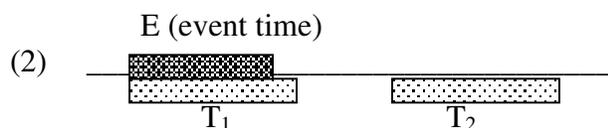


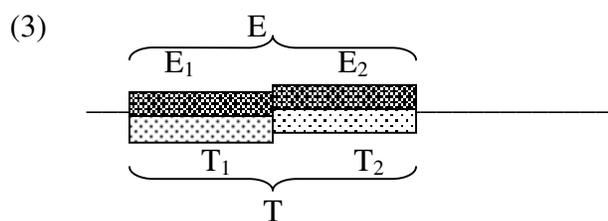
NOTE 1 ASPECT: AN OVERVIEW

- Aspect is concerned with the way events relate to time.
- (1)
- a. *Maya walk to the park*
 - b. *Maya recognize Peter*
 - c. *Maya know French*
 - d. *Maya dance*
- The event-descriptions in (1) are true of events that have not been situated relative to a time line. But we perceive events in the world through the prism of time, and we represent them linguistically as such. So, we can say that the event in (1a) occurs during the time interval T_1 but not during T_2 in (2). Supplying such temporal information is one of the roles of aspect.



- While a temporal location has not been provided for the events described in (1), it is nevertheless clear that there is another kind of temporal information available to us. The different events in (1) have different temporal properties:
 - they take time (cf. (1a), (1c), (1d)), or are instantaneous (cf. (1b));
 - they can be extended in time, in the sense that they can form temporally ordered sub-events of larger events of the same type (cf. (1c), (1d)) or not (cf. (1a), (1b));
 - they can be temporally divided into sub-events such that all such sub-events are events of the same type (cf. (1c)) or not (cf. (1a), (1b), (1d)).

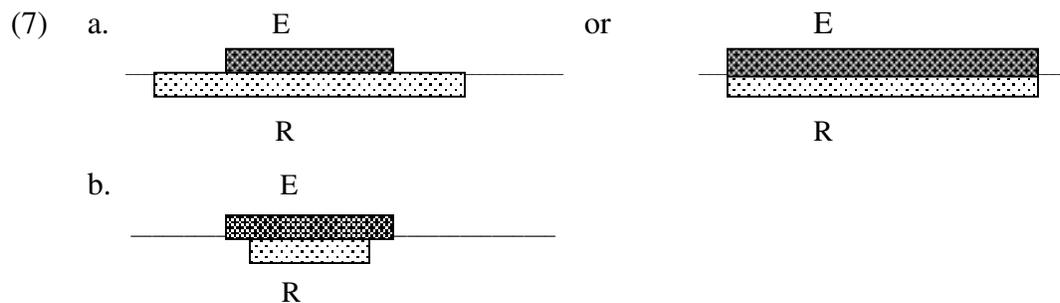
This kind of temporal information is also encoded by aspect.



- A two-tiered theory of aspect:
 - (i) *Viewpoint aspect* (also called *grammatical aspect*, *outer aspect*) locates events in time
 - (ii) *Aktionsart* (also called *situation aspect*, *lexical aspect*, *inner aspect*) concerns the temporal constituency of events
- What are the grammars of viewpoint aspect and aktionsart? How similar/different are they? What is the role of lexical meaning?
- Aspect is at the crossroads of the syntax-semantics interface and the lexicon-syntax interface. Interaction with tense and modality, on the one hand, and argument structure on the other.

1. VIEWPOINT ASPECT

- Viewpoint aspect provides a temporal perspective on events: it locates events relative to a point-of-view (reference) time
 - It's all about the linguistic representation of events, not about the events' inherent properties
- (4) a. Maya walked to the park
 b. Maya was walking to the park
- (5) a. Past ("Viewpoint-Aspect-1" (Maya walk to the park))
 b. Past ("Viewpoint-Aspect-2" (Maya walk to the park))
- The traditional view (e.g., Comrie 1976), similarly Smith (1997):
 - perfective: "looking at the event from the outside"
 - progressive: "looking at the event from the inside"
 - We can represent that basic insight through containment relations between temporal intervals
- (6) a. perfective: Event time (E) *is contained in* Reference Time (R)
 b. progressive: Event time *properly contains* Reference Time



1.1 TESTS FOR THE ROLE OF VIEWPOINT ASPECTS

- Entailment patterns.

(8) a. Maya walked to the park \Rightarrow Maya got to the park
 b. Maya was walking to the park \nRightarrow Maya got to the park

(9) a. # Maya walked to the park but she didn't actually get there.
 b. Maya was walking to the park but she didn't actually get there.
- Interaction with temporal clauses.

(10) a. Maya was walking to the park when the earthquake hit. (simultaneity)
 b. Maya walked to the park when the earthquake hit. (sequencing)

(11) a. Maya was leaving when the bell rang (simultaneity)
 b. Maya left when the bell rang (simultaneity or sequencing)

- (12) a. ?? Maya was walking to the park after the earthquake hit.
 b. Maya walked to the park after the earthquake hit.

- (13) a. ?? Maya was leaving after the bell rang
 b. Maya left after the bell rang

- Durative/inclusive interpretation of certain adverbials.

- (14) a. Between 10 and 11, Maya was walking to the park. (durative)
 b. Between 10 and 11, Maya walked to the park. (durative or inclusive)

- (15) a. Between 10 and 11, Maya was leaving (durative)
 b. Between 10 and 11, Maya left. (inclusive)

- Interaction with completive adverbials (with certain kinds of predicates)

- (16) a. Maya walked to the park *in an hour*.
 b. Maya was walking to the park **in an hour*.

1.2 THE SPACE OF GRAMMATICAL OPTIONS FOR VIEWPOINT ASPECTS

- What are the possible viewpoint aspects? The goal, as in the rest of the generative enterprise, is to uncover the universal constraints on the grammar of viewpoint and the parameters of cross-linguistic variation.

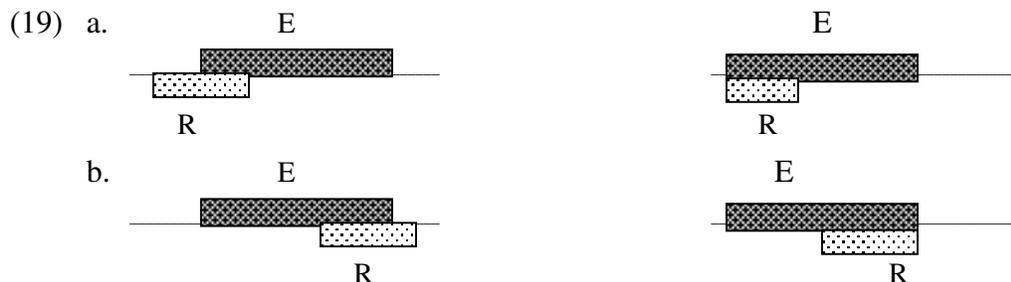
- Note: we are starting with the semantic notion of viewpoint aspect. The aspectual morphology found in the world's languages does not correspond one-to-one to the semantic characterizations that we will provide here. Some issues are particularly pertinent:

- not all aspectual distinctions are expressed in all tenses/moods
- not all semantic aspectual distinctions receive overt morphological expression
- multiple functions of one morphological form
- language-particular naming conventions

- Let's examine the logical possibilities of interval relations:

- (17) a. $E \subseteq R$ perfective (cf. (7a))
 b. $E \supset R$ progressive (cf. (7b))

- (18) a. beginning $E \subset R$ (cf. (19a))
 b. end $E \subset R$ (cf. (19b))



- (20) a. $E < R$ (cf. (21a))
 b. $E > R$ (cf. (21b))



1.2.1 PERFECTIVE AND IMPERFECTIVE/PROGRESSIVE

- Perfective and progressive are the basic viewpoint aspects, and have been described for many languages.
- In many languages, the morphology for progressive aspect also expresses habituality, in a category known as imperfective. This is the case in e.g., Romance, Slavic, Greek.

(22) a. Juan *leyó* el libro (Spanish)
 Juan read_{-PAST.PERFECTIVE.3SG} the book
 ‘Juan read the book.’

b. Juan *leía* el libro
 Juan read_{-PAST IMPERFECTIVE.3SG} the book
 ‘Juan was reading the book.’ / ‘Juan used to read the book.’

(23) a. *Eχtisa* ena spiti (Greek)
 build_{-PAST.PERFECTIVE.1SG} a house
 ‘I built a house.’

b. *Eχtiza* ena spiti
 build_{-PAST.IMPERFECTIVE.1SG} a house
 ‘I was building a house.’ / ‘I used to build a house.’

(24) a. Ivan *sjel* sup. (Russian)
 Ivan ate_{-PAST.PERFECTIVE.MASC} soup_{-SG.ACC}
 ‘Ivan ate up (all) the soup.’

b. Ivan *jel* sup.
 Ivan ate_{-PAST.IMPERFECTIVE.MASC} soup_{-SG.ACC}
 ‘Ivan was eating (the/some) soup.’ / ‘Ivan used to eat soup.’

- How do we account for this syncretism across languages? Is it that progressive and habitual share an aspect of their meaning? Or is that the perfective form is marked, and the imperfective morphology is simply the default? This remains an outstanding problem.
- The syncretism between progressive and habitual does not exist in e.g., Hindi, where, however, another cross-linguistically common syncretism is exhibited – that between habitual and counterfactual. See Iatridou (2000) for details.

- (25) a. Saif-ne ek ghaRaa banaa-yaa (Hindi)
Saif-_{ERG} a pot make-_{PERFECTIVE}
'Saif made a pot.'
- b. Saif ghaRe banaa-taa hai
Saif pots make-_{IMPERFECTIVE} be-_{PRES.SG}
'Saif makes pots.'
- c. Saif ek ghaRaa banaa rahaa hai
Saif a pot make Prog-_{M.SG} be-_{PRES.SG}
'Saif is making a pot.'
- d. Kaash Saif ghaRe banaa-taa
'wish' Saif pots make-_{IMPERFECTIVE}
'I wish Saif made pots.'

1.2.2 NEUTRAL

- Smith (1997:62): "Neutral viewpoint includes the initial point and at least one stage of a situation", i.e., our (18a).
- In the languages Smith discusses – French, Chinese, Navajo, Finnish, Icelandic – neutral viewpoint is expressed through non-overt morphology.
- Iatridou, Anagnostopoulou and Izvorski (2001) propose that Bulgarian has an overt three-way distinction in its aspectual system between neutral, imperfective, and perfective.

- (26) a. Az *stroix* pjasâčna kula. (Bulgarian)
I build-NEUT.PAST.1SG sand castle
'I was engaged in building a sand castle.'
- b. Az *strojax* pjasâčna kula
I build-IMPERF.PAST.1SG sand castle
'I was building a sand castle.' / 'I used to build a sand castle.'
- c. Az *po-stroix* pjasâčna kula.
I *px*-build-PERF.PAST.1SG sand castle
'I built a sand castle.'

- Neutral has properties, which are common with the perfective, and others with the imperfective.
 - It makes reference only to the beginning and the internal temporal structure of an eventuality. Therefore, similarly to the imperfective (26b), and in contrast to the perfective (26c), (26a) does not assert that a sand castle came to exist.
 - It disallows completive adverbials (e.g., 'in two hours'), again behaving like the imperfective and not like the perfective.

- Neutral allows both durative and inclusive interpretation of time intervals (e.g., *between 10 and 11am*), a property it shares with the perfective and not with the imperfective.
 - Similarly to the perfective and unlike the imperfective, neutral sequences with perfective eventualities (e.g., temporal clauses).
- Note that once we understand certain issues concerning the structure of events like *drink the wine*, other analyses for the facts of (26) become available.

1.2.3 “END $E \subset R$ ”

- There doesn't seem to be a candidate for such a viewpoint aspect distinct from the perfective.
- If indeed no such separate viewpoint aspect exists, this suggests that end points of events, and by extension beginning points, are not of interest to viewpoint grammar. Instead, what appears to be the case is that the relevant issue is boundedness.
- On that view, both perfective and neutral impose boundedness. The important difference is not the inclusion/exclusion of the endpoint of the event per se, but rather the inclusion/exclusion of a more primitive component of events – what has been called *change of state* (not to be identified with beginning or end), *target*, *goal* (not to imply intentionality). Some events have such a component ('walk to the park') others do not ('know French') – as we will discuss shortly. For the former kind, neutral provides boundedness without achievement of the goal/culmination, whereas perfective provides boundedness with achievement of the goal/culmination.

1.2.4 “ $E < R$ ”

1.2.4.1 *Perfect*

- The perfect is often characterized as an aspect that encodes the $E < R$ relationship (e.g. Reichenbach 1947, Hornstein 1990; see also Parsons 1990, Klein 1994, Smith 1997, Giorgi and Pianesi 1998, for whom the perfect presents a state of a prior event).
- (27) a. Maya has walked to the park
b. Maya had walked to the park
c. Maya will have walked to the park
- This, however, is not the view we subscribe to (cf. also McCoard 1978, Dowty 1979, Iatridou, Anagnostopoulou and Izvorski 2001, a.o.). We will come back to the perfect in great detail. For now note that E may overlap with R (cf. (28)) and the perfect can embed viewpoint aspect (cf. (29)).

(28) Maya has lived in Northampton since 2003

(29) Maya has been dancing ever since this morning

1.2.4.2 Resultative

- Smith (1997:76) proposes that certain uses of the progressive in English are an example of a resultative viewpoint.

(30) a. Your socks are lying on the bed.
b. The statue is standing in the corner.

- It is, however, not necessary for the sentences in (30) to be describing situations that result from a prior event, calling into question whether we have a resultative here.
- Even if we looked at genuine resultatives, a simple $E < R$ relation is inadequate for capturing their semantics. We need to make reference to a target state resulting from an event.

1.2.4.3 Other possible complex aspects

- A topic of interest is Chinese ‘experiential’ *-guo*, which has been claimed to present events as having culminated, with the resulting target states also terminated (Smith 1997: 71).
- The same point obtains here, as with resultatives. The meaning of experiential *-guo* cannot be represented without reference to a target state resulting from an event.

1.2.5 PROSPECTIVE

- A prospective counterpart of the perfect is sometimes proposed, as encoding the $E > R$ relation, with *be going to* being the English prospective (e.g., Comrie 1976).

(31) a. Maya is going to walk to the park.
b. Maya was going to walk to the park.

- Like the perfect, *be going to* too can embed viewpoint aspect, indicating that it is of a different category from viewpoint aspects

(32) Maya is going to be walking to the park.

1.2.6 IN CONCLUSION

- Not all logically possible options for a viewpoint aspect appear to be attested. Thus, grammar places a constraint on viewpoint aspect, as in (33).

(33) E and R must overlap

1.3 A COMPOSITIONAL ANALYSIS FOR VIEWPOINT ASPECT

- We need to formalize the conclusion that we reached about the role of viewpoint aspect in terms of overlapping relations between temporal intervals
- We will treat ν Ps as predicates of events (cf. (34)). Values for viewpoint aspect are introduced in a dedicated functional head taking ν P as its argument (cf. (35)).

$$(34) \llbracket \nu P \rrbracket = \lambda e_{(v)}.P(e)$$

$$(35) [_{\text{AspP}} \text{Viewpoint Aspect } [_{\nu P} \text{event-predicate}]]$$

- Viewpoint aspects are relations between predicates of events and predicates of intervals (cf. (36)). They existentially quantify over the event variable and situate the event time ($\tau(e)$) in relation to an evaluation interval (what we have been calling a reference time, R).

$$(36) \text{ a. } \llbracket \text{PROGRESSIVE} \rrbracket = \lambda P_{(vt)}. \lambda t_{(i)}. \exists e_{(v)} [t \subset \tau(e) \ \& \ P(e)]$$

$$\text{ b. } \llbracket \text{PERFECTIVE} \rrbracket = \lambda P_{(vt)}. \lambda t_{(i)}. \exists e_{(v)} [\tau(e) \subseteq t \ \& \ P(e)]$$

- Under this view, viewpoint aspects cannot be iterated.
- This confirms that the perfect cannot be a viewpoint aspect, as we suggested above, because it combines with viewpoint aspects.
- This also means that what has been called a secondary imperfective in Slavic cannot simply be a progressive aspect that combines with perfective aspect.

- (37) a. Ivan *stroi* kâšta(ta) (Bulgarian)
 Ivan build-NEUT.PAST.3SG (the-)house
 ‘Ivan was engaged in building a/the house.’
- b. Ivan *stroeše* kâšta(ta)
 Ivan build-IMPERF.PAST.3SG (the-)house
 ‘Ivan was engaged in building a/the house.’ / ‘Ivan used to build a/the house.’
- c. Ivan *po-stroi* kâšta(ta)
 Ivan pfx-built-PERF.PAST.3SG (the-)house
 ‘Ivan built up a/the house.’
- d. Ivan *po-strojavaše* kâšta(ta)
 Ivan pfx-built-2IMPERF.PAST.3SG (the-)house
 ‘Ivan was building up a/the house.’ / ‘Ivan used to build up a/the house.’
- e. *Ivan *strojjavaše* kâšta(ta)
 Ivan built-2IMPERF.PAST.3SG (the-)house
 ‘Ivan was building up a/the house.’

2. AKTIONSART

- Aktionsart is related to the internal temporal constituency of events.
- A traditional view, still endorsed by many, is that aktionsart concerns the ‘inherent temporal features of the lexical content’ (Klein 1994).
- A more recent view is that at least some aspects of aktionsart are structural, and independent of the lexical content (e.g., Borer 1998, 2005, van Hout 2000, Kratzer 2004, Ramchand 1997, 2003, Ritter and Rosen 1998 a.o.)

2.1 EVENT TYPES

- The extended Vendlerian classification of situation types (Vendler 1957, Smith 1997):

(38) a. States:

‘be happy’: Maya is happy.
‘be heavy’: That rock is heavy.

b. Activities

‘dance’: Maya is dancing.
‘walk in the park’: Bill walked in the park.

c. Accomplishments

‘build a house’: The contractor built a house.
‘walk to the park’: Bill walked to the park.

d. Achievements

‘find’: Maya found her watch in the garden.
‘arrive’: Bill arrived in Boston yesterday.

e. Semelfactives

‘cough’: Maya coughed.
‘knock’: Paula knocked on the door.

- A terminological distinction is sometimes made between *states* and *events* (38b-e), with *eventualities*, or *situations* used as a common term for both. More recently, *events* has emerged as a cover term for all.

2.2 DIMENSIONS OF EVENT CLASSIFICATION

- While there are many dimensions along which eventualities can be classified, the following dimensions are particularly relevant (from Smith 1997):

2.2.1 [STATIC/DYNAMIC]

- States are static, though they ‘obtain in time, they do not take time’ (Taylor 1977: 206). Events are dynamic; they are ‘continually subject to a new input of energy.’ (Comrie 1976:49).
- The [static/dynamic] distinction is a basic ontological distinction, still in certain cases the same situation can be described as a state or as an event.

- (39) a. Maya is asleep.
b. Maya is sleeping.

- In English, adjectives can only provide state descriptions, while verbs can provide both state and event descriptions (*know* vs. *write*). A useful test for the state/event distinction in English is that while event descriptions can combine with the progressive, for the most part states cannot.

- (40) a. *Maya is being asleep.
b. Maya is sleeping.
c. *Maya is knowing Leo.
d. Maya is writing a letter.

- (41) a. Maya is standing in front of the museum.
b. The picture is hanging on the wall.

2.2.2 [TELIC/ATELIC]

- The distinction concerns whether or not an event has a change of state associated with it that marks the end of the event. A ‘walk in the park’ event does not have an associated state of this sort, while a ‘walk to the park’ event culminates once the park is reached. The relevant notion is not whether an event terminates or not – most events presumably terminate – but whether a change of state is part of the event description.
- In some cases, the exact point at which the change of state is achieved is partly dependent on contextual assumptions. In (42) (cf. Schein 2002, Borer 2005), the point at which the room counts as filled with smoke is not linguistically represented but we nevertheless have a telic event.

- (42) The room filled with smoke.

- (43) a. Atelic event description + progressive \Rightarrow Atelic event description + perfective
b. Telic event description + progressive \nRightarrow Telic event description + perfective

- (44) a. Maya was walking in the park. \Rightarrow Maya walked in the park.
b. Maya was walking to the park. \nRightarrow Maya walked to the park.

- “...it is misleading to think that particular events can be called “telic” or “atelic”. For example, one and the same event of running can be described by *running* (i.e. by an atelic predicate) or by *running a mile* (i.e. a telic, or delimited, predicate). Hence the distinction between telicity and atelicity should not be one in the nature of the object described, but in the description applied to the object” (from Krifka 1998:207)

- Tests for Telicity
 1. *for-* vs. *in-*adverbials – perfective telic predicates permit *in-*adverbials and not *for-*adverbials. The situation is reversed for atelic predicates which permit *for-*adverbials but not *in-*adverbials.

(45) a. Mary walked to the park *in an hour*/**for an hour*.
b. Mary walked in the park *for an hour*/**in an hour*.

Note: the direction of implicatures with *in* and *for* adverbials is different. (45a) suggests that the walking to the park event did not take less than an hour while (45b) suggests that the walking in the park event did not take more than an hour.

2. Compatibility with ‘finish’:

- (46) a. Mary finished walking to school. (telic)
b. ?Mary finished walking in the park. (atelic)

3. Compatibility with ‘take’ vs. ‘spend’:

- (47) a. It took me an hour to write this letter. (telic)
b. ?It took me an hour to listen to music. (atelic)
c. ?I spent an hour writing the letter. (telic)
d. I spent an hour listening to music. (atelic)

2.2.3 [DURATIVE/INSTANTANEOUS]

- This distinction concerns whether or not an event is conceptualized as having duration or as being instantaneous. Situations conceptualized as instantaneous may nevertheless actually have some duration. For example the event of ‘find her watch in the garden’ may actually have a non-zero transition from the state where the watch has not been found to the state where the watch has been found, but this does not vitiate the distinction. A similar point can be made with respect to semelfactives like ‘cough’ – coughing events certainly have duration but we treat them as instantaneous.

- A feature based classification of the various situation types: (Smith 1997:20)

(48)

	static	durative	telic
state	+	+	–
activity	–	+	–
accomplishment	–	+	+
achievement	–	–	+
semelfactive	–	–	–

- This classification is based on three binary features, and so in principle, we have some unattested cases: nothing can be simultaneously static and instantaneous, or static and telic

2.3 COUNT VS. MASS: PARALLELS BETWEEN INDIVIDUALS AND EVENTS

- Count:Mass :: Telic:Atelic
 (cf. Mourelatos 1978, Hoepelman and Rohrer 1980, Bach 1986, Krifka 1989, Borer 2005)
- For mass objects, a proper part counts as an instance of the whole. For atelic event descriptions, a proper subevent counts as an event of the same kind.
- For countable objects, a proper part does not necessarily count as an instance of the whole. Similarly for telic event descriptions, a proper subevent does not necessarily count as event of the same kind.

(49) Quantization (from Krifka 1998:200)

a. A predicate P is quantized if whenever it applies to an object, it does not apply to a proper subpart of the object.

$$b. \forall X \subseteq U_P [QUA_P(X) \Leftrightarrow \forall x,y [X(x) \& X(y) \rightarrow \neg (y <_P x)]]$$

- In the domain of individuals, Quantized predicates correspond to the countables. In the domain of event descriptions, Quantized predicates correspond to telic predicates.
- The Subinterval Property can be seen as the converse of the Quantization Property.

(50) A predicate P has the subinterval property if whenever P holds of an event/interval, it also holds of every sub-event/sub-interval of that event/interval.

- States have the subinterval property as stated above i.e. when a state holds for an interval, it holds for every subinterval of that state.

- A weakened version of the Subinterval property holds for Activities – if an activity holds for an interval, it holds for all subintervals of that interval, excluding intervals too small for the activity to hold at.

2.4 CONSTRUCTING AKTIONART: INITIAL MOTIVATIONS

- We have seen that activities and accomplishments, and accomplishments and achievements share certain features in common. Activities consist of a process component, achievements of a change of state, and accomplishments of a process component and a change of state.
- One question is what these common features indicate about the relationship between different kinds of aktionsart – is one kind derived from another and if so, at what level of representation – syntactic or semantic – does this derivation take place?

2.4.1 CASE 1: ACCOMPLISHMENTS AND ADVERBIALS

- Adverbials such as ‘almost’ produce ambiguity with accomplishments and more generally with temporally bounded events (cf. Dowty 1979, Parsons 1990, Pustejovsky 1991, Higginbotham 1999).

(51) John almost opened the door.

- a.but then he changed his mind and stopped before he got to the door knob.
- b.but it was too heavy and he was only able to get it to turn a little bit.

- One way of generating these readings is to assume a representation where the adverb can either modify the whole event yielding reading (51a) or just the change of state yielding reading (51b).

2.4.2 CASE 2: PREFIXES AND LIGHT VERBS

- In Slavic, a rich system of prefixes on verbs introduces telicity (cf. Krifka 1992, Piñon 2001, Filip 2000, 2003, 2005, Ramchand 2004, Svenonius 2004, Borer 2005 a.o)

- (52) a. On *z-jadł* kaszę / oliwki. (Polish)
he *px-ate* porridge / olives
‘He ate (up) (all) the porridge / olives.’
- b. On *jadł* kaszę / oliwki.
he ate porridge / olives
‘He was eating (sm/the) porridge / olives.’
‘He was eating some of the porridge / olives.’
‘He ate (sm/the) porridge / olives.’

- In Hindi-Urdu, light verbs seem to introduce telicity (Singh 1998, Ramchand 2003, Butt and Ramchand 2005)

- (53) a. Maya-ne kek khaa-yaa
Maya-Erg cake eat-Pfv
'Maya ate cake/of the cake.'
- b. Maya-ne kek khaa li-yaa
Maya-Erg cake eat TAKE-Pfv
'Maya ate the cake (the cake is finished).'

2.5 ASPECTUAL COMPOSITION

- The role of prefixes and light verbs in influencing the ultimate aktionsart of an event description suggests that aktionsart cannot be completely lexically specified. But the contribution of prefixes is not fully regular. A clearer example of the structural determination of aktionsart comes from the phenomenon that has come to be known as *Aspectual Composition*. The basic facts are illustrated below.

- (54) a. Maya drew a circle on the blackboard. (Accomplishment)
b. Maya drew circles on the blackboard. (Activity)
c. Maya pushed the cart. (Activity)
d. Maya pushed carts. (Activity)

- The aktionsart of event descriptions involving predicates like 'draw' – which have an 'affected theme' – seems to depend upon the nature of their affected theme/direct object. When the direct object is a count expression, we have an accomplishment. Otherwise we have an activity. This has come to be known as *Verkuyl's Generalization* (see Tenny 1994, Borer 2005:73).

- (55) Telic interpretation can only emerge in the context of a direct argument with property α (Theories differ with respect to the exact specification of α , e.g., +SQA (for Verkuyl), +Quantized (for Krifka); +Bounded (for Kiparsky), a.o.)

- The aktionsart of event descriptions involving predicates like 'push' – which do not have an affected theme – does not seem to depend upon their object in a similar fashion.
- A related instance of aspectual composition comes from the effect of prepositional adjuncts on aktionsart.

- (56) a. Maya walked in the park. (Activity)
b. Maya walked to the park. (Accomplishment)

- An initial treatment of these facts (see Smith 1997, see also Verkuyl 1972, 1993, who uses the features [+/-ADD TO] and [+/-SQA]) involves assigning lexical features to verbs e.g.

draw[+telic], push[-telic], and walk[-telic], the direct objects e.g. a circle/the cart[+count] vs. circles/carts[-count], and PPs e.g. in the park[+location] vs. to the park[+direction], and setting up a feature percolation system along the following lines:

- (57) a. [+telic] + [+count] → [+telic]
b. [+telic] + [-count] → [-telic]
c. [-telic] + [+/-count] → [-telic]
d. [-telic] + [+location] → [-telic]
e. [-telic] + [+direction] → [+telic]

- Note that under reasonable syntactic assumptions, the aspectual status of (58b) does not follow from the above system.

- (58) a. Maya pushed the cart to the library. (Accomplishment)
b. Maya pushed carts to the library. (Activity)

- Ultimately though, the motivation of these features is semantic and we expect the feature percolation schemas shown above to follow from the semantics of the elements involved and general principles of semantic composition.

2.6 ASPECTUAL COMPOSITION AND AN ALGEBRAIC APPROACH TO TELICITY

- Krifka (1998):

(59) Semantic composition

- a. eat apples: $\lambda x,e \exists y [\text{Apples}(y) \ \& \ \text{Eat}(x,y,e)]$
b. eat two apples: $\lambda x,e \exists y [2\text{Apples}(y) \ \& \ \text{Eat}(x,y,e)]$
c. push carts: $\lambda x,e \exists y [\text{Carts}(y) \ \& \ \text{Push}(x,y,e)]$
d. push two carts: $\lambda x,e \exists y [2\text{Carts}(y) \ \& \ \text{Push}(x,y,e)]$

- The semantic representations in (59a-d) do not directly reveal why there is an aktionsart contrast between (a) and (b), but not between (c) and (d).
- The direct object in (59b/d) is ‘quantized’ and not ‘cumulative’, the direct object in (a/c) is ‘cumulative’ and not ‘quantized’.

(60) Quantization:

$$\forall X \subseteq U_P [\text{QUA}_P(X) \Leftrightarrow \forall x,y [X(x) \ \& \ X(y) \rightarrow \neg (y <_P x)]]$$

- Proper subparts of apples/carts can be apples/carts.
- Proper subparts of ‘two apples’/‘two carts’ can’t be ‘two apples’/‘two carts’.

(61) Cumulativity:

$\forall X \subseteq U_P [CUM_P(X) \Leftrightarrow \exists x, y [X(x) \& X(y) \& x \neq y] \& \forall x, y [X(x) \& X(y) \rightarrow X(x \oplus_P y)]]$

- books/carts added to books/carts respectively are books/carts.
- ‘two books’/‘two carts’ added to ‘two books’/‘two carts’ respectively are not ‘two books’/‘two carts’ respectively.

- The relation between the object argument and the event argument of ‘eat’ is strictly incremental and cumulative.

(62) Strict Incrementality:

$SINC(\Theta)$ iff (i) $MSO(\Theta) \& UO(\Theta) \& MSE(\Theta) \& UE(\Theta)$

(ii) $\exists x, x', e, e' [x' < x \& e' < e \& \Theta(x, e) \& \Theta(x', e')]$

(63) Mapping to subobjects:

$MSO(\Theta)$: If $\Theta(x, e)$ and e' is a proper subevent of e ,
then there is a proper subpart of x, x' , s.t. $\Theta(x', e')$

(64) Uniqueness of Objects:

$UO(\Theta)$: If $\Theta(x, e)$ and e' is a subevent of e ,
then there is a unique subpart of x, x' , s.t. $\Theta(x', e')$.

- Note: $MSO(\Theta)$ and $UO(\Theta)$ together entail that we cannot have $\Theta(x, e), e'$ a proper subevent of e , and $\Theta(x, e')$ together.

(65) Mapping to Subevents:

$MSE(\Theta)$: If $\Theta(x, e)$ and x' is a proper subpart of x ,
then there is a proper subevent of e, e' s.t. $\Theta(x', e')$.

(66) Uniqueness of Events:

$UE(\Theta)$: If $\Theta(x, e)$ and x' is a proper subpart of x ,
then there is a unique subevent of e, e' s.t. $\Theta(x', e')$.

- In contrast, the relation between the object argument and the event argument of ‘push’ is not strictly incremental - this relation for ‘push’ does not satisfy Mapping to Subobjects. If a cart is pushed during an event, it can be pushed during a proper subevent too. This is not possible for ‘eat’. If an apple is eaten during an event e , only a proper subpart of the apple can be eaten during a proper subevent of e .

(67) Cumulative \rightarrow Atelic

Quantized \rightarrow Telic

- ‘eat apples’ is cumulative, ‘eat two apples’ is not:

- (68) Proof: Assume (i) (x,e) falls under ‘eat apples’: i.e., $\exists y$ [Apples(y) & EAT(x,y,e)]
(ii) (x,e') falls under ‘eat apples’: i.e., $\exists y'$ [Apples(y') & EAT(x,y',e')

By cumulativity of Apples, it follows that Apples($y \oplus y'$)

By cumulativity of EAT, it follows that EAT($x, y \oplus y', e \oplus e'$)

Hence ‘eat apples’ is cumulative.

- Since ‘two apples’ is not cumulative, ‘eat two apples’ also fails cumulativity (summing two events of ‘eat two apples’ does not in general yield an event of ‘eat two apples’.)
- ‘eat two apples’ is quantized:

(69) Proof:

We want to prove that if (x,e) falls under ‘eat two apples’ then there is no proper subevent of e , e' , s.t. (x,e') also falls under ‘eat two apples’. To do so, let’s assume the converse that (x,e) falls under ‘eat two apples’ i.e., $\exists y$ [2Apples(y) & eat(x,y,e)], that (x,e') falls under ‘eat two apples’ i.e., $\exists y'$ [2Apples(y') & eat(x,y',e')], and that e' is a proper subevent of e .

By Mapping to Subobjects, we can derive that there is a proper subpart of y , y'' s.t. EAT(x, y'', e'). But by Uniqueness of Objects, it must be the case that $y' = y''$. This means that y' is a proper subpart of y and 2Apples(y'). But this is a contradiction because 2Apples is quantized.

- ‘push two carts’ is not quantized:

(70) Proof: It is possible for (x,e) and (x,e') , where e' is a proper subevent of e , to fall under ‘push two carts’, thus violating Quantization.

Note: The relationship between ‘push’ and its direct object does not satisfy Mapping to Subobjects. So the contradiction that arises in the above proof does not arise here.

- ‘push carts’ is cumulative, ‘push two carts’ is not:

(71) Proof: Assume (i) (x,e) falls under ‘push carts’: i.e. $\exists y$ [Carts(y) & PUSH(x,y,e)]
(ii) (x,e') falls under ‘push carts’: i.e. $\exists y'$ [Carts(y') & PUSH(x,y',e')

By cumulativity of Carts, it follows that Carts($y \oplus y'$)

By cumulativity of PUSH, it follows that PUSH($x, y \oplus y', e \oplus e'$)

Hence ‘push carts’ is cumulative.

Since ‘two carts’ is not cumulative, ‘push two carts’ also fails cumulativity.

(two events of ‘push two carts’ do not in general yield an event of ‘push two carts’.)

- Note: Failure of Cumulativity does not entail Telicity –
‘push two carts’ is not cumulative, but is still atelic.

shoot -past -1sg bear **-part**
'I shot at a bear.'/ 'I shot at the bear.'

b. Ammu -i -n karhu -n
shoot -past -1sg bear **-acc**
'I shot the bear.'/ 'I shot a bear.'

(74) a. Ammu -i -n karhu -j -a
shoot -past -1sg bear -pl **-part**
'I shot bears.'/ 'I shot at bears.'/ 'I shot at the bears.'

b. Ammu -i -n karhu -t
shoot -past -1sg bear **-pl.acc**
'I shot the bears.'

(75) a. Ammu -i -n kah-ta karhu -a
shoot -past -1sg two-part bear **-part**
'I shot at two bears.'/ 'I shot at the two bears.'

b. Ammu -i -n kaksi karhu -a
shoot -past -1sg two-acc bear **-part**
'I shot two bears.'/ 'I shot the two bears.'

▪ Kiparsky's basic proposal:

(76) a. A VP predicate is unbounded if it either has an unbounded head or an unbounded argument.

b. The object of an unbounded VP is obligatorily partitive.

▪ Applying the proposal:

(77) a. They touched (-B) the bombs (+B) for an hour/#in an hour.
→ partitive

b. They dropped (+B) the bombs (+B) in an hour/#for an hour.
→ accusative

c. They touched (-B) bombs (-B) for an hour/#in an hour.
→ partitive

d. They dropped (-B) bombs (-B) for an hour/#in an hour.
→ partitive

▪ The proposal advanced by Kiparsky correctly predicts the distribution of partitive case and the correlation between object case and interpretation.

▪ But it raises the following question, articulated in Kratzer (2004):

(78) Why should there be a connection between a semantic property of VPs and case morphology on direct objects?

2.7.2 THE TELICITY-CASE CONNECTION: A TELICITY/QUANTITY HEAD

- Kratzer (2004) and Borer (1998, 2005): a syntactic projection for telicity, which is also responsible for accusative case on objects.
- Kratzer notes that the correlation between object case and VP-interpretation also holds in the German conative alternation.

(79) a. Sie hat tagelang Fausthandschuhe gestrickt.
 she has for-days mittens-Acc knit
 ‘She knit mittens for days.’
 (there were mittens that she knit, some knitting mitten events culminated)

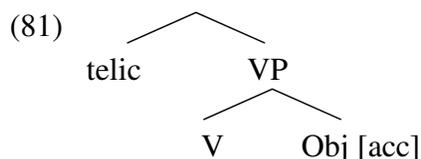
b. Sie hat tagelang an Fausthandschuhen gestrickt.
 she has for-days at mittens-Dat knit
 ‘She was knitting mittens for days.’
 (not necessary that any mittens were knit, no culmination required)

- Neither (79a) nor (79b) are atelic according to the algebraic definition. So at the very least the algebraic definition of telicity does not address the issue of culmination. Further, even though both (80a) and (80b) are atelic according to the algebraic definition, (80a) can combine with in-adverbials.

(80) a. Sie kann in weniger als drei Tagen wunderschöne Fausthandschuhe stricken.
 she can in less than 3 days wonderful mittens-Acc knit
 ‘She can knit wonderful mittens in less than three days.’

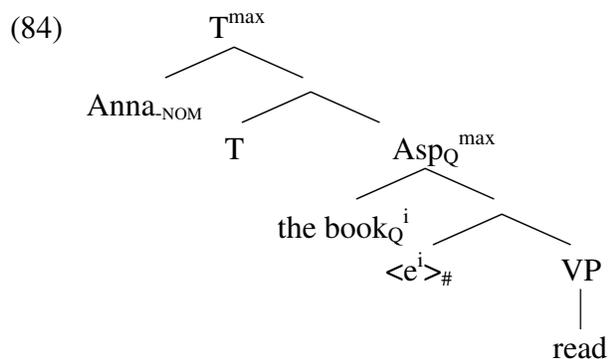
b. *Sie kann in weniger als drei Tagen an wunderschönen Fausthandschuhen stricken.
 she can in less than 3 days at wonderful mittens-Dat knit
 ‘*She can knit at wonderful mittens in less than three days.’

- Kratzer captures the case-interpretation correlation by assuming that the head that licenses accusative on objects has the semantics of a telicizing operator. The head that licenses partitive in Finnish lacks such semantics. A simplified version of her proposal is as follows:



- (82) a. shoot: $\lambda x, e$ [shoot-at(x,e)]
 b. climb: $\lambda x, e$ [climb-up(x,e)]
 c. [telic]: $\lambda R, x, e$ [$R(x,e) \ \& \ \exists f$ [measure(f) & $\forall x'$ [$x' \leq f(x) \rightarrow \exists e'$ [$e' \leq e \ \& \ R(x',e')$]]]]
 (f is a cognitively salient function that maps the referents of certain objects into ‘measuring rods’ – ways to measure out an event.)

- Three kinds of predicates
- (83) a. Predicates that are underlyingly atelic but which can behave variably as telic/atelic depending upon whether they combine with [telic] or not.
- b. Predicates that are underlyingly telic. These combine with [telic] for case-assignment reasons. Combination with other heads is blocked. Achievement verbs like ‘win’ and ‘lose’ are in this group.
- c. Predicates that are underlyingly atelic and which are unable to combine successfully with [telic], e.g. ‘love’, ‘admire’, ‘hate’, and ‘enjoy’. These verbs describe processes or states that do not directly affect their direct objects and therefore it is unclear how these direct objects could provide a bound for measuring the success of an event.
- Kratzer’s proposal separates some aspects of telicity from the lexical information but it still has a place for lexical information – e.g. the proposal that certain verbs are inherently telic and the proposal that certain verbs are inherently atelic in that they cannot legitimately combine with [telic].
 - A radical alternative is advanced by Borer (2005) who denies that lexical semantic properties have any direct role in determining aktionsart.
 - In Borer’s (2005) system, as in Kratzer’s, telicity is syntactically represented. There is an Asp_Q head associated with telic semantics. It needs to be licensed (i.e., assigned range in Borer’s terms), and the licensing can be done via a Spec-head relation with a + quantity DP (which is in turn assigned accusative case). Asp_Q can also be licensed by an appropriate head feature on V, merger of a functional morpheme in Asp_Q or an adverb of quantification.



- Borer’s reasons to avoid dependence on lexical information:

1. Krifka's treatment relies on the theta-roles assigned by the relevant predicate. But in certain cases, the argument that 'measures' out the event need not be in a theta-relationship with event-introducing predicate.
- (85) a. We sang the baby asleep
b. We ran our shoes threadbare.
2. What measures out the event seems to depend upon what is the direct object and not directly upon what the theme is. This makes direct reference to the theme suspect.
- (86) a. Kim sprayed the paint on the wall. (theme, location)
b. Kim sprayed the wall with the paint. (location, theme)
3. 'push the cart' vs. 'push the button': The distinction between the telic 'push the button' and the atelic 'push the cart' does not follow from the lexical contributions made by 'push', 'button', and 'cart' but rather by our assumptions about 'push the button' events. (Schein 2002, Borer 2005)
- (87) a. Kim pushed the cart/the button/the elevator.
b. Kim pulled the rope/the lever.
c. Johnny Reb heaved the cannon towards the Union battery (in/for 10 seconds). (from Schein 2002)
4. Cases where the endpoint/'target state' is not provided by the lexical semantics of the object, but rather by contextual assumptions.
- (88) a. Her face reddened.
b. We filled the room with smoke.
c. We cooked the eggs.
d. We wrote a sequence of numbers.
- In Borer's system, one might expect that any verbal root is free to combine or to not combine with Asp_Q. In Finnish this would lead us to expect that every predicate can have a partitive and an accusative object. But this is not the case.
 - Back to Finnish: three kinds of predicates
- (89) a. Predicates that allow both for partitive as well as for accusative objects. These are predicted by the system.
- b. Obligatory partitive predicates – these are always stative and for Borer, stative predicates do not involve an Asp_Q projection – hence no telicity and no accusative case.
 - c. Obligatory accusative predicates – these are all achievements, and do not directly fall out from the system. Borer proposes that these should be analyzed as a kind of idiom – a lexical root that requires an Asp_Q head. This does bring lexical subcategorization back into the system, but only for this class of predicates.

2.7.3 SYNTACTIC EVENT DECOMPOSITION

- The above approaches located telicity wrt a dedicated functional projection.
- Another prominent line of inquiry involves the decomposition of events into sub-events, e.g., an accomplishment event being represented as built up from an activity sub-event and an achievement/change of state sub-event. (Rothstein 2004, Ramchand 2003)
- Ramchand's (2003) proposal (see also Butt and Ramchand 2005)
 - A single, universal combinatorial system – syntax. No combinatorial operations in the lexicon
 - Lexical decomposition, of a sort. The information, traditionally thought to reside within single lexical items, is decomposed into a set of distinct categories, arranged in a particular hierarchy

2.7.3.1 *Semantic decomposition*

- Complex events are decomposed into sub-events, in a systematic and tightly constrained way. There are two types of sub-event relations/transitions – causation and event augmentation, which can be further reduced to a single relation “lead to”. There is a maximum of three potential sub-events for any macro-event (e): a source state (e₁), caused process (e₂), and caused result state (e₃) (cf. (90)).

(90) $e = e_1 \rightarrow \langle e_2, e_3 \rangle$

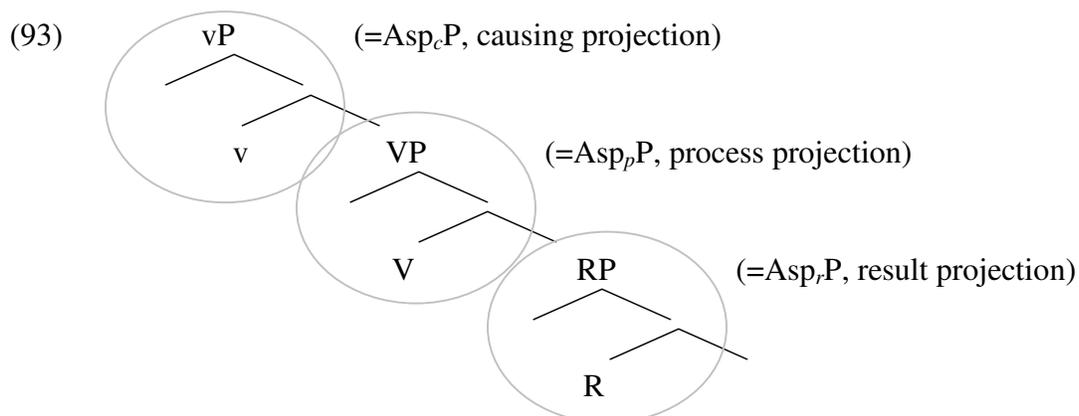
(91) ‘defuse a bomb’ (e): $e = \text{cause-defuse } (e_1) \ \& \ \text{process-defuse } (e_2) \ \& \ \text{result-defuse } (e_3)$

- The primitives of event-ontology are states and processes. Correspondingly, there are only two types of event predicates

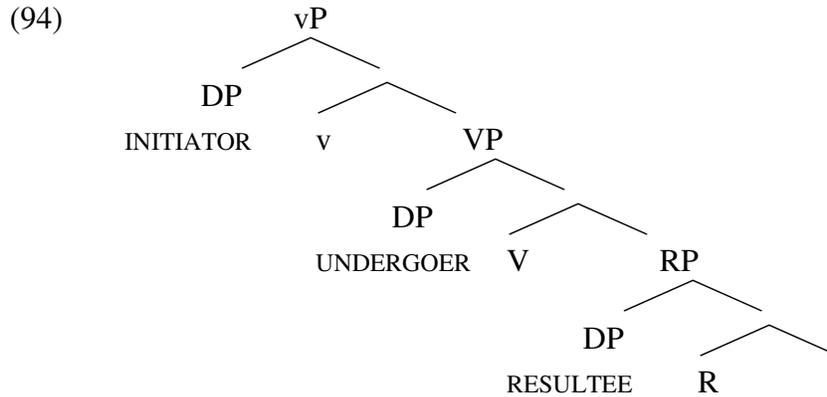
- (92) a. State(e): e is a state
 b. Process(e): e is a process or transition

2.7.3.2 *Syntactic decomposition*

- Three event projections build the syntactic structure underlying macro-events, as in (93). Articulated structure of what used to be the VP, now vP – the “first phase”.



- The proposal extends beyond the syntax of aktionsart, to include the claim that the syntactic projection of arguments is based on event structure (as also in Borer 2005)
- No theta-criterion. Thematic roles are reduced to three event-participant roles: INITIATOR, UNDERGOER, and RESULTEE



- (95)
- a. vP introduces the causation event, and licenses different types of external arguments – causer, initiator
 - b. VP specifies the nature of the change or process, and licenses the entity undergoing change or process. VP is present in every dynamic predicate (activity, accomplishment, achievement), it does not imply duration. It is not present in states.
 - c. RP gives the result state, and licenses the entity that comes to hold the result state. RP only exists when there is a result state explicitly expressed by the lexical predicate. Not all telic events have a result state.

2.7.3.3 *Interpreting the structures*

- A compositional semantics for aktionsart
- The aktionsart semantics is built in the absence of lexical information.

- (96)
- a. $[[R]] = \lambda P \lambda x \lambda e [P(e) \ \& \ \text{Result}(e) \ \& \ \text{Subject}(x,e)]$
 - b. $[[V_1]] = \lambda P \lambda x \lambda e \exists e_1, e_2 [P(e_2) \ \& \ V'(e_1) \ \& \ \text{Process}(e_1) \ \& \ e = \langle e_1, e_2 \rangle \ \& \ \text{Subject}(x, e_1)]$
 - c. $[[V_2]] = \lambda P \lambda x \lambda e [P(e) \ \& \ V'(e) \ \& \ \text{Process}(e) \ \& \ \text{Subject}(x,e)]$
 - d. $[[v]] = \lambda P \lambda x \lambda e \exists e_1, e_2 [P(e_2) \ \& \ v'(e_1) \ \& \ \text{Initiation}(e_1) \ \& \ e = e_1 \rightarrow e_2 \ \& \ \text{Subject}(x, e_1)]$

2.7.3.4 *The lexical entries*

- Verbs do not project the first phase syntax. They associate their encyclopedic content with the hierarchical structure created by the combination of the category features of v, V, and R.

- Lexical entries for verbs contain category information, and information about the number of arguments. I.e., the lexical items have a selectional requirement as to whether the specifiers are filled by distinct DPs or the same DP – we still have semantic selectional features in the lexicon.
- Coindexation indicates sharing a subject. Subjects of ResultP (RESULTEE) are also subjects of ProcessP (UNDERGOER), i.e. at most two direct arguments per predicate

- (97) a. defuse [v , V_i , R_i]
b. arrive, enter [v_i , V_i , R_i]
c. push, eat, build [v , V]
d. widen, rise, fall [V]
e. break [V_i , R_i]
f. \emptyset [v]

- Note that Ramchand groups together *push a cart* and *eat an apple* (contra Krifka, but with Borer and Kratzer)
- The issue is ‘optional’ telicity

- (98) a. John ate the/all/three/some apples (in an hour/*for an hour)
b. John ate apples (*in an hour/for an hour)

- Unlike Borer and Kratzer, for Ramchand the telicity of (98a) is derived not in the structure but by entailment, since the denotation of the UNDERGOER DP allows it. When the UNDERGOER DP is as in (98b), there is no entailment of telicity.
- Similar variable behavior of predicates like *defuse*, *arrive* is claimed to have a different source. Telicity is represented in the structure. The readings in (99b) and (100b) arise because of the contribution of an outside aspect, that contributes plurality.

- (99) a. John defused the/all/three/some bombs (in an hour/*for an hour)
b. John defused bombs (*in an hour/for an hour)

- (100) a. The/all/three/some men arrived (in an hour/*for an hour)
b. Men arrived (*in an hour/for an hour)

2.7.3.5 *Morphosyntactic realization*

- Entailed by the system is the possibility that multiple ‘pieces’ may spell-out the different parts of the event structure tree
- Light verbs in Hindi/Urdu are taken to spell-out v

(106) Maya is being stupid.

- In Hindi, the progressive, to the extent that it combines with states, coerces them into achievements.

(107) a. ??Maya uttar jaan rahii hai. (Hindi)
Maya answer know Prog.f be.Prs
'Maya is coming to know the answer.'
b. ??Maya lambii ho rahii hai.
Maya tall.f be Prog.f be.Prs
'Maya is becoming tall.'

- In contrast, imperfective morphology (that has habitual as (one of) its meaning) combines with statives, e.g., Slavic, Romance, Greek, Hindi.

(108) a. Maya uttar jaan-tii hai. (Hindi)
Maya answer know-Hab.f be.Prs
'Maya knows the answer.'
b. laRkiyaaN/??Maya lambii ho-tii hai.
Girls/Maya tall.f be-Hab.f be.Prs
'Girls are (usually) tall./#Maya is usually tall.'

- The interaction of progressive with states remains an outstanding problem.

3.2 PERFECTIVE + STATIVE

- In some languages, perfective morphology coerces states into achievements (inchoatives) (cf. Smith 1997)

(109) O Kostas *ayapise* tin Maria to 1991. (Greek)
The Kostas love-PAST.PERFECTIVE.3SG the Mary in 1991
'Kostas fell in love with Mary in 1991.'

(110) Maria *obik-n-a* Kosta (Bulgarian)
Maria love-PAST.PERFECTIVE.3SG Kosta
'Maria fell in love with Kosta.'

- For Slavic, perhaps there is an alternative explanation. If the perfective morphology (prefixes or the *-n* suffix¹) necessarily contributes telicity as well (or if these are just telicity markers,

¹ Note that in the Bulgarian examples the suffix *-n* is used, rather than a prefix. Thus the inchoative element cannot be attributed to the addition of lexical information.

cf. Filip 2000), the change of aktionsart is explained. Telicity by its very nature gives us a change of state. It still remains to be explained why we get a change-into-state rather than a change-out-of-state. The answer, we believe, is related to the fact that telicity involves reaching a target state (e.g., accomplishments and achievements).

- Indeed, in Bulgarian, the same facts obtain with activities as well.

(111) Ivan *pis-n-a* (Bulgarian)
Ivan scream_{-PAST.PERFECTIVE.3SG}
'Ivan started screaming.'

- Such an explanation is not available for Greek, where perfective morphology is compatible with activities without coercing them into achievements.
- Nor is such an explanation available for Chinese. Chinese *-le* is not associated with telicity.
- Chinese *-le* is traditionally considered a perfective marker, but it does not contribute culmination (Smith 1997:68-69). What seems likely is that the underlying event in (112a) is simply not telic (supporting a view such as that of Kratzer, Borer, Ramchand), and that *-wan*, like Slavic prefixes or Germanic particles, builds telic events. Once perfective *-le* applies to a telic event (cf. (112b)), it asserts culmination.

(112) a. Wo zuotian *xie-le* yifeng xin, keshi mei *xie-wan* (Chinese)
I yesterday write-LE oneCL letter but not write-finish
'I wrote a letter yesterday, but didn't finish it.'

b. # Wo zuotian *xie-wan-le* yifeng xin, keshi mei *xie-wan*
I yesterday write-WAN-LE oneCL letter but not write-finish
'I wrote a letter yesterday, but didn't finish it.'

- Despite the fact that Chinese *-le* is not obligatorily associated with telicity, when it combines with states, it turns the states into achievements.

(113) Mali *bing-le* (Chinese)
Mali sick-LE
'Mali got sick'

- Similar facts obtain in Hindi.
- The interaction of perfective with states remains an outstanding problem.

References

(We only reference work cited in this handout. There is a vast literature on aspect, and a comprehensive bibliography can be found at:

<http://www.scar.utoronto.ca/~binnick/TENSE/Index.html>)

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