

Aspect and temporal definiteness

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Introduction & inner aspect

Practical information

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- Slides will be made available at <https://www.eggsschool.org/>

Course plan

- Introduction: Inner aspect, aspectual composition
- Introduction: Outer aspect (vs. Tense)
- Introduction: “Slavic”-style aspect (point of departure: Russian)
- Cross-Slavic variation in aspect use
Theoretical accounts of this variation in terms of temporal definiteness
- General exploration: Transfer of ideas from theories on definiteness in the nominal domain to events and times

What is “aspect”?

- Standard description:
Aspect deals with **the internal temporal constituency of an event.**

Two-component approach to aspect:

- **Inner aspect**
 - *aka* lexical / predicational / situation aspect, Aktionsart (“Western” terminology)
 - (a)telic, (non-)resultative, (non-)change-of-state, (non-)atomic ... (non-)durative ... static/dynamic ...
 - **Predicates or verbs?**
- **Outer aspect**
 - *aka* grammatical / morphological / viewpoint aspect
 - (Im)perfective (e.g. Slavic), (Non-)Progressive (e.g. English, Spanish), Aorist vs. Imperfect (e.g. Bulgarian, French, Spanish), (Perfect) ...

NB: Perfective ≠ Perfect (Imperfective ≠ Imperfect)

Aspect in this course

- Inner aspect
 - Classification of event types into simple (mono-eventive) and complex (bi-eventive) ones; sub-classifications of these (~ Vendler classes)
 - ~ (a)telic event types at the level of VP (ν P) (~ verb + argument(s))
- Outer aspect
 - Operates on event types, adds temporality to atemporal event structures
 - Relation between event (situation) time and reference (topic) time

vs. Tense: Relation between reference/topic time and speech/utterance time

- Syntactic background assumption, e.g. (1):

(1) [T(ense)P [Mod(al)P [Asp(ect)P [VP]]]]

(e.g. Demirdache & Uribe-Etxebarria 2014)

- VP: Inner Aspect
- AspP: Outer Aspect

Inner aspect

Vendler (1957)

Aspectual classes: “the particular way in which [a] verb [in its dominant use] presupposes and involves the notion of time”

- States, activities, accomplishments, achievements

- Durative vs. non-durative: ACT/ACC vs. STA/ACH

- Set terminal point vs. no set terminal point [~ telic vs. atelic]:
ACC/ACH vs. STA/ACT

- Standard assumption nowadays:

- Classification of predicates (VPs), not of verbs

- It might be debatable whether this is really about “time”.

Vendler (1957): States

e.g. *have/possess/desire/want sth., (dis)like/love/hate/rule/dominate sb./sth., know/believe things, be married/present/absent/healthy/ill*

- no process going on in time
- non-unique, indefinite time instants
- incompatible with *deliberately, carefully* [→ no intentionality]
- qualities
- I can say 'I have seen it' as soon as I can say 'I see it'.

Vendler (1957): Activities

e.g. *run, walk, swim, push, pull*

- **process** going on in time / successive phases following one another in time
- **non-unique, indefinite time periods**
- **no “set terminal point”** [→ **atelic**]
- **homogeneous**: any part of the process is of the same nature as the whole

Vendler (1957): Accomplishments

e.g. *paint a picture, make a chair, build a house, write/read a novel, deliver a sermon, give/attend a class, play a game of chess, grow up, recover from illness, get ready for sth.*

- **process** going on in time / successive phases following one another in time
- **unique, definite time periods**
- “**set terminal point**” [→ **telic**]
- **not homogeneous**: proceed towards a terminus which is logically necessary to their being what they are

Vendler (1957): Achievements

e.g. *recognise/realise/spot/identify sth., lose/find an object, reach the summit, win the race, cross the border, start/stop/resume sth., be born, die*

- no process going on in time
- unique, definite time instants
- can be predicated only for single moments of time
- Present tense is almost exclusively used as historic present or as indicating immediate future.
- can be voluntary (*start/stop running*) or involuntary (*recognising*)

Vendler (1957)

- (In)compatibility with the Progressive

(2) - What are you doing?

- | | | |
|----|---|-----|
| a. | - I am running / writing / working. | ACT |
| | - I am writing a letter / painting a picture. | ACC |
| b. | - #I am recognising. | ACH |
| | - #I am loving my brother. | STA |

→ PROG is only compatible with “processes going on in time”

Vendler (1957)

- ACT vs. ACC: (no) “set terminal point” [(a)telic]

- (3) a. If someone stops running, he ran. ACT
 #He finished running / pushing a cart.
- b. If someone stops running a mile, he did not run a mile. ACC
 He finished running a mile / drawing a circle.
- (4) a. For how long did he push the cart? ACT
 #How long did it take to push the cart?
- b. #For how long did he draw the circle? ACC
 How long did it take to draw the circle?
 He did it in twenty seconds.
 It took him twenty seconds.
- (5) If it is true that someone has been running for half an hour, then it must be true that he has been running for every period within that half-hour. ACT

Vendler (1957)

- ACH vs. STA

- | | | | |
|-----|----|---|-----|
| (6) | a. | At what time did you reach the top?
At what moment did you spot the plane? | ACH |
| | b. | For how long did you love her?
How long did you believe in the stork? | STA |

- ACC vs. ACH

- | | | | |
|-----|----|---|-----|
| (7) | a. | It took me an hour to write a letter. | ACC |
| | b. | It took him three hours to reach the summit.
(not the reaching of the summit, but climbing went on during those hours) | ACH |
| | c. | He found it in five minutes.
(not the finding, but searching went on during those 5 minutes) | ACH |

Vendler (1957)

- **Habits:** Occupations, dispositions, abilities etc.
 - Derived states (generic states)
 - (in opposition to “specific” states, i.e. STA)

- (8)
- a. He smokes.
 - b. He writes books / articles.
 - c. He catches dogs.

[English simple present tense with non-states describes habits]

Vendler (1957): Different uses of verbs

- *think*
 - ACT: He is thinking about Jones.
 - STA: He thinks that Jones is a rascal.

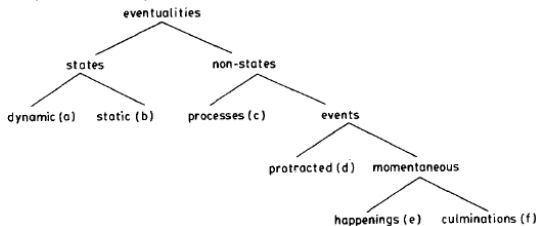
- *know, understand*
 - STA: know sth. / how / that cp. *be married*
 - ACH: Suddenly I knew! Now I know it! cp. *get married*
 [inchoative reinterpretation, conditioned by 'suddenly']

- perception verbs *see, hear*
 - STA: *I am seeing. / I saw him running.
 - ACH: spotting sense: I spotted him running. [inchoative]
 - ACC: I am seeing *Carmen* on TV.

Other classifications

- Discourse: **states** (temporal overlap) vs. **events** (temporal progression, R-time movement) (e.g. Kamp & Reyle 1993; Lascarides & Asher 1993)
(NB: One-component theories)
- **states, processes** [\sim ACT] , **events** [\sim ACC & ACH] (e.g. Bach 1981, 1986; Verkuyl 1993; de Swart 1998)
 - Motivation: Difference between ACC and ACH is linguistically not (Verkuyl) / less (Bach, de Swart) relevant (but see, e.g., Rothstein 2004)

Bach (1981, 1986):



Additional classes

- **Semelfactives:** *sneeze, knock, jump*

(Smith 1991/97) (but see Rothstein 2004)

- e.g. English: ambiguous between one-time (atomic, but no change of state) and iterative reading
- Cross-linguistically not clear which one is basic; e.g. Russian: semelfactive is morphologically more complex (suffix *-nu-*) (9)

- (9) a. IPFV *stučat* 'knock (iteratively)'
 b. PFV *stuk-nu-t* 'knock (once)'

- **Degree achievements:** *rise, fall, cool, lengthen, straighten*

(Dowty 1979) (see also Krifka 1998; Hay et al. 1999; Kennedy & Levin 2008, i.a.)

- Gradual, relative change of state
- Variable behaviour wrt telicity tests

Some standard telicity tests

- (In)compatibility with *for/in*-adverbials

(10) Atelic predicates

- | | | |
|----|--|-----|
| a. | She pushed the cart {for/#in} two hours. | ACT |
| b. | She ruled the country {for/#in} two years. | STA |

(11) Telic predicates

- | | | |
|----|--|-----|
| a. | She drew the circle {#for/in} two hours. | ACC |
| b. | She recognised her mistake {#for/in} one second. | ACH |

NB: ACH + *in*-adv (e.g. (11-b)) is sometimes taken to involve (additive) coercion (reinterpretation), adding a preparatory process (e.g. Moens & Steedman 1987; Rothstein 2004; Bott 2013)

Some standard telicity tests

- Imperfective Paradox (Dowty 1979)

- (12) a. She was running. → She ran. ACT
- b. She was crossing the road. ↗ She crossed the road. ACC
- She was reaching the summit. ↗ She reached the summit. ACH
- (not applicable to states, since they are incompatible with PROG)

- *Finish* requires a telic predicate as a complement (see above).
- (Lack of) ambiguity with *again, almost* (see below)
- ...

Potential problems with the in/for-adv test

- Coercion / reinterpretation

- (13)
- In ten minutes, she knew the answer.
 - She ran in 2 hours.
 - She discovered fleas on her dog for two hours.
 - For 20 years she read a chapter before going to bed.

- **Inchoative**: adds a temporal onset to a state or an activity (13-a,b)
- **Delimitative**: Temporal boundedness of an atelic event (needs stronger context) (13-b)
- **Iterative**: with telic predicates (13-c,d)

(Different scope of temporal adverbs)

Moens & Steedman (1987)

- Event nucleus:

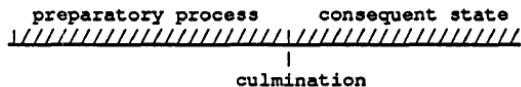


Figure 3

- Aspectual classes:

	EVENTS		STATES
	atomic	extended	
+conseq	Harry left early At six, John arrived	Sue built a sandcastle The ice melted completely	John knows French He was in the kitchen
-conseq	Sandra hiccupped Paul winked	Max worked in the garden Alice played the piano	

Figure 1

Moens & Steedman (1987)

- Coercion routes:

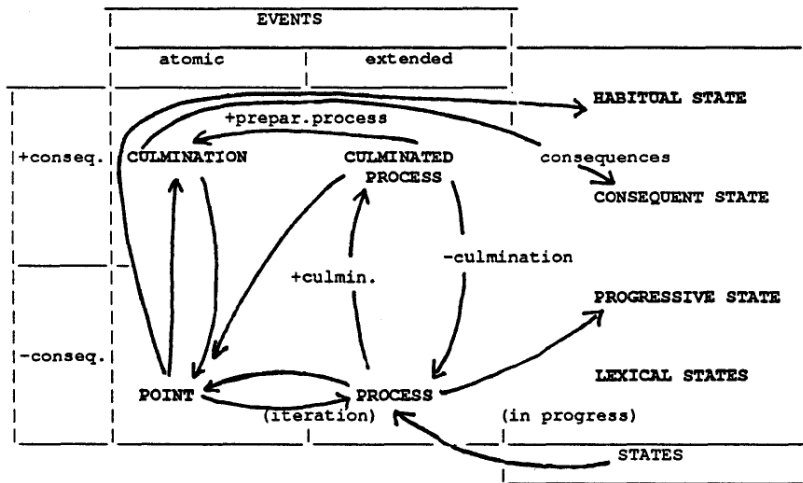


Figure 2

Potential problems with the in/for-adv test

- Additional sensitivity to outer aspect

- e.g. PROG on telic predicates: behaviour like atelic predicates (14)

(14) She was eating the cake for ten minutes/#in ten minutes.

- In languages without morphological outer aspect, simple tenses can receive both progressive and non-progressive interpretations so that both adverbials can be ok; e.g. German (15)

(15) Sie aß den Kuchen zehn Minuten lang/in zehn Minuten.
she ate the cake ten minutes long/in ten minutes

- General issues raised by such facts:

- Is this a test for outer, rather than for inner aspect?
- Doesn't this show that we should not make a distinction between inner and outer aspect? (e.g. common analysis of PROG as “stativiser”)

- (Issues of markedness)

How to capture the property of (a)telicity

- Vendler:
 - ACTs are **homogeneous**: “running and its kind go on in time in a homogeneous way; any part of the process is of the same nature as the whole”
 - ACCs are not homogeneous: “proceed towards a terminus which is logically necessary to their being what they are”
- Bennett & Partee (1972): **Subinterval property**
 - Non-subinterval VPs, e.g. *walk to Rome*: “If it took an hour to walk to Rome, one did not walk to Rome within the first thirty minutes of the hour”
 - Subinterval VPs, e.g. *walk*: “if they are the main verb phrase of a sentence which is true at some interval of time I , then the sentence is true at every subinterval of I including every moment of time in I ”

Reformulated in terms of events; e.g. Champollion (2010):

$$(16) \quad \forall e[[\text{walk}]](e) \rightarrow \forall i[i < \text{runtime}(e) \rightarrow \exists e'[[\text{walk}]](e') \wedge e' < e \wedge i = \text{runtime}(e')]]]$$

Potential problems of the subinterval property

- The first moments of a *walk*-event are not describable by *walk* (see also discussion in Dowty 1979)
 - Subinterval property only for states (e.g. Maienborn 2007)
 - It is a matter of granularity (most other people)

- Bennett & Partee's initial use in the definition of PROG:

(17) [PROG ϕ] is true at interval I iff there exists an interval I' such that $I \subset I'$, I is not a final subinterval of I' , and ϕ is true at I' .

- Generates the imperfective paradox (cf. Dowty 1979)
(common solution: modalisation; we will get back to this when we talk about outer aspect)

Parallels between events and objects

- Taylor (1977):
 - ACTs like *fall*, *blush*: like homogeneous mass nouns (e.g. *gold*)
 - divisible
 - ACTs like *walk*: like heterogeneous mass nouns (e.g. *fruitcake*)
 - divisible up to minimal proper parts (pragm. determined size)
 - [Telic predicates]: like sortal/count nouns (e.g. *cat*)
 - indivisible
 - (in mereology: *antisubdivisible*, Bach 1986 / *quantized*, Krifka 1986)

- Mourelatos (1978): (Non-)countability (18)
 - (18)
 - a. fall asleep three times
 - b. Vesuvius erupted three times
 - There were three eruptions of Vesuvius

 - (19)
 - a. run (*)three times
 - b. Onlookers shoved and screamed
 - There was shoving and screaming

Parallels between events and objects

- Bach (1981, 1986):

- (20) a. **much** wine / he did not sleep **much**
 b. **many/three** books / he arrived **many/three times**

- (21) **Universal Grinder** (Pelletier 1975): count→non-count (predictable)

- a. Much missionary was eaten at the festival.
 b. John ate the sandwich bit by bit for an hour, but still didn't finish it.

- (22) **Universal Packager**: non-count→count (not predictable)

- a. After two beers he began to feel better. → portion
 He prefers Tuscan wines. → kind
 b. John ran in an hour. → *began to* OR *a certain distance*

(“universal sorter” in Bunt 1981)

Parallels between events and objects

- Bach (1981, 1986): mereological approach (similar to Krifka; see below)
 - Mereology (Link 1983; Sharvy 1980): Part-of relation \leq , sum \oplus / \sqcup
 - Mass nouns, processes: Non-atomic join semilattice → additive
 - Count nouns, events: Atomic join semilattice, (23), → antidisubdivisible

(23) (from Nouwen 2016)

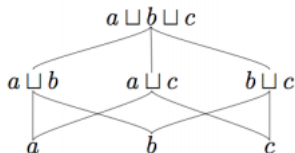


Figure 1.1 A depiction of the complete atomic join semi-lattice with a , b and c as the atomic elements. The arcs represent the \leq relation.

Aspectual composition

Theoretical approaches to (a)telicity

- **Scale structure approaches**

e.g. Krifka (1989a, 1992, 1998); Hay et al. (1999); Kennedy & Levin (2008); Kennedy (2012); Caudal & Nicolas (2005); Piñón (2008); Beavers (2008) (Verkuyl 1972, 1993, 2005)

- **Event structure approaches**

e.g. von Stechow (1996); Rappaport Hovav & Levin (1998); Levin & Rappaport Hovav (2006); Rappaport Hovav & Levin (2010); Rothstein (2004); Beck (2005) (without events: Dowty 1979)

- **Syntactic approaches**

e.g. Pustejovsky (1991); Travis (2000); Borer (2005); Arsenijević (2006); Ramchand (2008) (Verkuyl 1972, 1993, 2005)

The scale structure approach in a nutshell

- A complement of the verb, e.g. the internal argument, provides (part of) a **scale** (a linearly ordered structure).
- Properties of the scale determine whether the event is:
 - **telic**: with a closed scale or a scale with an upper bound) (24-a); or
 - **atelic**: with an open scale or a scale with no upper bound (24-b), or no scale (24-c)

- (24)
- a. She ate **the apple** (*for/in an hour).
 - b. She ate **apples** (for/*in an hour).
 - c. She ate (for/*in an hour).

→ This approach draws direct parallels to the literature on scale structures underlying adjectives (literature on degrees).

Event-object homomorphism

- Properties of (some) internal arguments influence the interpretation of the event as (a)telic (25) (but not (26)):
 - Gradual/successive patient (Krifka 1986, 1989a, 1992)
 - **Incremental themes** (Dowty 1991)

(25) a. She ate (apples) for/#in two hours.
 b. She ate an/the apple / three apples in/#for two hours.

(26) a. He hit a/the dog / (three) dogs for/#in two hours.
 b. He pushed a/the cart / (three) carts for/#in two hours.

→ Extent of the object delimits the (temporal) extent of the event

(Krifka 1986, 1989a, 1992)

- Two properties (for both objects and events):

(27) **Cumulative:**

$$CM(P) \leftrightarrow \forall x, y [P(x) \wedge P(y) \rightarrow P(x \oplus y)] \wedge \exists x, y [P(x) \wedge P(y) \wedge \neg x = y]$$

e.g. *soup, apples // eat (soup/apples)*

(28) **Quantized:** $QUA(P) \leftrightarrow \forall x, y [P(x) \wedge P(y) \rightarrow \neg x < y]$

e.g. *{an/two/a bowl of} apple(s) // eat {an/two/a bowl of} apple(s) / eat for two hours*

- Mapping from (sub)objects to (sub)events (Germ., Engl. etc. / Finn. partitive)
- Mapping from (sub)events to (sub)objects (Czech, Chin. etc.)
- Uniqueness of events/objects; measure functions ...

Krifka (1998): Extension to **incremental paths, property scales** (see below)

(Krifka 1989b)

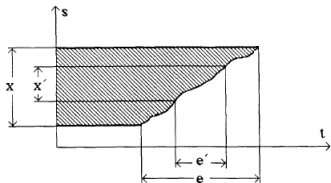


Abbildung 5: Übertragung der Referenzweise

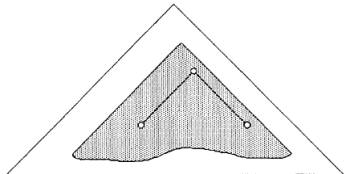


Abbildung 3a: Kumulative Extension

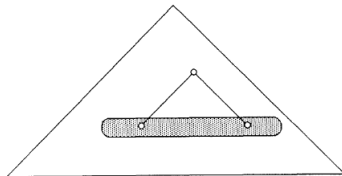


Abbildung 3b: Gequantelte Extension

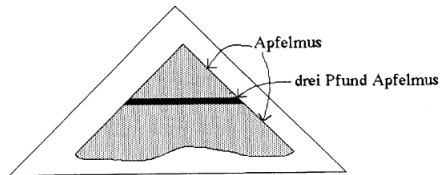


Abbildung 4: Gequantelte Teilextension

Krifka (1989a): Different thematic roles

- Depending on which properties hold:
 - SUM: summativity of the object relation → cumulativity of the object gets mapped onto the event
 - GRAD: graduality [incrementality] → quantizedness of the object gets mapped onto the event
 - UNI-E: unique event

	SUM	GRAD	UNI-E	
write a letter	X	X	X	gradual effected patient
eat an apple	X	X	X	gradual consumed patient
read a letter	X	X	–	gradual patient
touch a cat	X	–	–	affected patient
see a horse	X	–	–	stimulus

(Krifka 1989b): Mapping from (sub)events to (sub)objects

Czech:

- (29) a. Ota pil vino.
 Ota.NOM drank.IPFV wine.ACC
 'Ota drank **wine**.'
- b. Ota vypil vino.
 Ota.NOM drank.PFV wine.ACC
 'Ota drank **the wine**.'

[NB: oversimplified view]

Generalised “measuring out” in Krifka (1998)

(see also Jackendoff 1996; Ramchand 1997) (“measuring out”: Tenny 1987, 1994)

- Homomorphism between the event and a scale

- Incremental verbs: Extent/volume of an object

(see also Kennedy 2012, i.a.)

- Directed motion events: Spatial path (30-a)

(see also Zwarts 2005, 2006; Winter 2006; Gehrke 2008, i.a.)

- (30)
- He pushed the cart to the store in two hours.
 - He pushed the cart {down the river / towards the store / to stores} for two hours.

- Degree achievements: Scalar adjectival property (31-b)

(see also Hay et al. 1999; Kennedy & Levin 2008; Kearns 2007, i.a.)

- (31)
- The sky darkened in(/for) an hour.
 - The gap widened (in/)for ten minutes.
 - The soup cooled (by) 17 degrees {in/#for} 30 minutes.

E.g. degree achievements

Hay et al. (1999); Kennedy & Levin (2008):

- With **deadjectival degree achievements**, the telos is the standard associated with the underlying adjective.
 - Those derived from **closed-scale adjectives**: telic
 - Those derived from **open-scale adjectives**, which have a context-dependent standard somewhere on the scale: telic or atelic (32)

(32) The soup cooled {for/in} an hour.

- (33)
- a. The tailor almost lengthened the pants.
 - b. The teacher almost lengthened the exam.

(examples from Hay et al. 1999)

Degree achievements

(Hay et al. 1999; Kennedy & Levin 2008)

- (34)
- a. The tailor almost lengthened the pants.
 - b. The teacher almost lengthened the exam.

- Depending on the standard degree on the underlying scale in the context, such degree achievements can be atelic or telic.
 - Telic (34-a): Pants usually come with some standard bounded length.
 - Atelic (34-b): Exams can be of any random length.

(A)telicity diagnostics with *almost*:

- Ambiguity in the telic example a.: (i) the entire eventuality almost took place, *or* (ii) the pants almost became long
- No ambiguity in the atelic example b.: only reading (i)

Aspectual classes and scale structure

- Levin & Rappaport Hovav (2006); Rappaport Hovav & Levin (2010):
 - **Result verbs** lexicalise a change of state along a uni-dimensional scale. [\sim ACC/ACH]
 - **Manner verbs** do not lexicalise such a uni-dimensional scale, but refer to change in various dimensions. [\sim ACT]

- Beavers (2008):
 - **Two-point scales** [\sim ACH]
 - **Scales with more intervals** [\sim ACC]

Event structure approaches

Dowty's (1979) proposal to decompose predicates, reformulated in event semantic terms

- An event (the **macroevent**) can be structurally complex and decomposable into **subevents**.
- Subevents are associated with CAUSE, DO or BECOME, or related notions such as preparatory phase, initiating state, process, transition, culmination, consequent or result state and the like.

Dowty (1979)

- **States** (35) (e.g. *John knows the answer.*)

$$(35) \quad \pi_n(\alpha_1, \dots, \alpha_n).$$

- **Activities** (36) (e.g. *John is walking.*)

$$(36) \quad \text{DO}(\alpha_1, [\pi_n(\alpha_1, \dots, \alpha_n)]).$$

- **Achievements** (37) (z.B. *John discovered the solution.*)

$$(37) \quad \text{BECOME}[\pi_n(\alpha_1, \dots, \alpha_n)].$$

- **Accomplishments** (38) (e.g. *John broke the window.*)

$$(38) \quad \text{DO}(\alpha_1, [\pi_n(\alpha_1, \dots, \alpha_n)]) \text{CAUSE}[\text{BECOME } \rho_m(\beta_1, \dots, \beta_n)]].$$

Dowty (1979) on DO, CAUSE, BECOME

(39) $\Box[\text{DO}(\alpha, \phi) \leftrightarrow \phi \wedge \phi$ is under the immediate control of the agent (an individual denoted by α)]. (Dowty 1979, 118)

(40) $[\text{BECOME } \phi]$ is true at I iff there is an interval J containing the initial bound of I such that $\neg\phi$ is true at J and there is an interval K containing the final bound of I such that ϕ is true at K .

(Dowty 1979, 140)

- (41) a. $[\phi$ **cause** $\psi]$ is true iff
- (i) ϕ is a causal factor for ψ , and
 - (ii) for all other ϕ' such that ϕ' is also a causal factor for ψ , some $\neg\phi$ -world is as similar or more similar to the actual world than any $\neg\phi'$ -world is.
- b. ϕ **depends causally on** ψ iff ϕ , ψ and $\neg\phi \Box\rightarrow \neg\psi$ are all true.
- c. ϕ is a **causal factor** for ψ iff there is a series of sentences $\phi, \phi_1, \dots, \phi_n, \psi$ (for $n \geq 0$) such that each member of the series depends causally on the previous member.

(after Lewis 1973)

Dowty (1979) on accomplishments

- Lexical (42) vs. syntactic ACCs, e.g. resultatives (43)

(42) John kills Bill.

[[*John does something*] CAUSE [BECOME \neg [*Bill is alive*]]]

(43) He sweeps the floor clean.

[[*He sweeps the floor*] CAUSE [BECOME [*the floor is clean*]]]

- More examples for syntactic ACCs:

- Motion verbs + [some] PPs [in some languages] (44-a)
- *put*-verbs + PP-complements (44-b)
- More resultatives (Dowty: *factitive (adjective of result)*) (44-c); (44-d)
- Particle verbs in English [and other languages] (44-e)

- (44)
- walk, swim, fly to NP; drive, carry, push NP to NP
 - put, place, set NP in(to) NP; put NP to sleep
 - hammer NP flat, wipe NP clean, wiggle NP loose
 - drive NP to drink, read oneself to sleep, drink NP under the table
 - take NP out, chase NP away; sit down, dry out

Dowty (1979): telicity

- Defined in terms of the **subinterval property** (Bennett & Partee 1972)
 - (Atelic) states (45), ACTs (46): true at subintervals
 - (Telic) ACCs, ACHs: not true at subintervals (47)

(45) If α is a **stative predicate**, then $\alpha(x)$ is true at an interval I just in case $\alpha(x)$ is true at all moments within I .

(46) If α is an **activity** verb, then if $\alpha(x)$ is true at I , then $\alpha(x)$ is true for all subintervals of I which are larger than a moment.

(47) If α is an **accomplishment/achievement** verb, then if $\alpha(x)$ is true at I , then $\alpha(x)$ is false at all subintervals of I .

Parsons (1990)

- Problem with Dowty's (1979) treatment of DO, CAUSE, BECOME as sentence operators:
 - There is no evidence that the cases under discussion are bisentential: no scope ambiguities, always direct causation
→ Instead: bieventive
- Causatives:

- (48) a. Mary flew the kite.
 b. $(\exists e)[\text{Agent}(e, \text{Mary}) \ \& \ \text{Cul}(e) \ \& \ (\exists e')[\text{Flying}(e') \ \& \ \text{Cul}(e') \ \& \ \text{Theme}(e', \text{Kite}) \ \& \ \text{CAUSE}(e, e')]]$.

(48) entails (49)

- (49) a. The kite flies.
 b. $(\exists e')[\text{Flying}(e') \ \& \ \text{Cul}(e') \ \& \ \text{Theme}(e', \text{Kite})]$.

Parsons (1990) on inchoatives

- BECOME relates an event and its target state - two postulates:
 - $\text{BECOME}(e, s) \rightarrow [\text{Theme}(e, x) = \text{Theme}(s, x)]$.
 - $\text{BECOME}(e, s) \ \&\text{Cul}(e, t) \rightarrow \text{Hold}(s, t) \ \&\ \neg(\exists t')[t' < t \ \&\text{Hold}(s, t')]$.

- (50)
- x closes the door tight.
 - $(\exists e)[\text{Cul}(e) \ \&\text{Agent}(e, x) \ \&\ (\exists e')[\text{Cul}(e') \ \&\ \text{Theme}(e', \text{door}) \ \&\ \text{CAUSE}(e, e') \ \&\ (\exists s)[\text{Being-closed}(s) \ \&\ \text{Theme}(s, \text{door}) \ \&\ \text{Hold}(s) \ \&\ \text{BECOME}(e', s) \ \&\ \text{Being-Tight}(s)]]]]$.

Rothstein (2004)

- Verbs denote sets of events of a particular event type
- Event types: lexical aspectual classes
 - Classes as constraints on how events can be individuated
 - E.g. the event structure of a given verbal predicate can be augmented, e.g. by secondary resultative predication

(51) STA: $\lambda e.P(e)$

(52) ACT: $\lambda e.(DO(P))(e)$

(53) ACH: $\lambda e.(BECOME(P))(e)$

(54) ACC:

$$\lambda y \lambda e. \exists e_1, e_2 [e =^S (e_1 \sqcup e_2)$$

$$\wedge \text{ACTIVITY}_{\langle x \rangle} (e_1) \wedge \text{Ag}(e_1) = x \wedge \text{Th}(e_1) = y$$

$$\wedge \text{BECOME}_{\langle y \rangle} (e_2) \wedge \text{Arg}(e_2) = \text{Th}(e_1)$$

$$\wedge \text{INCR}(e_1, e_2, C(e_2))]$$

Rothstein (2004)

(55) Let e be a BECOME event.

An **incremental chain** $C(e)$ is a set of parts of e such that:

1. the smallest event in $C(e)$ is the initial bound of e
2. for every e_1, e_2 in $C(e)$ $e_1 \sqsubseteq e_2$ or $e_2 \sqsubseteq e_1$
3. $e \in C(e)$

(56) **Incremental relations**

Let e_1 be an activity, e_2 be a BECOME event, and $C(e_2)$ be an incremental chain defined on e_2 .

$\text{INCR}(e_1, e_2, C(e_2))$ (e_1 is incrementally related to e_2 with respect to the chain $C(e_2)$) iff:

there is a contextually available one-one function μ from $C(e_2)$ onto $\text{PART}(e_1)$ (the set of parts of e_1) such that:
for every $e \in C(e_2)$: $\tau(e) = \tau(\mu(e))$.

Rothstein (2004): Telicity

- Atelic predicates are S-cumulative:

(57) X is **S-cumulative** iff:

$$\exists e \exists e' [X(e) \wedge X(e') \wedge \neg e \sqsubseteq e' \wedge \forall e \forall e' [X(e) \wedge X(e') \wedge R(e, e') \rightarrow X^S(e \sqcup e')]]$$

(X is S-cumulative if it is not a singleton predicate, and if for any two elements x and y in X which stand in the appropriate relation, the singular element which is formed out of the sum of x and y is also in X.)

- (58) **The telicity principle:** A VP is telic if it denotes a set of events X which is atomic, or which is a pluralisation of an atomic set (i.e. if the criterion for individuating an atomic event in X are fully recoverable).

Rothstein (2004)

- ACCs & ACHs: definite changes
 - An event of change from $\neg\phi$ to ϕ is a minimal event of change (ACHs)
 - ACC: extended event of change from ψ to ϕ , whereby ψ implies $\neg\phi$
 - This change takes place during an interval that is long enough to get from ψ to ϕ and that is kept together by an incremental chain.
- Such events are telic if no other factors interfere (e.g. mass nouns, bare plurals)
- Only when it is already lexically specified that the verb is made up of atomic segments, properties of the internal argument can affect telicity.

Syntactic decomposition of event predicates

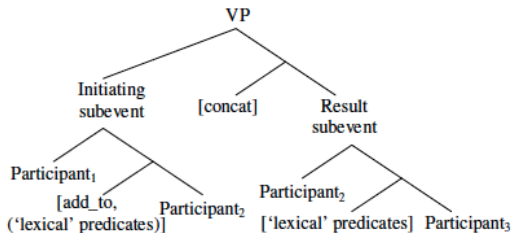
- Commonly in terms of VP shells, each shell introducing a subevent that is semantically related in some way to the other subevent
 - States, activities: one VP
 - Accomplishments, achievements (changes of states): at least two VPs
- e.g. Ramchand (2008):
 - init(iator)P , proc(ess)P , res(ult)P
 - Arguments in Spec's: initiator, undergoer, resultee
 - Projections related by a semantically defined “leads-to”-relation

Arguments in Arsenijević (2006) that you need at most two projections:

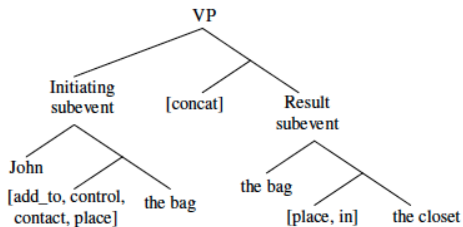
- Undergoer and resultee are never distinct
- All you need to model is the change of state (prestate vs. poststate)

Arsenijević (2006)

(3) The telic template



(4) An example for the template: 'John put the bag into the closet.'



(from Arsenijević 2006, 238f.)

Summary

- What we have done so far:

- Inner vs. outer aspect

Inner aspect:

- Vendler classes (sta, act, acc, ach) and other classes
- (A)telicity
- Aspectual composition
 - Scale structure and event structure
 - Event decomposition in syntax and semantics

- Where we are heading next: Outer aspect

- Aspect and Tense as relations between times (Reichenbach, Klein)
- The Progressive and imperfectivity more generally
- Aspect in Russian

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