Toward a topological theory of the aspectual conceptualization of events

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“Lexical” aspect for thought

Aspect

“[D]ifferent ways of viewing the internal temporal constituency of a situation.” (Comrie 1976)

1. Blanca climbed towards the top for five minutes. (atelic, Activity)
2. Blanca climbed to the top in five minutes. (telic, Accomplishment)

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The construal view of aspect (Croft 2012)

When expressed into words, the representation of an experience is accompanied by a construal (aspectual type) for how the event unfolds over time.

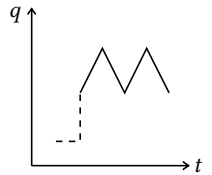
- Construals could be prelinguistic objects: language could be a window into thought.
- Croft (2012): What are these construals? How do they alternate with one another?
  - Example: *Wilfrid coughed at noon* vs. *Wilfrid coughed for two minutes*
- Following that work, I only describe construals for entire sentences, staying agnostic as to whether and how construals are composed from lexical elements.

From Croft (2012) to my system

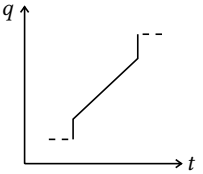
Croft (2012)'s slogan

Two-dimensional "unfolding of events": Each event type (*climb around*, *climb to the top*, ...) has a characteristic sequence of qualitative states.

Activities



Accomplishments



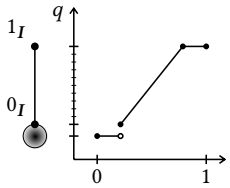
My slogan

Each aspectual type (construal) is defined as a certain trajectory (along with a profiled subpart) within a definite phase space, over a fixed time window.

- Phase space: topological space (points called "phases")
- Trajectory: continuous function

The phase space is not a general conceptual space, but specific to each aspectual type.

Semi-formal accomplishment



Pictures for topological spaces

Topological feature

- Point
- Open point
- Endpoint
- Absence of endpoint
- Area adjacent to the open point

Graphical representation

- Dot (in general)
- Fading interior
- Thick dot
- Horseshoe
- Extra halo

Example (several spaces)



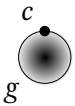

States

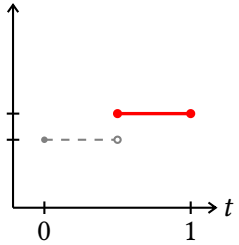
Each aspectual type has...

- a phase space
- a trajectory
- a profiled subpart of its trajectory

Transitory state

- Example: *be at the top*
- two-pointed space
- profile on the second stage



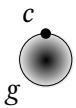


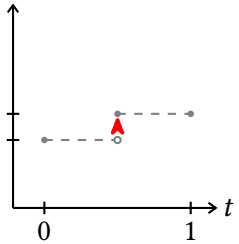
- Open points correspond to “rest-like” qualitative states

Telic predicates (with a natural endpoint)

Achievement

- Example: *reach the top*
- two-pointed space
- profile on the transition (contrary to transitory states)





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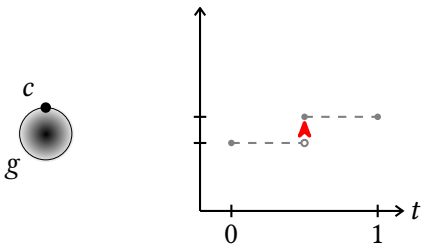
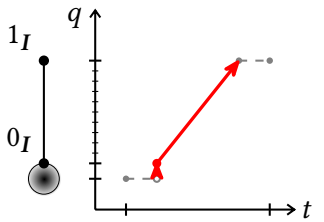


Accomplishment

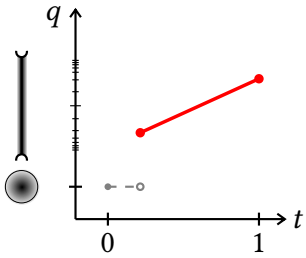
- Example: *climb to the top* (*run a mile*...)
- closed interval with open point
- profile on the entire transition stage



Activities

Undirected activity

- Example: *climb around*
- open interval with generic open point
- profile on the homogeneous non-constant stage



Advantages of the approach

Goal: account for phenomena in aspectual event conceptualization. For this, phase spaces are...

Mathematically explicit (topological spaces)

- how entities can and cannot navigate the qualitative dimension (trajectories)
- how the qualitative dimension can change depending on construal (transformations)
  - in particular, relative granularity of phase spaces

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  - in particular, relative granularity of phase spaces

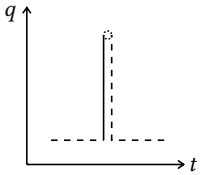
Subject to conditions

- Phase spaces form a natural class with a simple description.
  - viz., nearly one-dimensional manifolds, possibly with boundary
- Shifts in aspectual construal involve different kinds of continuous functions between them
  - Distinction-collapsing (quotients), point-forgetting, cohesion-adding
- ⇒ More constrained framework for aspect, within which to evaluate and conjecture:
  - natural kinds
  - operations

An intermediate aspectual type

Semelfactives

- Brief events which return to their initial state and can be repeated
  - "point events"
  - "full-cycle resettables"
- Examples: *cough*, *flash*, *tap*...
- Telic single-event reading
  1. Wilfrid coughed at noon.
  2. It took ten seconds for Wilfrid to cough.



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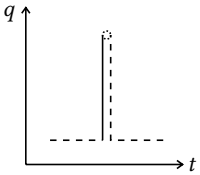
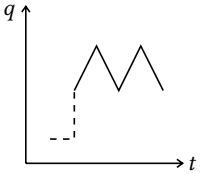


- Atelic multiple-event (iterative) reading
  3. Wilfrid coughed for two minutes.

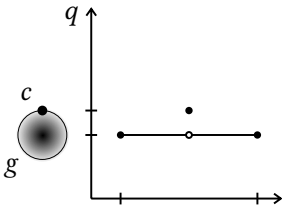


- Semelfactives offer an example of a shift/alternation in aspectual construal.

Peculiar analysis of semelfactives

Croft's view: "cyclic achievements"

- With iteration and "zooming out" operation, yields the aforementioned undirected activity construal
- Unlike any other aspectual type (except his "point states")

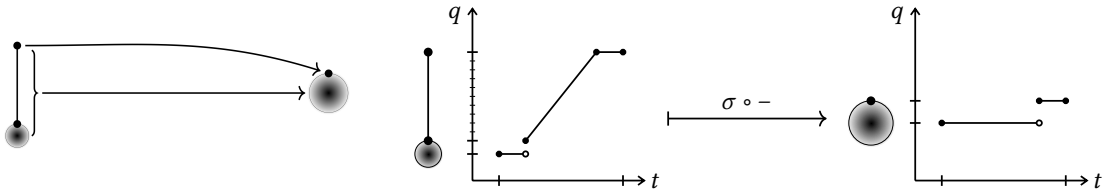


Alternative

Analyze semelfactives as either a telic predicate or as an activity (without result state)

- The imperfective paradox (and others) is available, suggesting an accomplishment.
  1. Bill was kicking the wall when he saw me, so he stopped midway (and didn't kick it).
- An achievement analysis is not excluded, as for all accomplishments, using the quotient:

Example of a transformation: a quotient



How to use a transformation

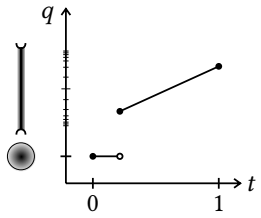
- A continuous function between phase spaces ($\sigma : X \to Y$)...
- ... converts an aspectual type $\langle X, p, ... \rangle$ into a new one $\langle Y, p', ... \rangle$:
  - Transforms the trajectory p within the first space X into another ($p' = \sigma \circ p$) within the second space Y
  - Similarly affects the profiled subpart of the trajectory

Interest

- Relative notion of granularity ("granular" in the context of a transformation)
- Only the qualitative space is affected, instead of the time dimension

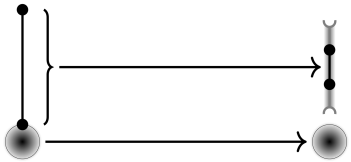
Alternation with undirected activities

- Unlike in Croft's system, undirected activities now involve a homogeneous trajectory.
- How to relate the accomplishment construal of semelfactives with the activity construal?



Solution

- Forget the telicity of the accomplishment construal by embedding the space inside the open interval
- Brings out an atomic minimal event (Rothstein n.d.)



Two transformations relate the different construals of semelfactives:

- collapse distinctions inside the space (quotient): accomplishment ⇝ achievement
- make the space more cohesive (as above): accomplishment ⇝ undirected activity

Forgetful transformations for aspectual verbs (prospective)

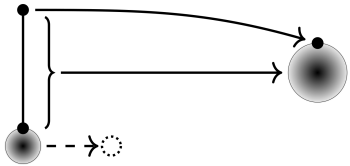
Aspectual verbs

- *start*
- *stop*
- *finish*
- *continue*

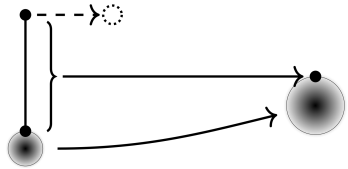
Possible advances

- Reach uniform account of their restrictions by placing conditions on aspectual types for each asp. verb
  - e.g. activities cannot be modified with *finish*.
- *Stop* and *continue* are still up in the air.
  - May require "bridging" by turning telic predicates into undirected activities or transitory states

Finish



Start



Proposals and prospects

Payoffs

- Semelfactives (*cough*, *kick the wall*...) do not receive a "cyclic achievement" construal.
- All achievement verbs (*reach*, *notice*...) receive the same construal.
  - Connected phase space which allows "quantum jumps"
- Other distinctions are rejected
  - Nonincremental vs. incremental accomplishments (*solve the puzzle* vs. *read the book*)
  - Reversibility (*open* vs. *shatter*)

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Prospects

- Explain the topological variation between asp. types entirely with theoretical conditions
  - i.e., why are certain phase spaces/trajectories/transformations available and not others?
  - (spaces: homogeneous subspaces and initial subset; trajectories: canonicity and stages)
  - phase transformations and operations on trajectories
- Testing the system: account for all aspectual verbs (*start, stop, finish*...) in a uniform way
- Give an algorithm to derive the presuppositions of aspectual verbs (Abrusán 2011)

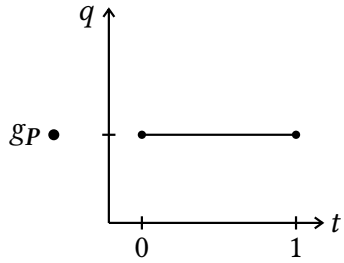
References

- Abrusán, Márta (2011). "Predicting the presuppositions of soft triggers". In: *Linguistics and Philosophy* 34.6, pp. 491–535.
- Comrie, Bernard (1976). *Aspect: An Introduction to the Study of Verbal Aspect and Related Problems*. Cambridge Textbooks in Linguistics. Cambridge University Press.
- Croft, William (2012). *Verbs: Aspect and Causal Structure*. Oxford University Press.
- Rothstein, Susan (n.d.). "Two puzzles for a theory of lexical aspect: Semelfactives and degree achievements". In: pp. 175–198.

Two other aspectual types

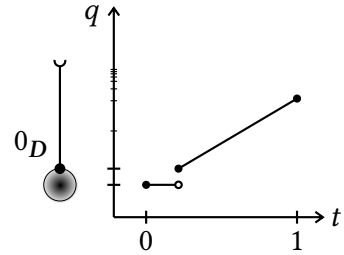
Permanent state

- Example: *be French*
- singleton space
- constant trajectory



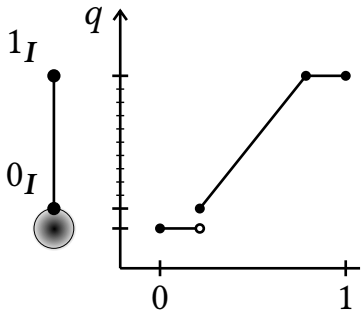
Directed activity

- Example: *climb towards the top*
- half-closed interval with open point
- profile on the non-constant stage



Canonical vs. noncanonical trajectories

A canonical trajectory



Two noncanonical trajectories