

Result State Predications

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What this talk is about

- ▶ Certain eventive verbs make result states accessible for phrasal semantic composition
- ▶ Different aspects of this phenomenon have been studied by various researchers including Kamp (previous talk and previous work), Kratzer (1994, 1996, 2000), Piñón (1999), von Stechow (1996, 2002, 2003a, 2003b), Embick (2005)
- ▶ This talk makes a proposal about the lexical denotation of such verbs and the operators/modifiers that combine with them

A set of related phenomena

- ▶ Modification of result state predications of eventive predicates
- ▶ Resultative vs. existential perfect
- ▶ Adjectival deverbal participles
- ▶ Restitutive *again*
- ▶ Secondary resultative predications

Temporal modification of the result state predication

- ▶ Modifiers with a ‘homogeneity’ requirement, like *for*-phrases and durative *until*-phrases, can combine with ‘non-homogeneous’ predicates without a regular repetition implication.

- (1) They closed the road for two months.
↪ *The road was closed for two months*
- (2) I will draw the curtains until the sun rises.
↪ *The curtains will remain drawn until the sun rises*
- (3) We opened the balcony door (for) the entire night.
↪ *The balcony door was open the entire night*
- (4) They postponed the meeting until next week.
↪ *No meeting until next week*

Readings of the perfect

- (5) John has put the cake in the oven. RESULTATIVE
↪ *The cake is in the oven.*
- (6) John has visited Stuttgart many times. EXISTENTIAL
↪ *Many separate visits to Stuttgart preceding now*
- (7) John has lived in Stuttgart for the last three years. UNIVERSAL
↪ *Continuous living in Stuttgart extending to now*

Result state predications in adjectival participles

- ▶ Kratzer (2000): use potential non-persistence of result state predications as a diagnostic for the kind of stative predication involved in participles
- ▶ Participles of different verbs can have a different meaning
- ▶ *noch immer/still* presuppose a potential transition from a positive phase to a negative phase and asserts that the reference time is within the positive phase
- ▶ Only one type of participles is acceptable with *noch immer/still*

Result state predications in adjectival participles

- (8) The window is still opened.
↪ *Window still open*
- (9) The meeting is still postponed.
↪ *Still no meeting*
- (10) The office is (# still) emptied.
- (11) The lake is (# still) dried.
- (12) The theorem is (# still) proven.
- (13) The package is (# still) delivered.

Restitutive *again*

- ▶ With some change of state verbs the presupposition of *again* targets a result state predication associated with the verb

- (14) We opened the entrance to the cave again.
compatible with: *Cave first open, then closed, then open as a result of our opening it*
- (15) The satellite entered the earth again.
compatible with the satellite having left the earth only once
- (16) We put the liquid into the hole again.
compatible with: *Liquid first in the hole, then out of the hole, then in the hole as a result of our putting it there*

Secondary resultative predications

- (17) Ed hammered the metal flat.
 \Leftrightarrow *The metal became flat as a result of Ed hammering it*
 \Leftrightarrow *Ed hammered the metal until it was all flat*
- (18) They closed the door shut.
- (19) They opened the window wide open.
- (20) They shot him dead.

Participles vs. the other phenomena

- (21) (22) The office is (# still) emptied.
- (23) They emptied the office for three months.
 ↔ *The office was empty for three months after it was emptied*
- (24) They emptied the room again.
 restitutive reading possible
- (25) They emptied the cellar completely empty.

Issues

- ▶ How result state predications become visible
- ▶ Lexical denotations and lexical decomposition
- ▶ Need for decomposition in the syntax

Kratzer (2000): two kinds of adjectival participles

Three types of change of state verbs

- ▶ Class A: change of state verbs expressing relations between events and ‘target states’ (in Parson’s 1990 terms)
- ▶ Class B: change of state verbs existentially quantifying over the target state
- ▶ Class C: change of state verbs making no reference to ‘target states’

(26) Class A:
‘open_V’: $\lambda x \lambda s \lambda e (\text{opening}(e) \wedge \text{open}(x)(s) \wedge \text{cause}(s)(e))$

(27) Class B:
‘empty_V’:
 $\lambda x \lambda e \exists s (\text{emptying}(e) \wedge \text{empty}(x)(s) \wedge \text{cause}(s)(e))$

(28) Class C:
‘prove’: $\lambda x \lambda e (\text{prove}(x)(e))$

Kratzer (2000): two kinds of adjectival participles

Two kinds of aspectual operators deriving participles

- ▶ one kind of participle is derived via an aspectual operator (a stativizer) that makes reference to ‘target states’, just like the resultative perfect
- ▶ another kind of participle is derived via an aspectual operator that yields properties of times just like the existential perfect
- ▶ acceptability with *noch immer/still* indicates a participle of the first kind
- ▶ unacceptability with *noch immer/still* indicates a participle of the second kind

(29) Stativizer 1 = R-Perfect: $\lambda R \lambda s \exists e R(s)(e)$

(30) Stativizer 2 = E-Perfect: $\lambda P \lambda t \exists e (P(e) \wedge \tau(e) \prec t)$

Eventive and stative manifestations of a verb

- ▶ Eventive and stative manifestations of a predicate depend on the aspectual operator that has applied to it
- ▶ In addition to the stativizers, there is an aspectual operator applying to Class A predicates to existentially close off the state variable and produce a predicate of events

(31) Eventivizer: $\lambda R \lambda e \exists s R(s)(e)$

The proposal in Condoravdi & Deo (2008)

- ▶ The denotations of change of state eventive verbs that make result states accessible for phrasal semantic composition pair an eventive component with a stative component.
- ▶ The main concern of that work was to analyze the well-known grammaticalization path
RESULTATIVE \gg PERFECT \gg PERFECTIVE,
focusing on the instantiation of the path in Indo-Aryan
- ▶ We made a proposal about the semantic content of these categories at each synchronic stage
- ▶ We characterized the shifts as instances of semantic generalization (weakening)

Paired lexical denotations

- ▶ Change of state verbs like *yoke* have purely eventive denotations, as in (32) and (33)
- ▶ They also have denotations that pair the eventive component with the stative component of their meaning, as in (34) and (35)

(32) $\lambda y \lambda x \lambda e$ put-yoke-on(e) \wedge Agent(e, x) \wedge Patient(e, y)
 x yokes y

(33) $\lambda y \lambda z \lambda x \lambda e$ connect-to-with-yoke(e) \wedge Agent(e, x) \wedge
Patient(e, y) \wedge Theme(e, z) [x yokes y to z]

(34) $\langle \lambda e$ put-yoke-on(e), $\lambda y \lambda s$ have-yoke-on(s)(y) \rangle

(35)
 $\langle \lambda e$ connect-to-with-yoke(e), $\lambda z \lambda y \lambda s$ connected-to-with-yoke(s)(y)(z) \rangle

- ▶ Pairs such as those in (34), (35) are projected to the syntax and enter semantic composition, where the arguments of the stative predicate will be saturated.
- ▶ The output is paired eventive-stative property sentence radicals.

(36) The dolphin has been yoked to the chariot.

(37)

$\langle \lambda e \text{ connect-to-with-yoke}(e), \lambda s \text{ connected-to-with-yoke}(s)(d)(c) \rangle$

Resultative Perfect

- ▶ The resultative perfect RESPERF applies to paired property sentence radicals $\langle P, Q \rangle$ and instantiates the two properties via paired property instantiation
- ▶ Paired property instantiation relates event and state via the result relation
- ▶ result for lexically paired properties amounts to historical necessity encoded in meaning postulates (constraints on models)
- ▶ The reference time r specified by tense has to be one of the elements of $\text{RESPERF}(\langle P, Q \rangle)$

(38) $\text{RESPERF} = \lambda R \lambda i \text{INST}^2(R, i)$ defined only if $R = \langle P, Q \rangle$ with $P \subset \mathcal{E}^E$, the set of events, and $Q \subset \mathcal{E}^S$, the set of states

(39) **Paired Predicate Instantiation**

$$\text{INST}^2(\langle P, Q \rangle, i) = \\ \exists e \in \mathcal{E}^E \exists s \in \mathcal{E}^S [P(e) \wedge Q(s) \wedge \text{result}(e, s) \wedge i = \tau(s)]$$

Resultative Perfect

- (40) The dolphin has been yoked to the chariot.
- (41) $\exists e \in \mathcal{E}^E \exists s \in \mathcal{E}^S [\text{connect-to-with-yoke}(e) \wedge$
 $\text{connected-to-with-yoke}(s)(d)(c) \wedge \text{result}(e, s) \wedge \text{Now} = \tau(s)]$

Existential Perfect

- ▶ PERF applies to sentence radicals of the regular type
- ▶ The meaning in (42) is, in effect, the ‘extended now’ analysis of the perfect (McCoard, 1978; Dowty, 1979; Iatridou et al., 2001, among others).

$$(42) \quad \text{PERF} = \lambda P \lambda i \exists j (i \sqsubseteq_{\text{final}} j \wedge \text{NFINST}(P, j, i))$$

$$(43) \quad \text{NFINST}(P, j, i) \text{ is defined only if } i \text{ is a final subinterval of } j \\ \text{NFINST}(P, j, i) = \exists k (\text{INST}(P, k) \wedge k \sqsubseteq j \wedge \neg(i \circ k)) \text{ if defined}$$

$$(44) \quad \text{INST}(P, i) = \begin{cases} \exists e \in \mathcal{E} (P(e) \wedge \tau(e) \subseteq i) & \text{if } P \subseteq \mathcal{E} \\ P(i) & \text{if } P \subseteq \mathcal{T} \end{cases}$$

Result states in the meaning vs. in the lexical denotation

- ▶ Result states can be entailed by a certain predicate but not be made accessible for modification by that predicate
- ▶ The perfect applied to such predicates is the existential perfect
 - ▶ The presence of an inference about the result state holding at the reference time is compatible with the existential perfect and does not necessitate the resultative perfect

(45) John has promised to pick me at the airport.

↔ *John is under an obligation to pick me up at the airport*
(Searle 1964)

↔ *John is committed to making the right action choices so as to realize picking me at the airport* (Condoravdi & Lauer 2011)

(46) (#) John promised to pick me at the airport until he got sick.
acceptable only on repeated promises scenario

Adjectival participles

(47) The dolphin is yoked to the chariot.

(48) The metal is flattened.

- ▶ A stativizer applies to paired eventive-stative properties to yield a property of states and instantiating the eventive component
- ▶ Does the operator apply lexically or syntactically?

(49) $\text{STATE}(\langle P, Q \rangle) = \lambda s \exists e (P(e) \wedge Q(s) \wedge \text{result}(e, s))$

(50)

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graph TD; A[AspP/AdjP?] --- B[STATE]; A --- C[vP]; C --- D[DP]; C --- E[v]
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AspP/AdjP?

STATE vP

 DP v

Eventive readings with accessible result state predications

(51) They closed the road for two months.

(52) We opened the entrance to the cave again.

- ▶ Paired eventive-stative properties project to syntax
- ▶ The stative component is accessible to temporal modifiers like *for* and *until*-phrases and *again*
- ▶ Eventually an eventive operator applies to paired eventive-stative properties to yield a property of events and instantiating the stative component

(53) $\text{for}(2 \text{ months})(\langle P, Q \rangle) = (\langle P, \text{for}(2 \text{ months})Q \rangle)$

(54) $\text{EVENT}(\langle P, Q \rangle) = \lambda e \exists s (P(e) \wedge Q(s) \wedge \text{result}(e, s))$

Secondary resultative predications

(55) Ed hammered the metal flat.

- ▶ Here the pairing between eventive and stative properties happens in the syntax
- ▶ EVENT applies to the pair and the meaning is the same as with other eventive predicates that make accessible implicitly stative predicates
- ▶ Existential perfect can apply to predicates including a secondary resultative predicate with an inference that the result state holds at the reference time
- ▶ In this case, however, the result relation is not regulated by meaning postulates
- ▶ result as causal sufficiency?

The restriction on secondary resultative predicates

- ▶ Embick (2005) observes that secondary resultative predicates have to be plain adjectival phrases and cannot be adjectival participles
- ▶ He accounts for that by assuming that
 - ▶ secondary resultative predications project a structure in which the sister of *v* has to be an AdjP
 - ▶ by analyzing adjectival participles with syntactic decomposition and as forming AspP phrases

(56) Ed hammered the metal flat.

(57) #Ed hammered the metal flattened.

Secondary resultative predications

- ▶ The generalization is actually that adjectival participles are unacceptable with eventive-stative participles
- ▶ Stative participles are fine
- ▶ Eventive-stative participles are acceptable with non-eventive predicates
- ▶ States cannot be related via the result relation to events of partially disjoint event types.
- ▶ (58) asserts of the state of the metal being flat that it is the result of a hammering event and of a flattening event.

(58) # Ed hammered the metal flattened.

(59) Ed hammered the metal flattened in the middle.

(60) We made the skirt lengthened in the middle.

(61) Open the window and keep it open/opened.

Back to adjectival participles

- ▶ Does the stativizer operator apply to paired-predicate verbal denotations lexically or syntactically?
- ▶ One reason to have it apply syntactically would be to distinguish between plain adjectival and derived adjectival predicates as secondary resultative predicates, following Embick (2005)
- ▶ But if that fact actually has a semantic explanation, adjectival participles can be derived in the lexicon via application of STATE
- ▶ In that case, the only reason to have a partial syntactic decomposition of adjectival participles would be restitutive *again*

(62) The entrance to the cave is opened again.