Result states and consequent states

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Outline

A puzzle I

- Consider the following two sentences in the present perfect:

1. Rebecca has reached the top of Ben Nevis.
2. Rebecca has climbed Ben Nevis.

- Whereas 1 may be understood as implying that Rebecca is at the top of Ben Nevis, 2 lacks this implication (though 2 is compatible with her being at the top of Ben Nevis).
- What is this difference due to?
- Contrast 2 with 3:

3. Rebecca has climbed up Ben Nevis.

A puzzle II

- Similar to 1 but unlike 2, 3 may be understood as implying that Rebecca is at the top of Ben Nevis (though 3 is compatible with her no longer being at the top of Ben Nevis).
- This is confirmed by the following contrast:

4. Rebecca has climbed up Ben Nevis, so now she can enjoy the view.
5. Rebecca has climbed Ben Nevis, so now she can enjoy the view.

- In 4, Rebecca is most probably at the top of Ben Nevis (from where she can enjoy the view), whereas in 5, she is probably able to enjoy the view from somewhere else.

Moens and Steedman (1988) on the puzzle I

- The contrast between 1 and 2 is pointed out by Moens and Steedman (1988, 19) for comparable examples.
- In their approach, 'Rebecca reach- the top of Ben Nevis' is a culmination (achievement à la Vendler), whereas 'Rebecca climb- Ben Nevis' is a culminated process (accomplishment à la Vendler).
- The perfect is said to take a culmination as its input category and yields the corresponding consequent state.
- The contrast between 1 and 2 is taken to show that the perfect doesn't apply to a culminated process directly.
- A culminated process must first be coerced into a point and then into a culmination in order for the perfect to apply.

Moens and Steedman (1988) on the puzzle II

- After these coercions, the original consequent state of 'Rebecca climb- Ben Nevis', which would be her being at the top, is no longer accessible.
- What the perfect in 2 yields is the consequent state of the culmination that results from coercion, but this consequent state is rather different from the original consequent state, concerning consequences of the culminated process as a whole.
- In sum:
  - Perfect: culmination $\mapsto$ consequent state
  - In 1: perfect(('Rebecca reach- the top of Ben Nevis')$^{\text{culmination}}$)
  - In 2: perfect(('Rebecca climb- Ben Nevis')$^{\text{culminated-process} \rightarrow \text{point} \rightarrow \text{culmination}}$)

Worries about Moens and Steedman's approach I

- Even if we grant that every culmination (achievement à la Vendler) has a consequent state, is it the case that every culmination has a unique consequent state? It seems doubtful that the association of culminations with consequent states is functional.
- Related to this, why are consequent states often so hard to name? Take 2: what is the consequent state of 'Rebecca climb- Ben Nevis'?
- Why are some consequent states rather easy to name? Take 2: the consequent state of 'Rebecca reach- the top of Ben Nevis' is her being at the top of Ben Nevis. Or 3: the consequent state of 'Rebecca climb- up Ben Nevis' is her being at the top of Ben Nevis.

Worries about Moens and Steedman's approach II

- In addition to 3, it is easy enough to find examples with a clear consequent state (in which case the motivation for a coercion strategy is significantly reduced):

6. Rebecca has jumped into the lake.
   (Rebecca was in the lake.)

- At the same time, in addition to 2, it is easy to find examples without an easily identifiable consequent state (in which case it is not clear what the benefit of the coercion strategy is):

7. Rebecca has swum three kilometers.

Parsons (1990) on the perfect I

8. Mary has run.

- According to Parsons (p. 235), 8 is interpreted as:
  For some event *e*: *e* is a running, the theme of *e* is Mary, and *e*'s R-state holds now.
- "*e*'s R-state" is "the resultant state of *e*", also described as "the state of *e*'s having culminated." (p. 234)
- Principle 1: "*e*'s R-state holds at $t \equiv e$ culminates at some time at or before *t*." (p. 234)
- Principle 2: "For any event *e*, the theme of *e*'s R-state = the theme of *e*. (And likewise for states.)" (p. 235)

Parsons (1990) on the perfect II

- On the distinction between "target states" and "resultant states" (p. 235):

> *It is important not to identify the Resultant-state of an event with its "target" state. If I throw a ball onto the roof, the target state of this event is the ball's being on the roof, a state that may or may not last for a long time. What I am calling the Resultant-state is different; it is the state of my having thrown the ball onto the roof, and it is a state that cannot cease holding at some later time.*

A reaction to Parsons (1990)'s approach

- Arguably, Parsons's notion of an R-state is too general to be useful. For R-states to stand a chance of being useful, we would first need to know what kind of state a given R-state is.
- In Parsons's system, since every event culminates, every event has an R-state. Again, without saying more, this seems too general to be useful.
- The parenthetical remark "And likewise for states" in Principle 2 suggests that even states have R-states!

Kamp and Reyle (1993) on the perfect

9. Mary has met the president.

$n\ s\ t\ x\ e\ y$
$t = n$
$t \subseteq s$
mary(x)
$e \supset\!\subset s$
the president(y)
e : x meet y

Figure 1: Kamp and Reyle's analysis of 9 (p. 573)

- t is the reference time; n stands for now.
- $\supset\!\subset$ ('abuts') is a temporal relation between e and s: s starts at the very moment that e ends. ("We only record the purely temporal dimension of the relation between e and s." (p. 573))

A reaction to Kamp and Reyle (1993)'s approach

- Again, in order to be useful, we would need to know more about what kind of state a given abutting state s is, otherwise this account seems too general.
- It is not clear whether Kamp and Reyle (1993) assume that every event has such an abutting state (but, given the possibility of a perfect, they probably do.)
- Not is it clear whether states (e.g. *Mary has been in Budapest*) have abutting states.
- Arguably, a purely temporal account is not sufficient.

Van Eijck and Kamp (1997) on the perfect

10. Bill has smiled.

$e_1 \ e_2$
$u \doteq b$
$\mathrm{smile}(e_1, u)$
$e_1 \rightsquigarrow e_2$
$\tau(e_2) \sqsubseteq n$

Figure 2: Van Eijck and Kamp's analysis of 10 (p. 232)

- $\rightsquigarrow$ is a causal relation between events e and states e' 'which holds between e and e' when e' is the result state of e' (p. 232).
- If $e \rightsquigarrow e'$ holds, then $\tau(e)$ is before $\tau(e')$.

Van Eijck and Kamp (1997) on the perfect

- Van Eijck and Kamp replace Kamp and Reyle's temporal abutment with a causal relation, which may be better, but nothing else is said about what kind of state a given result state e' is. Consequently, the generality problem persists.
- It is also not clear whether Van Eijck and Kamp assume $\rightsquigarrow$ to be functional, though their prose seems to suggest this.

Nishiyama and Koenig (2010) on the perfect

$ev\ ev'\ s\ r$
$\phi(ev)$ $ev' \leq ev$ $\phi(ev')$ $\tau(ev') \prec r$ $X(s)$ $\tau(s) \circ r$

Figure 3: The meaning of the perfect according to Nishiyama and Koenig (p. 619)

- *ev* is an eventuality; *r* is the reference time.
- $\leq$ is the part relation on eventualities; $\circ$ is temporal overlap.
- X is a free property variable for properties of states.
- Note that there's no requirement that *ev* or *ev′* be before *s*.

Nishiyama and Koenig's analysis of an example I

11. Ken has broken his leg.

$ev\ ev'\ s\ r\ n$
ken-break-ken's-leg(ev)
$ev' \leq ev$
ken-break-ken's-leg(ev')
$\tau(ev') \prec r$
$X(s)$
$\tau(s) \circ r$
$r = n$

Figure 4: Nishiyama and Koenig's analysis of 11 (p. 621)

Nishiyama and Koenig's analysis of an example II

- The value of X is determined by a pragmatic principle of informativeness (I-principle).
- A speaker chooses a less informative utterance; the addressee enriches this utterance, trying to find the most specific interpretation that she thinks the speaker intended.
- Example values for X:
  - X = ken's-leg-be-broken ("entailed resultative perfect reading")
  - X = ken-be-behind-in-ken's-project ("conversationally implicated resultative perfect reading")
  - X = ski-jumps-be-difficult ("existential (nonresultative) perfect reading")
- The kind of perfect obtained depends on the value of X.

A reaction to Nishiyama and Koenig's approach

- Nishiyama and Koenig's use of a free property variable X to characterize the states s is an interesting improvement on previous accounts: it entails a more context-dependent view of the meaning of the perfect.
- At the same time, there are potentially many values for X, especially given that Nishiyama and Koenig's analysis is purely temporal. In order for the hearer to interpret the proposition that the speaker intends to communicate, the hearer has to infer the intended value of X, but it is not clear how she manages this. The I-principle seems to be of minimal use here.
- Unless there is a principle that ensures a high success rate for the hearer, it is likely that the hearer often misinterprets sentences in the perfect, yet this does not seem to happen as often as we would expect.

A new direction I

- The strategy: keep a stative analysis of the perfect – though "stative" is no longer always state-denoting – but give up both a purely temporal analysis and a causal analysis.
- Add the idea that the meaning of the perfect includes an "evidence-related" component.
- This idea has antecedents in Inoue (1979), Depraetere (1998), Portner (2003), Caudal and Roussarie (2006), Nishiyama and Koenig (2010), and Schaden (2013), at least on my reading of these authors, and despite the significant differences between them.
- The evidence-related component makes use of a relation 'is evidence for', symbolized by $\multimap$, which is a relation between propositions and sets of properties of states.

A new direction II

12. Representation of the perfect (as a predicate):

$$\lambda\mathcal{S}.\exists e(\mathrm{P}(e) \wedge \tau(e) \prec r) \wedge$$
$$\exists e(\mathrm{P}(e) \wedge \tau(e) \prec r) \multimap \mathcal{S} \wedge$$
$$\mathcal{S} = \lambda Q.\exists s(Q(s) \wedge \tau(s) \circ r)$$

- In prose, the meaning of the perfect is a predicate of sets $\mathcal{S}$ of properties of states such that there is an eventuality e of type P (the given eventuality predicate) before the reference time r and the fact that there is an eventuality of this type before r is evidence for $\mathcal{S}$, where $\mathcal{S}$ is the set of properties Q of states such that there is a state s of type Q and s overlaps temporally with r.

A new direction III

- The evidence-related component may be best treated as a conventional implicature of the perfect.
- Analysis of 2 (*Rebecca has climbed Ben Nevis*) (with existential binding of $\mathcal{S}$):

13. $\exists\mathcal{S}.\exists e(\text{rebecca-climb-ben-nevis}(e) \wedge \tau(e) \prec n) \wedge$
    $\exists e(\text{rebecca-climb-ben-nevis}(e) \wedge \tau(e) \prec n) \multimap \mathcal{S} \wedge$
    $\mathcal{S} = \lambda Q.\exists s(Q(s) \wedge \tau(s) \circ n)$

- Example Q-properties (depending on the context, there may be many):
  - $\lambda s.\text{rebecca-be-good-climber}(s)$
  - $\lambda s.\text{rebecca-have-climbing-experience}(s)$
  - $\lambda s.\text{rebecca-be-willing-to-take-challenges}(s)$

A new direction IV

- Unlike in Nishiyama and Koenig's approach, here there is no need for the addressee to find a specific value for a free property variable, because the property variable Q isn't free (and nor is $\mathcal{S}$).
- This treatment helps to account for the difficulty of saying what "the consequent state" of 2 is: "the consequent state" is now a set of properties of states for which the occurrence of the event of the type in question provides evidence – there's no longer any individual state that is "the consequent state."
- Analysis of 3 (Rebecca has climbed up Ben Nevis):

A new direction V

14. $\exists\mathcal{S}.\exists e(\text{rebecca-climb-up-ben-nevis}(e) \wedge \tau(e) \prec n) \wedge$
$\exists e(\text{rebecca-climb-up-ben-nevis}(e) \wedge \tau(e) \prec n) \rightarrow \mathcal{S} \wedge$
$\mathcal{S} = \lambda Q.$
$Q = \lambda s'.\text{rebecca-be-at-the-top-of-ben-nevis}(s') \wedge$
$\exists s(Q(s) \wedge \tau(s) \circ n)$

- In the case of a lexically-syntactically entailed result state property, as in 3, the perfect may select that property, as in 14.
- In such cases, the set $\mathcal{S}$ is a singleton, which corresponds to the impression that there's a "unique consequent state" at issue. (Even so, strictly speaking, it's the result state property that is unique, not the individual result state.)

A new direction VI

- Informally, the occurrence of an eventuality that has a result state is evidence *par excellence* for that result state.
- Another option is for the perfect not to select a lexically-syntactically entailed result state property, so 3 may also receive an analysis similar to the analysis in 14 for 2, in which case the set $\mathcal{S}$ isn't a singleton.

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