is associated a BECOME event which has a ‘developmental structure’ and culminates in the transition to the result state (p. 112). There is no inherent difference between the activity involved in reading a linguistics article and the activity involved in repairing a computer.

But Rothstein's analysis loses some important structure in incremental accomplishments (and also directed activities, which lack the culmination phase). Incremental accomplishments such as reading a linguistics article do have measurable progress even if some backtracking and breaks in the time course of the incremental accomplishment are allowed: at a certain point, I can say that I am three‐quarters of the way through the linguistics article, even if I had a couple of cookies and took a break to answer the phone while I was reading it. This is true because of properties of the linguistics article, namely that it is defined as successive units of text, and properties of the reading process, namely that I more or less read through it from beginning to end (not counting backtracking and breaks). And as we have noted, some incremental accomplishments such as performing a piece of music are much stricter about disallowing backtracking and breaks. The measurability of the progress of the event is a property of the *q* dimension. In contrast, repairing a computer consists not just of possible backtracking and breaks, but of possible dead ends which appear to involve measurable progress but not measurable progress toward the result state. The *q* dimension for repairing a computer does not consist of a scale representing continuous measurable progress toward the result state in the way that the *q* dimension for reading something does. This difference in the structure of the *q* dimension holds even if our construal of an accomplishment as incremental allows for some backtracking and breaks in execution in some cases.

The result state of a bounded durative process may be a transitory state or a permanent one. Mowing the lawn has a transitory result state: the grass will grow back and it can be mowed again. A destructive transformation event such as grinding a stone into grit has a permanent result state: the stone can't be reconstituted. Repairing a computer is a nonincremental accomplishment that has a transitory result state: the computer can break again. Dying has a permanent result state, at least under the cultural assumption that we only live once.

(p.65) The *t/q* phasal representation provides a framework for systematically capturing the range of aspectual types that have been documented in the aspectual literature. States are differentiated by differences in the duration of the profiled state on *t*: point, interval, entire scale. Inherent states are distinguished from all other aspectual types, states or otherwise, by lacking a prior rest state as well as lacking any other distinct phase; that is, only one point is defined on the *q* dimension.[6](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-note-11) Reversible achievements, irreversible achievements, and cyclic achievements (semelfactives) represent punctual transitions to each of the three types of states. There are two types of durative processes, depending on whether or not incremental change is involved, i.e. incremental vs. cyclic changes in the *q* dimension. (Incremental) accomplishments and nonincremental accomplishments represent temporally bounded versions of the two types of activities, directed and undirected respectively.

In principle, more complex profiles over more complex aspectual contours can be defined with the *t/q* phasal model. Some of these more complex contours will be necessary in order to define morphologically derived and periphrastic constructions including simple verb stems (e.g. *start to run* profiles the inception transition phase to the running undirected activity; see §[3.2.3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-13)). The types presented above, however, are the simplest aspectual types definable: they profile only one phase (the different types of states, achievements, and activities), or a temporally bounded dynamic phase (process). Achievements are bounded processes in which the inceptive and completive transitions coincide. There is a constraint, presumably based on a human understanding of the real world, against permanent processes (i.e. all processes are stage‐level), hence the absence of that aspectual type. In other words, simple predicates appear to have the aspectual potential to be construed in all and only these simple types. In this respect, the aspectual types reported in the aspectual literature do form a coherent class. In this respect also, the two‐dimensional representation of aspect naturally captures this fact.

There is one exception to this generalization. The two‐dimensional representation implies that a temporally bounded stative phase construal is just as simple as the temporally bounded processual construals, yet this has not been noted in the aspectual literature to my knowledge.

The bounded state construal is possibly the construal required for certain predicates modified by the Container adverbial *in X timeunit*. Sentences such as (47) and (48), where the Container adverbial is applied to accomplishments and to achievements that allow the nonincremental accomplishment (p.66) construal, have the same profiles as the incremental accomplishment and nonincremental accomplishment structures in Figure [2.6](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-7).

(47) I ate the pizza in ten minutes.

(48) He fell asleep in a few minutes.

However, not all uses of the Container adverbial with achievements may require a runup process. In other uses, all that the Container adverbial may denote is that a state lasting X time units holds from some reference point, such as the present moment, to the achievement or inception:[7](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-note-12)

(49) The TV show starts/is starting in five minutes.

(50) The lights will go off in five minutes.

If this analysis is correct, then the aspectual type found with the Container adverbial will be that found in Figure [2.7](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-8)—the “missing” aspectual type.

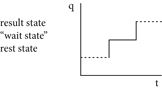


Figure 2.7. A bounded state aspectual type.

Figure [2.7](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-8) represents the aspectual structure of the sentences in (49)–(50) as containing a stative “waiting” phase (waiting for the TV show to start, or for the lights to go off). I am not certain that this is the correct analysis of the semantics of (49)–(50); note for example that (49) is acceptable in the Progressive, generally a characteristic of a profiled process (see §[2.5](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div1-11) and §[4.3.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-4#acprof-9780199248582-div2-22)). If the analysis in Figure [2.7](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-figureGroup-8) is correct, though, then this type completes the inventory of possible minimal aspectual types or construals, according to the *t/q* geometric representation.

**2.4.2 The two‐dimensional model and interval semantics**

Having introduced the *t* and *q* dimensions and shown how the different aspectual types are represented in the two‐dimensional model, we can return to an analysis of the relationship between events and time used in formal semantics, namely the analysis of aspectual types and intervals.

(p.67) Dowty ([1979](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-124), following Bennett and Partee [1972](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-25)) develops an analysis of aspectual types in terms of the truth of propositions over time intervals rather than moments of time. The basic observation is that while a state like *Oscar is happy* is true for any moment in the interval during which Oscar is happy, *John drew a circle* is not true for any moment in the interval during which John drew the circle; it is true only for the entire interval containing the progression and culmination of the circle‐drawing event. States are defined as cases in which the proposition (say, Happy(Oscar)) is true for every proper subinterval of the interval during which Oscar is happy, all the way down to a single moment in time. Conversely, accomplishments fail this test: *John drew a circle* is true only for the entire interval culminating in the completion of the circle, not any (proper) subinterval.

The subinterval criterion essentially distinguishes bounded processes, which fail the criterion, from unbounded states, which pass it. But this is only a two‐way distinction. Activities are unbounded, and therefore subintervals of activities (e.g. running) are also running; but the subinterval criterion eventually fails since activities involve change and therefore are not identical at each moment during the interval. Dowty's definition of activities qualifies the subinterval criterion ‘down to a certain limit’ (Dowty [1986](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-125):42). Conversely, achievements are (near‐)punctual changes of state. Achievements, being bounded, should fail the subinterval criterion, but they do not have subintervals. Dowty argues that no change of state is truly punctual, and in fact sentences with achievement predicates may also describe a runup process (what we have called nonincremental accomplishments). However, in discourse any possible subintervals of achievements may be irrelevant: ‘we do not normally understand [achievements] as entailing a sequence of sub‐events, given our usual every‐day criteria for identifying the events named by the predicate’ (1986:43). In other words, Dowty argues that achievements are really accomplishments, or at least are durative; but they are normally construed as punctual.

The subinterval criterion in this interval semantic analysis of aspectual properties succeeds in distinguishing accomplishments from states because it simultaneously distinguishes bounded and unbounded events and (internally homogeneous) states from (internally heterogeneous) processes on time intervals. It is problematic when applied to activities, which are unbounded yet processes (internally heterogeneous), and when applied to achievements, which are processes but are at least construed as punctual, i.e. lacking subintervals smaller than the instantaneous interval when the change of state occurs. The interval semantic analysis appears to reduce the Vendler categories to just two, bounded processes and unbounded states; achievement construals are attributed to pragmatics, and activities require an additional (p.68) qualification to the subinterval criterion. Interestingly, Cognitive Grammar has essentially the same analysis of what is called there the ‘perfective’/‘imperfective’ contrast: the former is bounded and internally heterogeneous, and the latter is unbounded and internally homogeneous (Langacker [1987](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-243):254–62, [2008](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-246):147).

It is not clear how the subinterval criterion would distinguish point states, which are states true only for a point (i.e. they too lack subintervals), from extended states. The subinterval criterion also does not differentiate directed and undirected activities, or (incremental) accomplishments from nonincremental accomplishments. That requires the notion of progression along a qualitative scale.

The analysis presented in §[2.4.1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-7) introduces a qualitative dimension that allows for the representation of the scale in directed activities and incremental accomplishments. It also allows us to replace the subinterval criterion with a subtler representation of the semantic structure of the event over time. The reason that states hold for every time subinterval down to a single moment is that they are only defined at one point on the *q* dimension: their homogeneity is due to their lack of internal structure on the *q* dimension. This fact about the structure of states on the *q* dimension allows us to distinguish point states, transitory states, and permanent states on the *t* dimension in an intuitive manner.

Accomplishments are bounded on both the *t* and *q* dimensions. In the two‐dimensional model, accomplishments include their inception and completion phases on the *t* dimension in their aspectual profile, and simultaneously include in their aspectual profile both the rest state (as the initial state of the inception phase) and the result state (as the final state of the completion phase) on the *q* dimension. Accomplishments fail the subinterval criterion because any proper subinterval will lack the rest and completion boundary states on the *q* dimension. By this definition of boundedness, nonincremental accomplishments are bounded as well, since their profiled inception and completion transitions include the rest state and result state. Further issues in aspectual boundedness are discussed in §[3.1.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-3#acprof-9780199248582-div2-10).

Activities do not profile their rest state, and there is no result state defined for them on the *q* dimension (let alone profiled by the activity). Activities will conditionally pass the subinterval criterion because they are not bounded, but only conditionally because a small enough subinterval will lack the oscillation between points on the *q* dimension (for undirected activities), or the incremental change on the *q* dimension (for directed activities). Despite being unbounded, activities are not states because they are defined over more than one point on the *q* dimension.

(p.69) Finally, achievements are bounded because their rest state and result states exist on the *q* dimension and are profiled on their aspectual contour (in the quantum leap from one to the other); they are also bounded on the *t* dimension because their inception and completion phases are profiled. The inception and completion are in fact construed as one and the same, i.e. as a punctual event. The definition of boundedness in the two‐dimensional model therefore applies even when there are no temporal subintervals to the event.

In sum, some of the properties of aspectual types that were taken to be properties of the events with respect to temporal intervals are better analyzed as properties of the events with respect to the qualitative changes, or both time and qualitative change (e.g. for boundedness). The structure of the event on the *q* dimension essentially takes the unitary qualitative description of an event in a proposition and analyzes it into component states and scales that allow us to capture many of the semantic distinctions among aspectual types.

**2.5 Conclusion**

In this chapter, we have presented the wide variety of lexical aspectual types that have been described in the aspect literature, going well beyond Vendler's four‐way classification. We have surveyed some of the alternative approaches to the analysis of lexical aspect. The chief shortcoming of these approaches at the outset is that they cannot adequately represent the full variety of lexical aspectual types documented in this chapter. While the approaches capture some insights, such as the relationship among aspectual types and the importance of temporal phase in aspectual analysis, it is possible to develop a richer representation. We present a two‐dimensional geometric representation, with a time dimension and a qualitative state dimension, which is rich enough to represent all and only the aspectual types that have been observed.

Like most other analysts of aspect, we recognize that predicates may belong to different aspectual types depending on the grammatical and discourse context in which they occur; each predicate has an aspectual potential of possible aspectual types or construals it allows. In the next chapter, we describe the relationships among the different aspectual construals of particular predicates.

**Notes:**

([1](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#ref_acprof-9780199248582-note-6)) We assume that in (35) *window* refers to the pane, and not the opening; in the latter sense of *window*, it can shatter each time the pane is replaced.

([2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#ref_acprof-9780199248582-note-7)) The same insights were developed by Jerry Hobbs and myself independently of Timberlake and at approximately the same time. The present model was developed based on that model. Jackendoff ([1996](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-209)) offers a similar analysis of one aspectual type; see §[2.3.2](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#acprof-9780199248582-div2-6).

([3](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#ref_acprof-9780199248582-note-8)) The aspectual contour corresponds to Timberlake's maximal history.

([4](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#ref_acprof-9780199248582-note-9)) We will not discuss various construals of the English Present and Past tenses that allow the point in time to be defined as a more complex function of its relationship to the moment of the speech act.

([5](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#ref_acprof-9780199248582-note-10)) Earlier versions of the taxonomy were presented in Croft [‘1998*c*](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-86), [2009*a*’](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-92).

([6](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#ref_acprof-9780199248582-note-11)) The absence of distinct phases may account for why generics tend crosslinguistically to be expressed by the absence of any tense–aspect marking (Dahl [1995](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-bibliography-1#acprof-9780199248582-bibItem-108):425).

([7](http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199248582.001.0001/acprof-9780199248582-chapter-2#ref_acprof-9780199248582-note-12)) I am grateful to Paul Kay for pointing these examples out to me, though he used them to make a different point.