Inherent Polysemy of Action Nominals

Chiara Melloni (University of Verona)
Elisabetta Jezek (University of Pavia)

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Claims

- The Event/Result polysemy of deverbal nominals is a special case of inherent polysemy (*complex type* or *dot object*, cf. Pustejovsky 1995), since it is dependent on the meaning of the base verb.

- For creation nominals, the complex type is better characterized as *event*•(*result*-)*object* rather than *event*•*event* or more specifically *process*•(*result*-)*state* (as in Pustejovsky 1995).

- The result interpretation may introduce reference to an entity which does not correspond to a syntactic argument of the base verb.

  We propose to codify this entity in the form of a semantic participant (or *hidden argument*, cf. Badia and Saurí 2001) in the Qualia Structure of the base verb and of the corresponding nominal.

- The internal structure of event•result dot nominals is asymmetric: problems with co-predication follow from the formal and semantic asymmetry of such nominals.

Data structure

- All our data is taken from the ITWaC corpus (Italian Web as Corpus – cf. Baroni and Kilgarriff 2006)
- In the corpus we look for empirical evidence of the event/result ambiguity.
- For data extraction, we use the Word Sketch Engine corpus query tool (Kilgarriff et al. 2004)
- Our methodology is as follows (see Rumshisky et al. 2007, later adopted in Jezek 2008):
  - For each nominal, we extract the most salient verbal and adjectival collocates.
  - We cluster the selectors according to the sense of the nominal that they pick out in context.
  - In this way, we are able to tell apart event readings from result readings on empirical grounds.
  - We provide a sentence which is indicative of each reading.
  - We extract co-predication contexts through CQL regular expressions that look for the typical linguistic contexts in which co-predications may apply.

construction (event•result)

- **Selecting Verbs**:
  - (a) Event: *finance, complete, supervise, authorize, allow, start, oppose*
  - (b) Result: *examine, build*

- **Adjectival Modifiers**:
  - (a) Event: *possible, widespread, careful*
  - (b) Result: *wooden, solid, robust, impressive*

  - The EC has financed the **construction** of a road cutting through one of Zaire's forests (event)
  - Causal inferences are **constructions** built upon foundations of assumptions (result)
  - The inter-war period saw the **construction** of a large number of new pubs (event!)

Inherent polysemy of Action Nominals

- Why is the polysemy of action nominals 'inherent'?

  The result sense is not 'shifted' from the event sense in context (as with 'meaning transfers', cf. Nunberg 1995), but is lexically specified.

  In the semantic structure of the base verb (and of the forming suffixes) we find all the elements to obtain the polysemy aspects of the derived nominal.

- Event Structure considerations:

  causative and other accomplishment verbs are optimal candidates for yielding polysemous nominals, since the notion of result is tied to the notion of Complex Event Structure, and in particular to the state subevent in the ES of the base verb.

- More idiosyncratic meaning aspects of the base verb are also relevant for determining the chance of a result object interpretations, as extensively argued in the literature (Levin 1993, Ehrich and Rapp 2000, Melloni 2007).

Inherent polysemy (cont'd)

- The special nature of these dot objects lies in the asymmetry – at the ontological level – between the types making up the complex type.
  - Not only are events and objects radically distinct ontological categories, but the result-object type is temporally and causally dependent on the event type since the performance of the event is the pre-condition for the (coming into) existence of the result.
  - This claim finds empirical support in the absence of co-predication contexts in the corpus where the result reading is referred to before the event reading. (See Asher and Pustejovsky 2005 for similar observations on copredication issues: "The felicity of copredications often depends on the order of the predications as well.")

Inherent polysemy (cont'd)

- While there are events that do not yield results (intended as causal concrete or abstract by-products of the action), and accordingly there are unambiguous event-denoting nominals (cf. *annientamento* 'annihilation', *abolizione* 'abolition') …

- … the reverse situation does not hold. There are no results without a causing event, and unambiguous result-denoting nominals are idiomatized/lexicalized.

  - At times, events yield results but the derived nominals are unable to refer to them (cf. English *–ing* nominalizations as *burning* – Pustejovsky 1995, Asher 1993).

Standard cases of dot objects

- The temporal and causal asymmetry found in event•result-object nominals is missing in standard cases of dot objects, even in event•object dot types, such as *pranzo* ‘lunch’, where the senses in the complex type are mutually interdependent.

- The object sense of *pranzo* corresponds to what is consumed during the event and no result is at stake.

Deverbal nominals and the E•R polysemy

- Since causality is tied to the notion of (complex) Event Structure, crucially restricted to the V category (cf. Grimshaw 1990, Pustejovsky 1991, Levin & Rappaport Hovav 1998, a.o.), we derive that only nominals obtained from verbs are potential bearers of this special pattern of polysemy.

- This explains why – notwithstanding the general consensus on the similarity of polysemy patterns in the morphologically simplex and complex lexicon (cf. Apresjan 1973) – only can morphologically complex nouns refer to the abstract or concrete result of an event.
  - A few English (dubious) counterexamples of morphologically simplex nouns are quoted in Pustejovsky 2005 (cf. *music*, *design*).

What types make up the complex type?

- According to Pustejovsky (1995), process-result nominals can be classified as dot objects where both the dot elements are typed as event.
  - *event•event* or, more specifically, *process•*(*result-*)*state*.

- For these nominals, three interpretations are available: process, result and process•result respectively:

  (a) John fell from the ladder during the construction of the roof frame (process)
  (b) With the construction of the roof complete, John can start shingling (result-state)
  (c) John's construction of the roof frame for the house was done yesterday (process•result)

- For nominalizations which are derived from verbs of creation (e.g. *building*, *construction* etc.), the result interpretation may correspond either to the individual which is created as a result of the initial process (d below), or to the state itself (b above).

  (d) The construction is standing on the next street (result-object)

Result-State or Result-Object?

- The result-state interpretation is available to certain nominals (e.g. *isolamento* 'isolation', expressing the process and the state), but is generally not accessible to nominals obtained from verbs expressing events which put a new entity into existence (creation and redescription predicates).

- Creation and redescription nominals have a complex event as part of their meaning but are unable to refer to the resulting state of this event.
  - e.g. *costruzione* 'construction' or *traduzione* 'translation' cannot refer to the state of being constructed or translated, nor can they denote the state of existence of the construction and translation respectively.
  - They can instead refer to the concrete or abstract objects obtained by the corresponding event.
    - R: Questa **costruzione** è fatta interamente di legno.
      This construction is entirely made of wood.
    - R: Questa **traduzione** è piena di errori.
      This translation is full of misused expressions.

Result-State or Result-Object? (cont'd)

- For creation and redescription nominals, the notion of result hinges primarily on the concept of abstract or physical object yielded by a corresponding event instead of the resulting state.

- The event/result polysemy exhibited by creation and redescription nominals should be classified primarily as event•(result)object, rather than process•(result)state.

  - the 'object' type is the hyperonymic category of 'results' intended as the causal by-product of an event.

- Nominals such as *ostruzione* 'obstruction', or *connessione* 'connection' can instead refer to the process/event, to the result state, and to the object.

  - Why it is so?

What blocks the state interpretation for creation and redescription nominals?

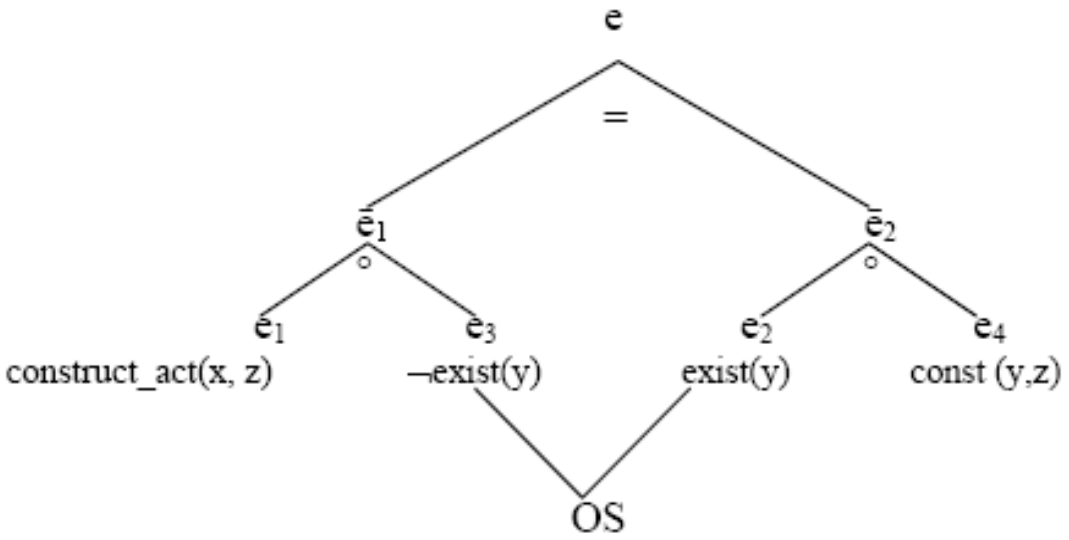
- A possible explanation lies in the peculiar ES (LCS) of the base verbs.

- As argued in L&RH (1999:213), the base verbs take incremental themes.
  In the ES of the base verbs: EVENT Co-IDENTIFICATION
  under the following conditions:
  - a. The subevents must have the same location and must necessarily be temporally dependent.
  - b. One subevent must have a property that serves to measure out that subevent in time; this property is predicated of an entity that is necessarily a participant in both subevents.

  LCS of Causatives: [[x ACT $_{<MANNER>}$] CAUSE [BECOME [y <*STATE*>]]]
  - Observe that, if the two subevents are co-identified → no direct access to the Become subevent and to the resulting state either.

Opposition Structure

- Pustejovsky (2000): the predicative structure of creation predicates (cf. *costruire* 'construct') is a "gating function", expressing the predicate opposition between a not existing object (y) and then coming into existence.
  - *costruire* 'construct' (x, y, z), with event coidentification (=)



Costruzione E•R-Object

EVENTSTR =
- E_1 = **e_1: process**
- E_2 = **e_2: state(s) of existence**
- RESTR = event co-identification **e_1=e_2**

ARGSTR =
- (d)ARG1 = x: **animate individual**
  - FORMAL = **phys obj**
- (d)ARG2 = y: **artifact**
  - CONST: z
  - FORMAL = **entity**
- (d)ARG3 = z: **material**
  - FORMAL = **mass**

QUALIA =
- **event•result-object_lcp**
- FORMAL: **cause (e,y)**
- AGENTIVE: **construct (e_1=e_2,x,z,y)**

Result-Objects as Hidden Arguments

- While the necessary condition for a result interpretation is the existence of an event (i.e. there cannot be a *result* without an event that brings it about), the result does not necessarily correspond to a syntactic argument of the base verb.

- *translation*: the result (i.e. *translation* = informational object) is temporally and causally dependent on the event's accomplishment.
- However, the result is not expressed by a dedicated DP in the syntax of the corresponding base verb.

- *translate*:

  The author translated the book in English.

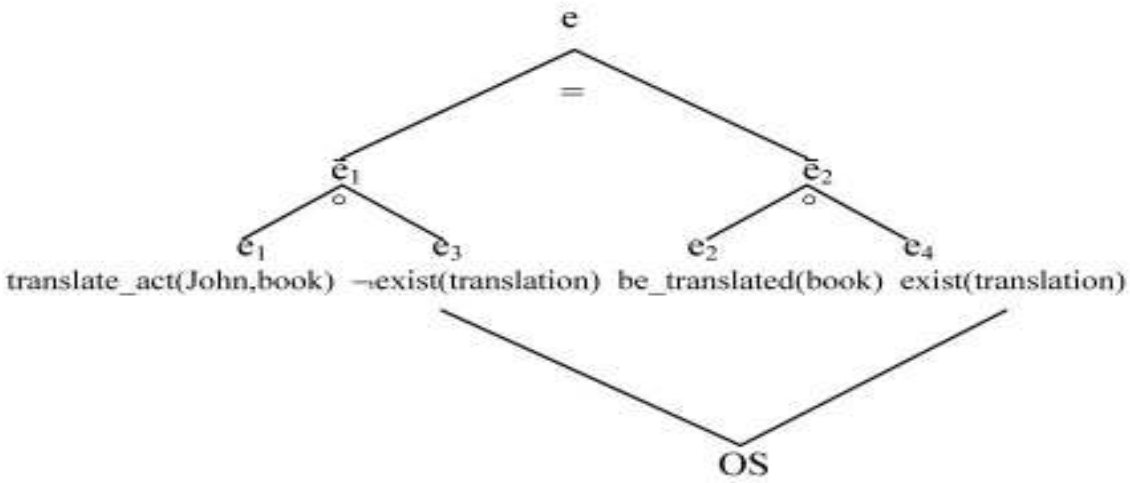
- There is no binding of an argument structure participant

  The English translation is full of mistakes.

Opposition Structure

- *translate* (John, book, *translation*), with event co-identification (=)
- *translation* as the hidden argument is put into existence: the opposition structure is

  <¬exist (translation), exist (translation)>



Traduzione E•R-Object

EVENTSTR =
- E_1 = **e_1: process**
- E_2 = **e_2: state(s) of existence**
- RESTR = event co-identification **e_1=e_2**

ARGSTR =
- (d)ARG1 = x: **human**
  - FORMAL = **phys obj**
- (d)ARG2 = y: **artifact**
  - FORMAL = **info_physobj**
- (**h**)ARG3 = z: **artifact**
  - FORMAL = **info_obj**

QUALIA =
- **event•result-object_lcp**
- FORMAL: **cause (e,y)**
- AGENTIVE: **translate (e_1=e_2,x,z,y)**

Co-predication with Event•Result-Object dot types

- Problems with co-predication[1] in case of **coordinate** predicates

Nominals from *creation* verbs

- It. *La creazione della scultura da parte dell'artista è cominciata due mesi fa ed è molto originale.
- 'The creation of the sculpture by the artist began two months ago and is very original'.
- Fr. *La construction du Moulin par les ouvriers a commencé hier et est très jolie.

Nominals from *redescription* verbs

- It. *La traduzione dell'Amleto (di quel giovane traduttore) va avanti da oltre due mesi ed è piena di parole bizzarre.
- 'The translation of the Hamlet (by that young translator) began two months ago and is full of weird words.'
- Fr. *La reproduction de ce tableau par l'artiste dure depuis deux jours et est accrochée au mur.

[1] French examples from Jacquey (2001).

Dot types and Co-predication

- From Asher and Pustejovsky (2005)

- Not all copredications involve dot objects…
  - a. Arnold's cigar is Cuban and lasted the whole afternoon.
  - b. Your last glass of wine was a Merlot and lasted half an hour.
  - c. She opened the wine and poured some into the glass (from Pustejovsky and Jezek 2008).

- …semantic anomaly with certain co-predications does not imply absence of inherent polysemy:
  - d. !The newspaper was founded in 1878 and weighs 5 lbs.

Co-predication with Event•Result-Object dot types

- Semantic anomaly with co-predications of E•R-O nominals is expected:

- semantic asymmetry between the types: there is no mutual interdepence between the types in the complex (unlike standard dot objects such as *book*, or *window*). The result type is the causal by product of the Event type; it is thus dependent on the Event type, but not viceversa.

- formal asymmetry: E deverbal nominals may retain verb argument structure. This fact can produce inaccessibility to the R type in context when the result nominal absorbs the verb internal argument (blocking its projection in syntax), as it happens with creation nominals (cf. *costruzione*).

Co-predication with Event•Result-Object dot types

- Co-predication works better (but not perfectly) in case of:

  (i) Insertion of a relative clause;
  (ii) Introduction of temporal disjunction between the predicates;
  (iii) Elimination of the argument(s) which elicit the event interpretation.

  - (see Jacquey 2001 for a similar analysis on French data)

Co-predication: *costruzione*

La costruzione, che si protrasse$_{E}$ fino al XVII secolo, rimane un'importante testimonianza$_{R}$ della geniale tematica del Palladio.

→ *protrarre* 'continue' selects the Event type

→ *rimanere un'importante testimonianza 'represent an important evidence'* selects the Result type

- Copredication is possible because:
  - the E-type selector is introduced in the relative clause;
  - temporal disjunction: Past for the E-type selecting predicate, Present for the R type selecting predicate;
  - omission of the internal argument: the result interpretation would be blocked in case of internal argument projection.

Co-predication: *traduzione*

La traduzione, che è stata coordinata$_{E}$ dal prof. Sandro Schipani, […] rappresenta uno dei risultati$_{R}$ più rilevanti di una estesa collaborazione […]

→ *coordinare* 'coordinate' selects the Event type

→ *rappresentare uno dei risultati* 'represent one of the results' selects the Result type

- Copredication is possible because:
  - the E-type selector is introduced in the relative clause;
  - temporal disjunction: Past for the E-type selecting predicate, Present for the R type selecting predicate;
  - omission of the internal argument: irrelevant for redescription nominals (they allow internal argument projection in the R reading).