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POSS-*ing* as Kimian states

Presentation at NELS53

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Universitat Pompeu Fabra

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**Universitat
Pompeu Fabra**
Barcelona

Natural language ontology

What are the kinds of things that we use to conceptualize the world - according to our natural language?

Objects, events, worlds, propositions, more abstract objects...

In this talk I will show how Kimian states help us model the denotation of POSS-*ing*.

Nominalized gerunds in English

POSS-*ing*	**Clay's**	**winning the game**	was surprising.
	possessor	*-ing* form with direct complement	
ACC-*ing*	Clay	winning the game	was surprising.
-ing-of	Clay's	winning of the game	was surprising.

There is a rich literature on their syntax (Abney 1987, Alexiadou 2001, Borer 2013, Iordăchioaia 2020 etc.)

POSS-*ing* does not denote events

Maienborn (2005): Ontological properties of eventualities

- ► Eventualities are perceptible.
    - ► Perception verbs: *Hannah watched Clay's performing the song.
- ► Eventualities can be located in space and time.
    - ► *Take place* at time/place: *Clay's performing the song took place last Tuesday/at the opening ceremony.
- ► Eventualities can vary in the way that they are realized.
    - ► Manner predication: *Clay's performing the song was passionate.

POSS-*ing* does not denote events

Vendler (1967): Narrow containers

(1) Clay's performance of the song occurred at 11pm/took place in Florida/was fast.

(2) *Clay's performing the song occurred at 11pm/took place in Florida/was fast.

Vendler proposed that POSS-*ing* denote facts. They can be paraphrased by *the fact that*:

(3) *The fact that Clay performed the song occurred at 11pm/took place in Florida/was fast.

(4) The fact that Clay performed the song was surprising.

What does POSS-*ing* denote?

- Vendler (1967): facts
- Portner (1992): sets of minimal situations
- Asher (1993): facts, possibilities
- Zucchi (1993): states of affairs
- Grimm & McNally (2015): event kinds
  ...
- This presentation: Kimian states

  Abney (1987): "Richard Larson suggested VP-*ing* denotes a property
  which is possessed by the subject."

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Kimian states

Kim (1976): "Events are exemplifications by substances of properties at a time."

$$[x, \qquad P, \qquad t]$$
$$\text{object} \quad \text{property} \quad \text{time}$$

Maienborn (2005): Copular structures and some stative predicates denote K-states.

(5)   Hannah is blond. $[h, \text{BLOND}, t]$

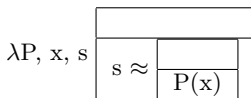(6)   George weighs 80 kg. $[g, \text{WEIGH-80-KG}, t]$

(7)   The lamp stands on the table.
$[s^e, l, t \mid \text{STAND}(s), \text{THEME}(s, l), \text{LAMP}(l), \text{ON}(s, t), \text{TABLE}(t)]$
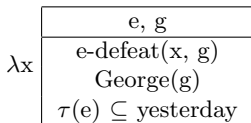
(See also Fábregas & Marín 2010 for its application in Spanish)

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Kimian states in DRT

Basic form of a K-state (adapted from Asher 1993, Maienborn 2005):

$$\lambda P, x, s \begin{array}{|c|c|}\hline & \\ \hline s \approx & \begin{array}{|c|}\hline \\ \hline P(x) \\ \hline \end{array} \\ \hline \end{array}$$

POSS-*ing* contains an IP structure (Abney 1987, Asher 1993) so it introduces a subDRS. The VP-*ing* part offers the property in K-state:

$$\lambda x \begin{array}{|c|}\hline e, g \\ \hline e\text{-defeat}(x, g) \\ George(g) \\ \tau(e) \subseteq \text{yesterday} \\ \hline \end{array}$$
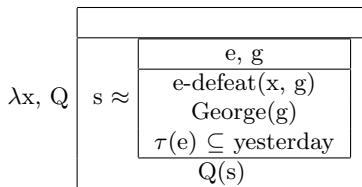
Clay's defeating George yesterday

Kimian states in DRT

The referent s for the K-state is provided by the null determiner in the POSS-*ing*:

$$
\lambda x, Q \quad s \approx
\begin{array}{|c|}
\hline
\text{e, g} \\
\hline
\text{e-defeat(x, g)} \\
\text{George(g)} \\
\tau(e) \subseteq \text{yesterday} \\
\hline
Q(s) \\
\hline
\end{array}
$$

Clay's **defeating George yesterday** was surprising.

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Kimian states in DRT

Introducing possessor and matrix predicate:

c, s
Clay(c)

$$s \approx \boxed{\begin{array}{c} \text{e, g} \\ \hline \text{e-defeat(c, g)} \\ \text{George(g)} \\ \tau(e) \subseteq \text{yesterday} \end{array}}$$

surprising(s)

Clay's defeating George yesterday was surprising.

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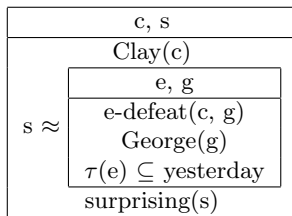
Ontological properties of K-states

Maienborn (2005), adapted from Asher (1993):

← Concrete objects		Abstract objects →	
... Event, State,		K-state,	Fact, Propositions ...
[spatiotemporal]		[temporal]	[not temporal or spatial]

Ontological properties of K-states:

▶ K-states are not accessible to direct perception and have no location in space.

▶ K-states are accessible to higher cognitive operations, such as anaphoric reference.

▶ K-states can be located in time.

Ontological properties of K-states

▶ The following judgments are based on corpus data: 1411 POSS-*ing* tokens extracted from a dependency-parsed version of the British National Corpus (BNC).

(P1) K-states are not accessible to direct perception and have no location in space.

▶ Perception verbs: Not attested
*Hannah saw/heard/watched Clay's winning the game.

▶ Spatial location: Not attested
*Clay's winning the game took place/occurred in Florida.
*Hannah was at/above/below/behind Clay's winning the game.
*Here is the place of Clay's winning the game.

▶ Spatial modifier is always contained in the VP-*ing*:
[Clay's winning the game in Florida] was surprising.

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Ontological properties of K-states

(P2) K-states are accessible to higher cognitive operations.

- ▶ Anaphoric reference: Attested

(8) [Marxism's standing Hegel on his head]$_i$ may have reversed his idealism, but it$_i$ did not change the mode of operation of a conceptual system which remains collusively Eurocentric. (BNC)

(9) [Eeyore's viciously kicking Tigger]$_i$ was the outcome of their argument. This$_i$ indicates that they are not getting along at all well. (adapted from Asher 1993)

POSS-*ing* and temporal prepositions

(P3) K-states can be located in time.

- ▶ Temporal modifier is always contained in the VP-*ing*:
  [Clay's winning the game yesterday] (*this week) is a great news.

- ▶ *Take place* at (time)/*begin*/*end*: Not attested

- ▶ Temporal prepositions: Attested, despite Vendler's (1967) judgment:

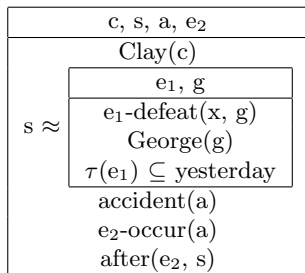 (10)   *Everything was quiet until his singing the Marseillaise.

  (11)   *The trouble started after his singing the Marseillaise.

  This is either assumed or not mentioned in most studies. I am only
  aware of Hamm & van Lambalgen (2002) whose interpretation of
  POSS-*ing* has temporal properties.

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Ontological properties of K-states

(P3) K-states can be located in time.

(12)   *After*: This concept met resistance in Tehran, particularly as Iraq underlined its position with another offensive just after Iran's accepting the principle of a cease-fire. (BNC)

(13)   *Before*: [...] before their being submitted for academic validation by the CNAA [...] (BNC)

(14)   *Between*: [...] delays incurred in the processing of such items between their leaving the Library and subsequently returning to it, will remain outwith the Library's control. (BNC)

(15)   *Prior to*: "I don't know whether Dersingham knew him prior to his appointing him." (BNC)

(16)   *Subsequent to*: I didn't see any past... I did see some past papers but it was subsequent to my setting these exam questions, right? (BNC)

POSS-*ing* and temporal prepositions

c, s, a, e_2
Clay(c)
$s \approx$ ...
accident(a)
e_2-occur(a)
after(e_2, s)

Inner box:

e_1, g
e_1-defeat(x, g)
George(g)
$\tau(e_1) \subseteq$ yesterday

An accident occurred after Clay's defeating George yesterday.

after(e_2, s) is interpreted as $e_2 > \tau(s)$.
$\tau(s)$ is a time point pragmatically relativized to e_1. (Huang 2021)

POSS-*ing* properties captured by K-states

Modelling POSS-*ing* as K-state helps to capture other properties of POSS-*ing*.

(P4) Incompatibility with manner predication.

▶ Manner modification is always contained in the VP-*ing*:
[Clay's winning the game (quickly)] was surprising.

▶ Manner predication: Not attested
*Clay's winning the game was quick/slow/sloppy/careful.

POSS-*ing* properties captured by K-states

(P5) The property in POSS-*ing* is intensional.

▶ Kim (1976) and Engelberg (2005) both point out that the property P in $[x, P, t]$ is intensional, which makes it hard to determine if two K-states are identical.

▶ POSS-*ing* is intensional and depends on its lexical content:

    (17)   Clay's winning the game was surprising.

    (18)   Clay's winning the game in two minutes by exploiting an unknown bug was surprising.

do not entail each other, even though there is only one winning event involved.

POSS-*ing* properties captured by K-states

(P6) The subject of POSS-*ing* behaves like a possessor in the discourse.

- ▶ There is disagreement as to whether POSS-*ing* is a possessive structure (Peters & Westerståhl 2013).

- ▶ K-states are property exemplifications in an object. The obligatoriness of a property bearer is reflected in the impossibility of expletive subjects in POSS-*ing*:

  (19) *Its raining outside/There's being a mess was disappointing.

- ▶ The subject of POSS-*ing* is given in the discourse.
  196 of 205 possessors of POSS-*ing* are given in the context, and none of the rest are completely new.
  Like possessors (Barker 2000), the subject of POSS-*ing* serves as an anchor to introduce the possessee (property) into the discourse.

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Conclusion

I attempted to show that interpreting POSS-*ing* as K-states:

▶ is viable, because POSS-*ing* shows all core properties of K-states

▶ is a way to interpret POSS-*ing* using basic elements

▶ takes into account some corpus data that were not considered in previous literature (experiments are needed to confirm the observations)

▶ better captures POSS-*ing*'s structural and discourse properties

Acknowledgements

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The (time) of POSS-*ing*

▶ [...] but the date of his leaving the office can not be so certainly fixed. (BNC)

▶ The fastest free mail order delivery service in the UK ensures your goods will normally be despatched within 24 hours of our receiving your order. (BNC)

▶ [...] what in fact happened was that the ENTIRE brood crammed themselves into it within a minute of my putting it in the tank. (BNC)

▶ [...] de Valois gave him at least one chance every year from the time of his joining the company. (BNC)

What would ACC-*ing* be?

In most analyses, ACC-*ing* and POSS-*ing* denote the same ontological object. ACC-*ing* is different from POSS-*ing* in that:

- ▶ Its subject is not a possessor, and therefore is more likely to be new.

- ▶ It has a richer sentence structure (sentential adverbials like *unfortunately*) than POSS-*ing*.

- ▶ It appears in a wider range of verbal structures, some of which do not accept POSS-*ing*. It is in general badly defined in the literature:
  George saw Clay winning the game.
  With(out) Clay winning the game, George got very happy/sad.

What would ACC-*ing* be?

ACC-*ing* is attested to be selected by temporal prepositions:

- *After*: Well, after them telling me how good Gary Kelly was, they said they had a Leeds youth team member in their squad. (BNC)

- *Before*: They get paper first before you sending them money. (BNC)

- *Between*: Just as we saw a few weeks ago Zaccheus was, er, between him being up the tree and hitting the ground, that man was converted. (BNC)

- *From*: We're less than twenty-four hours away from you beginning this inquiry, this inquest you have longed for. (COCA)

- *Prior to*: However, please do not hesitate to contact me if further clarification is needed prior to it being distributed. (BNC)

However, this is "atypical" in Present Day English (van de Pol 2018) and we cannot be sure that such structures are actually ACC-*ing*.

Indefinite possessor

It is possible that the possessor is indefinite and participants of the embedded event are definite.

(20)   Nowadays, that sort of conduct could lead to [a social worker's being asked to take an interest in the child]. (BNC)

$$
\begin{array}{|c|}
\hline
j,\ s,\ e_2,\ e_3 \\
\hline
\textcolor{gray}{\text{John}(j)} \\
... \\
s \approx
\begin{array}{|c|}
\hline
e_1,\ s_1,\ c \\
\hline
e_1\text{-battaii}(s_1,\ c) \\
\text{social-worker}(s_1) \\
\text{child}(c) \\
c = j \\
\hline
\end{array} \\
\text{sort-of-conduct}(e_2) \\
e_3\text{-lead-to}(e_2,\ s) \\
\hline
\end{array}
$$