REVIEW

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Rothstein, Susan. 2004. *Structuring Events: A Study in the Semantics of Lexical Aspect*. Oxford: Blackwell.

This monograph presents a formal theory of aspectual predicate classes (or aktionsarten) and the nature of telicity. Briefly, Rothstein classifies verbs into the four aspectual classes (states, activities, achievements and accomplishments), according to the type of VP they most naturally head. Where a VP and its head verb have different aspectual types, Rothstein proposes that aspectual type-shifting rules apply to the VP, producing a shifted interpretation within which the original sense of the verb is embedded. Rothstein addresses a number of issues which have been prominent in recent research in verbal aspect and event semantics, including the progressives of achievement predicates, the semantics of resultatives, secondary predicates, and the problem of homogeneous singulars, among others. The central theme of the book is the structure of accomplishments, which are the most complex of the aktionsarten.

I shall outline the chapters individually, before turning to further discussion of one or two selected issues.

Chapter 1 ('Verb Classes and Aspectual Classification') introduces the four aspectual classes and diagnostic tests for them. Rothstein classifies verbs (not VPs) as states, activities, achievements and accomplishments, according to their potential for heading VPs of those aspectual types. The four classes are defined by two binary features, [telic] and [stages], as shown in the table below (from p. 192).

	[±stages] = occurs in progressive	[±telic] = naturally heads telic VP
states	–	–
activities	+	–
achievements	–	+
accomplishments	+	+

Verbs classified as [+telic] naturally head telic predicates, but are not actually telic themselves – realized telicity itself is a property of VPs, not of verbs. Accordingly, *'Build a house* and *build houses* are, respectively, telic and atelic VPs headed by an accomplishment verb, and *run to the store*, or *run a mile* are both telic VPs headed by an activity verb' (p. 33-4). The [+stages] feature identifies events which are internally complex or dynamic, 'in the sense that a number of distinct subeventualities need to happen in order for an event of the right type to occur' (p. 193). Dynamic verbs take the progressive, while non-dynamics (states and achievements) resist it.

As Rothstein points out, the feature-based classification predicts that aspectual shifts in only one feature will be more accessible than shifts affecting more than one feature, which appears to be correct. For example, a progressive achievement such as *Alice is arriving at the station* shows an achievement verb heading an apparent accomplishment VP, a change from [-stages, +telic] to [+stages, +telic], and a resultative such as *hammer the metal flat* shows an apparent activity verb heading an accomplishment VP, a change from [+stages, -telic] to [+stages, +telic].

As a preliminary to further discussion, the four aspectual classes are provisionally assigned the templates shown below.

(1) states $\lambda e.P(e)$
activities $\lambda e.(DO(P))(e)$
achievements $\lambda e.(BECOME(P))(e)$
accomplishments $\lambda e.\exists e_1 \exists e_2[e =^{S} (e_1 \cup e_2)\ \&\ (DO(P))(e_1)\ \&\ Cul(e)=e_2]$

P represents the information particular to a verb. DO represents activities, but is not intended to signify agentivity. As the BECOME operator indicates, an achievement is a change of state. Finally, an accomplishment is a singular entity comprising the sum of two subevents, an activity and a culmination.

Chapter 2 ('Progressive Achievements') addresses the problem of achievement verbs in the progressive, as in *Jane is just reaching the summit*. The presence of the progressive indicates that the VP is dynamic, and presumably an accomplishment. Following a presentation of evidence showing that achievements are indeed distinct from accomplishments, Rothstein proposes a rule of aspectual shift, triggered by the presence of the progressive, which adds an unspecified activity before the achievement denoted by the head verb – this produces an accomplishment structure. For example, the basic achievement structure for *The train arrived at the station* is as in (2) below. (Assume that ARRIVE AT THE STATION is an abbreviation of a BECOME structure.) For *The train is arriving at the station*, the VP to which the progressive operator will subsequently apply is shifted to the accomplishment structure in (3). The predicate in (3) describes an accomplishment with an unspecified activity, culminated by the arrival at the station.

(2) $\lambda e.$ARRIVE AT THE STATION(e) & Theme(e) = the train

(3) $\lambda e.\exists e_1 \exists e_2[e =^S (e_1 \cup e_2)$ & $(DO(\alpha))(e_1)$ & ARRIVE AT THE STATION(e_2) & Theme(e_2) = the train & Cul$(e)=e_2]$

For the progressive to be felicitously assertable, the unspecified activity $DO(\alpha)$ must be identifiable as an activity which will develop into an arrival at the station. Pragmatic limitations on this identification explain why the progressive can generally only be used when the achievement event is imminent.

Chapter 3 ('Resultative Predication') deals with the resultative, and lays the main groundwork for a general theory of accomplishment structure in Chapter 4. First, Rothstein requires a consistent account of the semantics of all secondary predicates, both depictives (*He drank his coffee boiling hot*) and resultatives (*He hammered the metal flat*). A review of depictive predicates establishes a general framework which is then shown to apply to resultatives as well.

The central idea is that a secondary predicate introduces an eventive predication with an external argument in addition to the predication of the main verb. The whole event denotation is produced by summing the secondary event and the main event, constrained by the requirement that the subevents be 'Time-Participant Connected'; that is, that the subevents have the same time of occurrence and share at least one participant. This is illustrated with the derived representation for *John drove the car drunk* in (4), where e_1 is the main event (John drove the car) and e_2 is the secondary event (John was drunk).

(4) $\exists e \exists e_1 \exists e_2 [e =^{S} (e_1 \cup e_2)$ & DRIVE(e_1) & Agent(e_1)=John & Theme(e_1)=the car & DRUNK(e_2) & Arg(e_2)=John & TPCONNECT(e_1,e_2,John) & Past(e)]
'There was an event e, consisting of the union of an event e_1 and an event e_2.
e_1 was a driving of the car by John, and e_2 was a state of John's being drunk.
e_1 and e_2 were simultaneous.'

The basic structure for secondary predicates then extends to resultative predicates as follows: the main event is an accomplishment, and Time-Connectedness is satisfied where the time of the secondary event, or result state, coincides with a subevent of the main event – in this case the culmination.

Resultatives are of several kinds, as has been much discussed (see Levin & Rappaport Hovav 1995, 2001, among others). In the simplest kind, the resultative phrase is added to what is already an accomplishment predicate, as in *Mary painted the house red*. Here, the result state ('the house is red') is TP-Connected to the culmination of the existing accomplishment *Mary paint the house*. The state of the house being red occurs at the same time as the end of the painting event, and the house is a participant in both subevents.

More complex resultatives, such as those based on transitive activity verbs (*Mary hammered the metal flat*) or those based on intransitive verbs (*She sang the baby asleep*) require a more complex derivation, as the predicate without the resultative phrase is not already an accomplishment (*Mary hammered the metal*), and may not even be a possible VP *(*Mary sang the baby*). In the presence of the resultative phrase as a trigger, the VP must be shifted to an accomplishment.

For transitive activity resultatives (*Mary hammered the metal flat*), the proposed type-shifting rule simply adds a culmination to the activity and shifts it to an accomplishment, along with the requirement that the theme (or patient) of the activity subevent is also the argument of the culmination subevent. The added culmination subevent is TPConnected to the resultative. Thus *Mary hammered the metal flat* is interpreted as shown in (5).

(5) $\exists e \exists e_1 \exists e_2 [e =^{S} (e_1 \cup e_2)$ & HAMMER(e_1) & Agent(e_1)=Mary & Theme (e_1)=the metal & $\exists e_1$'[Cul(e_1)=e_1' & Arg(e_1'=Theme(e_1) & FLAT (e_2) & Arg(e_2)=the metal & TPCONNECT(Cul(e_1),e_2,the metal)]]
'There was an event e consisting of the sum of e_1 and e_2. e_1 was an activity of Mary hammering the metal, with an added culmination

> e_1'. e_2 was a state of the metal being flat. e_1' and e_2 were simultaneous.'

Intransitive-based resultatives (*Mary sang the baby asleep*) are treated in the same way. A culmination is added to the main event as above, with the requirement that the theme of the main event is also the argument of the culmination. Prior to the shifting operation, the main event (*Mary sing*) has no theme, so in effect the modification adding a culmination also adds *the baby* as an internal argument to the main event. However, because this is a type-shifting rule operating at the VP level, there is no corresponding lexical derivation of a new transitive verb *sing*. Thus *Mary sang the baby asleep* is interpreted as reporting a derived accomplishment 'Mary sang the baby', the culmination of which is simultaneous with a state of the baby being asleep.[1]

Chapter 4 ('The Structure of Accomplishments') presents the central theory of the general structure of accomplishments, drawing on the results of previous chapters. Rothstein begins by reviewing the significance of the incremental theme in accomplishment structures. The incremental theme is generally considered to be the theme argument which undergoes a gradual, progressive change of state, as in *eat the apple*, where successive parts of the apple are eaten in turn. Krifka (1992, 1998) gives a detailed formal account of telicity in terms of incremental themes – briefly, ordered parts of the event are mapped to ordered parts of the incremental theme, giving a homomorphism between the theme and the event. If the theme is quantized (of a given specific extent) as in *John ate the apple*, then at some point it is 'used up' by the activity of the event and the event must terminate. This is the basis of telicity in Krifka's account. On the other hand, if the theme if not quantized, as in *John ate porridge*, there is no specified point at which the theme is used up, the event has no set finishing point, and the predicate is atelic.

Rothstein argues that the notion of incremental theme which is central in existing accounts of accomplishments and telicity is not sufficiently general – it fails to cover numerous accomplishment predicates for which the structure of the event is not given by the ordered and gradual involvement of parts of the theme, such as *repair the computer* and *dry the clothes*. Rothstein proposes a more general notion of incremental theme: 'the extent of some change happening to the theme determines the extent of the event', and 'the incremental theme of an event e is the argument of the event which is the culmination of e' (p. 100). Accordingly, culminations are central to the notion of telicity.

Rothstein considers and rejects three notions of culmination, concluding

that a culmination is 'the final minimal event in an incremental process' (p. 106), where an incremental process is an extended BECOME event. In an accomplishment structure, an incremental process simultaneously accompanies an activity, where the theme of the process is identified with the theme (or patient) of the activity. The ordered parts of the incremental process are mapped to the corresponding parts of the activity, the whole event thus 'inheriting' from the BECOME process the structure of development towards a specified finishing point. Simply, Rothstein's incremental process replaces Krifka's incremental theme argument as the source of the accomplishment structure.

The template for accomplishment events is given in (6) below, where the BECOME event is interpreted as '(i) a change of state (ii) which happens to the theme participant in the activity event, (iii) while the activity event is going on' (p. 108-9). The clause 'INCR(e_1,e_2,C(e_2))' says that the parts of the activity event e_1 and the parts of the change-of-state event e_2 are related by an ordered one-to-one mapping.

(6) $\lambda y \lambda e.\exists e_1,e_2[e = {}^{S}(e_1 \cup e_2)$
& $\text{ACTIVITY}_{<x>}(e_1)$ & $\text{Agent}(e_1) = x$ & $\text{Theme}(e_1) = y$
& $\text{BECOME}_{<y>}(e_2)$ & $\text{Arg}(e_2) = \text{Theme}(e_1)$
& $\text{INCR}(e_1,e_2,C(e_2))]$

The specific nature of the BECOME event may be derived from the activity; for example, 'the BECOME event associated with *read 'War and Peace'* will be BECOME-READ(e_2) & Arg(e_2)=Theme(e_1)' (p.109).

Verbs which alternate between activity and accomplishment uses (*read the book for an hour/in an hour*) are analysed as basic activities, which are associated with a BECOME-READ event in their accomplishment uses.

Chapter 5 ('The Interpretation of Derived Accomplishments') provides a detailed discussion of issues of interpretation and pragmatic constraints on derived accomplishments, that is, progressive achievements and activity-based resultatives.

In Chapter 6 ('Quantization, Telicity, and Change') and Chapter 7 ('Telicity and Atomicity'), Rothstein addresses the general nature of telicity. Chapter 6 reviews Krifka's definition of quantization in terms of non-cumulativity, and the main difficulty for this account: there are NPs which are both quantized and also cumulative. First, quantifiers such as *some* or *at least three* form quantized NPs which appear as direct objects in accomplishment predicates, as in *John ate some/at least three apples in three minutes*. However, they are

also cumulative: some apples combined with some apples gives a collection which is also in the denotation of *some apples*. Second, nouns like *sequence* and *quantity* are also both quantized and cumulative. For example, *John wrote a sequence of numbers in a few seconds* is an accomplishment sentence, indicating that *a sequence of numbers* is quantized, but a sequence of numbers added to another (adjacent) sequence of numbers forms a single sequence of numbers. Rothstein concludes that quantization is not the key to telicity.

Chapter 7 presents Rothstein's alternative analysis of telicity as based on countability: 'A VP is telic if it denotes a set of countable events, and a set of entities P is countable if criteria are given for determining what is an atomic entity in P' (p. 157). This is not the same as the familiar comparison between telic/atelic predicates and count and mass NPs. In earlier work, Rothstein (1999, 2001) has argued that all verbal predicates denote singular entities, in contrast with bare adjectival predicates which have mass denotations. For example, *I made Mary be angry three times*, with the embedded verbal predicate *be angry*, is ambiguous between three 'making' events and three occasions of Mary being angry. In contrast, *I made Mary angry three times* with the embedded adjectival predicate *angry*, is unambiguous, and can only mean that there were three 'making' events. This demonstrates that verbal *be angry* is countable, while adjectival *angry* is not.

Given this distinction, and the assumption that all verbal predicate denotations are countable in the traditional sense, the kind of countabiltiy on which telicity rests must be different. Here Rothstein distinguishes between singular count predicates and atomic predicates. Atomic predicates are those for which a criterion of individuation is lexically fixed, and atomic predicates are neither homogeneous not cumulative.

The distinction between traditional countabiltiy and atomicity is easily demonstrated with nominals. Count nouns such as *dog* are atomic: dividing a dog into two parts cannot produce two dogs, and grouping two or more dogs cannot produce something in the denotation of the singular noun *dog*. The criteria for individuating dogs are part of the sense of the word. Nouns such as *fence* or *lawn*, on the other hand, are morphologically singular, but are both homogeneous and what Rothstein defines as S-cumulative ('singular-cumulative'). With an S-cumulative predicate, a P plus a P forms a (larger) P. For example, two fences in continuous placement form a single longer fence (cf. *sequence of numbers*), and the NP *a fence* is S-cumulative. Conversely, part of a fence may be moved to a separate location, forming two fences from the original single fence, and so *a fence* is homogeneous. The criteria for

individuating a single fence are contextual and variable. Considered as a continuous border round a plot of land, a stretch of fencing material may be construed as one fence, but the same thing viewed as the property of four different owners may be construed as four fences joined. Thus nouns like *fence* can be considered atomic (that is, having a criterion for individuation) only with reference to a specific context. If the context is fixed, alternative ways of individuating fences are not relevant, and then *fence* is not homogeneous or cumulative.

In the verbal domain, atelic predicates are those which are S-cumulative, like *run*: two stretches of running in temporal contiguity form one longer stretch of running. Thus atelic predicates are aligned with S-cumulative NPs like *a fence*, rather than with mass NPs like *sand*. Telic predicates are atomic – they may be naturally atomic, like *run two miles* (no part of a two-mile run is itself a two-mile run), or atomic in context, like *run to the store*.

In order to analyse *run to the store* as atomic (and therefore telic), Rothstein must deal with the fact that *run to the store* is to some extent homogeneous (see e.g. Krifka 1992, p. 34-6): every part of a run to the store which includes the endpoint is itself a run to the store. Here Rothstein's contextual atomicity comes into play. With a particular use of *run to the store*, assuming that the start point of the run is given by context, the route is of the form 'from x to y', and not homogeneous.

Rothstein argues that achievements are naturally atomic because they are of the general form of a minimal transition from $\neg\phi$ to ϕ. Accomplishments are atomic in virtue of the BECOME event, described as a change from φ to ϕ in the structure below.

(7) $\varphi \mid \overline{\neg\varphi \qquad\qquad \neg\phi} \mid \phi$

The point of transition from φ to $\neg\varphi$ is provided by context, the transition to ϕ is the culmination, and consequently in a particular context the extent of change is uniquely fixed.

Chapter 8 ('Event Structure and Aspectual Classification') reviews two outstanding issues. First, semelfactives (*jump, wink*) are defined as activity predicates associated with a natural atomic function which identifies the minimal event falling under the predicate (a single jump, a single wink). Including semelfactives under activities preserves the four-way classification defined by the features [±stages], [±telic]. Second, Rothstein clarifies why achievement and accomplishment predicates cannot be S-cumulative. Briefly, S-cumulativity

requires temporal contiguity – two runs form a single run only if they are temporally continuous. The key characteristic of achievements and accomplishments is change, respectively, instantaneous change from $\neg\phi$ to ϕ and extended change from φ to ϕ. Immediately after ϕ is reached, another transition to ϕ is impossible without an intervening change back to $\neg\phi$. Thus two achievements or two accomplishments under the same (contextualized) predicate cannot be temporally adjacent, and thus S-cumulativity is impossible. Changes which are not defined as transitions to ϕ, however, are repeatable, and their predicates are S-cumulative. This accounts for the atelic senses of gradual change-of-state verbs such as *cool* and *darken*.

Finally, Rothstein summarizes the main findings. The aspectual classes arise from basic event characteristics. The feature [±telic] divides events into change and non-change. Any change of the form of a transition to ϕ is not immediately repeatable, and thus the corresponding predicates (achievements and accomplishments) cannot be S-cumulative, and are telic. Other predicates (states and activities), although they have singular denotations, are S-cumulative and thus atelic. States and achievements are not extended, and have no 'interiors' – although a state may hold at an interval, it can hold at an instant. Thus states and achievements have no internal stages, and lack the progressive. Activities and accomplishments, on the other hand, have essential internal structure or stages, and take the progressive. One of the main innovations is the distinction between singularity and atomicity, and the demonstration that the telic/atelic distinction in VPs does not correlate with the count/mass distinction in NPs. Rather, atelic VPs correspond to the somewhat unusual nouns like *fence* which are both countable and S-cumulative, while bare adjective predicates correspond to mass NPs.

I take the opportunity here to comment further on one or two general issues which arise in Rothstein's theory, and in other recent discussion of the structure of accomplishments.

From the discussion in Chapter 1, it is clear that Rothstein addresses the Vendlerian, temporally-based notion of accomplishments, signalled by the event-duration interpretation of *in* adverbials and the *take* time construction, among other tests. Other tests that Rothstein does not discuss are tests for graduality or proportionality, such as modification by proportional expressions like *half/halfway*, and an 'incomplete event' interpretation with *almost*. These are illustrated in (8) below.

(8) a. Mary half-read the novel / Mary read the novel half-way.
b. Mary read half the novel.
c. Mary almost read the novel.
d. Mary almost touched the live wire.

The close paraphrase relation between (8a) and (8b) demonstrates the frequently claimed mapping between the extent of the event and the extent of the incremental theme argument (see e.g. Krifka, 1992, 1998, Tenny 1994). More generally, the interpretation of a proportionally modified predicate as denoting a proportion of a potential event demonstrates the complex structure of the event as a culminated process. The contrast between (8c) and (8d) makes the same point. The accomplishment predicate in (8c) allows two readings for *almost*. The first, characteristic of accomplishments, is that Mary read most of the novel. The second, 'counterfactual' reading is that there was a high probability that Mary would read the novel but in fact she did not. The achievement predicate in (8d) allows only the counterfactual reading, because a *touch the wire* event does not have enough internal structure to allow the 'incomplete event' interpretation.

The range of predicates identified as accomplishments by the 'process + endpoint' structure, and by the tests cited here, includes at least those in (9) below. I leave it to the reader to verify that all these predicates are accomplishments on traditional assumptions.

(9) a. creation/destruction verb + incremental theme
eat the apple, build a sandcastle
b. change-of-state verb + incremental theme
mow the lawn, paint the fence
c. change-of-state verb + holistic theme
dry the clothes, cool the soup
d. change-of-state verb + theme, 'action script' event structure
repair the computer, alter the jacket, examine the patient
e. motion verb + path NP
climb the mountain, cross the field
f. 'directed activity' verb + theme
read the novel, play the sonata, recite the poem
g. motion verb + *to* goal
run to the store
h. motion verb + measure phrase
run a mile

i. resultatives
paint the fence red, hammer the metal flat, sing the baby asleep.

The range of accomplishments presents a difficulty for the construction of a unified theory of accomplishment structure, as the event components seem to contribute to the aspect of the event in different ways, especially in whether the event is bounded by (i) the exhaustion of a given measure or (ii) the attainment of a specified endstate. Accepting for the moment that these bounding types are different, we might group the predicates as follows.

The exhaustion of a given measure is apparent in the predicates listed in (10). The measure is provided by the incremental theme in (a) and (b), by the action script in (d), by the path NP in (e), by the traversed theme in (f), and by the measure phrase in (g).

(10) a. creation/destruction verb + incremental theme
eat the apple, build a sandcastle
b. change-of-state verb + incremental theme
mow the lawn, paint the fence
d. change-of-state verb + theme, 'action script' event structure
repair the computer, alter the jacket, examine the patient
e. motion verb + path NP
climb the mountain, cross the field
f. 'forwards-directed activity' verb + 'traversed' theme
read the novel, play the sonata, recite the poem
g. motion verb + measure phrase
run a mile

Predicates which appear to be primarily bounded by the attainment of a specified endstate are those in (11). For example, a *dry the clothes* event terminates when the clothes are dry, regardless of how much drying was required, and a *run to the store* event terminates when the runner is at the store, regardless of how far he or she ran.

(11) c. change-of-state verb + holistic theme
dry the clothes, cool the soup
g. motion verb + *to* goal
run to the store

The difference between the types of bounding is particularly evident with deadjectival verbs in examples such as *The solution cooled by five degrees* and

The solution cooled to sixty degrees. In the first case, we know the measured extent of the change but not the endstate – that is, we don't know what temperature the solution was at the end of the event. Conversely in the second case we know the endstate – the final temperature of the solution – but not the extent of change required to reach it. The contrast is also evident with motion verbs and path expressions. In *Jones ran down the lane in two minutes* the telicity required by the *in* adverbial must be given by the measure of the lane, and it is understood that Jones ran the full length of the lane. But if an alternative bound is provided, as in *Jones ran down the lane to the courthouse in two minutes*, the event is bounded by Jones reaching the courthouse, the lane as measure is not required, and it is not understood that Jones ran the length of the lane.

One of the main underlying tensions for unified theories of accomplishment structure is the need to assimilate one of these types of bounding to the other. I see Rothstein's approach as incorporating elements of both types, and will explore some of the consequences here. I consider first the issue of bounding by the attainment of a specified endstate, associated with change-of-state events.

As above, Rothstein defines the general structure of accomplishments in terms of the BECOME operator, recalling Dowty's use of this operator for change-of-state events. BECOME takes as its argument the endstate subevent, and thus BECOME events would seem to be bounded by the attainment of a specified endstate. Some of Rothstein's discussion indicates that BECOME is intended as an indicator of specified change of state. For example, in discussing *hammer the metal flat* Rothstein observes that *hammer the metal* cannot provide the content of a BECOME event because '[h]ammering does not necessarily bring with it any change of state in the object being hammered: if the hammering is not strong enough or the object hammered is hard enough, the hammering can leave no mark at all' (p. 125). The commitment to change of state as the content of the BECOME operator is also clear in Rothstein's definition of a BECOME event as having the structure noted above and repeated here, showing that the onset of the state ϕ terminates the event.

(12) $\varphi \mid \overline{\neg\varphi \qquad\qquad \neg\phi} \mid \phi$

As noted above, the definition for accomplishments also states that the theme (or patient) of the activity must be the argument of the change of state. It follows that all acomplishment events must be analysed as changes of state

occurring to the patient/theme argument. Rothstein accepts this consequence in her analysis of *Mary climbed the mountain* as an event 'culminating in an event in which the mountain gets into the "climbed-by-Mary" state' (p. 142), and a parallel analysis for *read the book*, in which the book attains a "read-by-agent" state. Rothstein comments on these kinds of predicate that '[t]he only information that there is about the argument of the activity is precisely that it is the argument of the activity, and thus the only content which can be supplied for the content of the BECOME event is that it is a change of state in which the participant "undergoes" the activity event' (p. 109).

Here the notion of change-of-state is considerably broadened to include, one might argue, the same kind of state as the 'experiential' result state of existential perfects. For example, the truth of *Dunedin has had snow in December* places Dunedin in the state of having had snow in December. I point out that any hammering event will also establish the corresponding experiential state for the patient argument – as soon as *Thora hammered the pot* is true, the pot has attained a hammered-by-Thora state, and this is inconsistent with Rothstein's discussion of *hammer the metal (flat)*. In fact experiential states as the result states of existential perfects are very hard to pin down – does *Jones passed the kiosk on his way to work* put the kiosk in the passed-by-Jones state? If not, why not?

It is clear that becoming in the passed-by-Jones state or the hammered-by-Thora state do not constitute instances of Rothstein's intended BECOME events, because these transitions are not incremental, and don't proceed gradually towards the final $\neg\phi$-to-ϕ transition. But this objection highlights what appears to be the real function of BECOME in Rothstein's analysis, which is to represent bounded incremental events. But not all such events are changes of state.

Suppose we agree with the more traditional intuitions that (i) the BECOME operator denotes a change to a specified state, (ii) *climb the mountain* and *read the book* are not events in which the mountain and the book undergo changes of state, and (iii) *mow the lawn* and *dry the clothes* are events in which the theme undergoes a change of state. The consequence is that we cannot give a consistent BECOME definition for both kinds of predicate.

Whether or not the BECOME analysis also in principle excludes motion+goal predicates is not clear-cut. Intuitively, an event denoted by *Jones ran to the store* does not seem to be conceptualized as an event in which Jones gradually became at the store, although it may be an event terminated by the final transition of Jones coming to be at the store.[2] Nevertheless, the final

transition is not a candidate for Rothstein's incremental process denoted by BECOME, and so *run to the store* is apparently not an accomplishment in her theory. I return to this predicate presently.

Setting aside the notion of bounding by the attainment of a specified endstate, the alternative candidate for the basis of accomplishment structure (and telicity) is the notion of exhaustion of a given measure, as formalized in Krifka (1998). Given the appropriate rules for mapping event extent from different event components (e.g. the apple in *eat the apple*, the novel in *read the novel*, the path up the mountain in *climb the mountain*, the area of the lawn in *mow the lawn*, and the action script for *repair the computer*), this strategy already covers a range of accomplishment predicates. Hay, Kennedy, & Levin's (1999) analysis of gradual change-of-state verbs (Dowty's (1979, p. 88) 'degree achievements') offers a way of assimilating change-of-state to measure; briefly, the extent of an event of *The clothes dried*, for example, is given by the *difference value*, or extent of change undergone by the theme. In this case the length of the appropriate part of the property scale for DRY might be compared to the length of a novel in a *read the novel* event.

The idea that a telic event must have a specific measure follows in any case if we wish to retain the rule, as Rothstein does, that telic predicates are non-homogeneous – that is, no proper part of an event denoted by a telic predicate P is also an event under the predicate P. For example, no proper part of an event of Jones running a mile is itself an event of Jones running a mile. Rothstein (p. 168-9) addresses this issue by adding a contextually given start point for *run to the store*, so that the predicate in a given context denotes the running of a specific distance, in which case it is non-homogeneous. In this strategy, *to the store* functions not primarily as an expression of endstate ('x is at the store'), but as an expression of specific measure, assimilated to (run) *a mile* and (run) *for two minutes*.[3]

Rothstein's proposal of a contextually given start point recalls a point I raised earlier. In *The solution cooled by five degrees* we know how much it cooled (the measure) but not the final temperature (the endstate), while in *The solution cooled to sixty degrees* we know the final temperature but not how much it cooled by. But if we assume a contextually given start point for both events (in a contextualized use of the predicate), then we know or can infer the measure in both events, although we still know the endstate in only one. In fact, Rothstein adopts this position, proposing that the starting point in a BECOME event 'is a contextually determined point in $\neg\phi$ which is the last point at which ϕ is true' (p. 171). Consequently, the BECOME event has a

specified extent of the form 'from x to y', and 'the temporal extent of the BECOME event will determine the temporal extent of the accomplishment as a whole' (p. 171).

In short, the 'contextual start point' strategy allows endstate-bounded events to be assimilated to measure-bounded events, and it isn't clear what aspectual contribution is made by the notion of change of state, normally denoted by the BECOME operator.

This suggests that the 'measured path' image of accomplishments is the best candidate for a general theory of the structure of accomplishments, as it allows for all the predicates of durative events with a specified culmination to be included, not only those that may be analysed as change-of-state predicates. I take Krifka (1998) to be a 'measured path' theory, in which the part structure of an event, including its endpoint, is mapped from the extent of an appropriate participant in or component of the event. The source of the event structure includes, but is not confined to, the extent of change in a change of state.

Despite my reservations about the status of the BECOME operator, this is an important and highly original contribution to the theory of aspect and event structure. Perhaps the most striking contribution is the detailed analysis and exposition of the distinction between singular and atomic predicate denotations, and the clarification of how these relate to the denotations of NPs. Rothstein also provides an extensive analysis of plurality in event predicates, drawing on Landman's work, which I have not had space to comment on here. The unified treatment of secondary predicates, particularly resultatives, is a stimulating contribution to an area of considerable current interest. On many issues, Rothstein provides clear and insightful discussion of alternative approaches to the problems and how other approaches relate to her work. The discussion throughout is clear and explicit, with formalizations given in full and systematically explained, so in addition to the primary contributions to theory, this is an ideal text to introduce senior students or scholars in other areas to the field.

Notes

1 Rothstein's analysis for intransitive-based resultatives in one respect is not best illustrated by *sing the baby asleep*. In intransitive resultatives, the theme of the endstate is not normally an argument of the main verb at all, and so Rothstein proposes that the Shift rule adds *the baby* as an internal argument to the singing activity. But *Mary sang the baby asleep* might be understood to entail 'Mary sang to the baby', in which case *the baby* is arguably an argument of *sing*.

Nevertheless, the point about adding a patient-like argument to the main verb is clear with examples like *The dog barked them awake*.

2 Analyses of the general form [... BECOME[be-at'(Jones, the store)]] are used in Role and Reference Grammar (see Foley & van Valin (1984), van Valin & LaPolla (1997)) and related formalizations.

3 Rothstein proposes that modifiers such as *to the store*, *for two minutes*, and *a mile* 'denote functions from denotations of VPs ... to sets of contextually restricted atomic eventualities' (p. 169). I suggest that the expressions are not alike in the relevance of context: *run a mile* and *run for two minutes* are explicitly measured quite independently of context.

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