A Non-Superlative Semantics for Ordinals

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Summary

The semantics of **ordinals** has been neglected until recently. Based on similarities with **superlatives** [1–4] put forward uniform treatments of the two classes of items. However, we observe that ordinals, unlike superlatives, do not give rise to **upstairs *de dicto* readings**. Assuming the movement theory of superlatives ([5–7]), we claim that ordinals must stay within the local DP, while superlatives may move out, and formulate the semantics of ordinals accordingly. As for their similarities, we suggest that they have to do with how **comparison classes** are determined.

Ordinals and Superlatives

1. Absolute/Comparative Ambiguity

Both superlatives and ordinals give rise to **absolute** and **comparative** readings ([1–3]).

(1) John gave Mary the **oldest** telescope.
  a. John gave Mary the telescope older than other telescopes. (Absolute)
  b. John gave Mary a telescope older than other people did. (Comparative)

(2) John gave Mary the **first** telescope.
  a. John gave Mary the telescope made before other telescopes. (Absolute)
  b. John gave Mary a telescope before other people did. (Comparative)

2. Focus Sensitivity

Comparative readings are **focus sensitive** for both superlatives and ordinals ([1]).

(3) a. John$_F$ gave Mary the **oldest** telescope.
  (John gave Mary a telescope older than other people did)
  b. John gave Mary$_F$ the **oldest** telescope.
  (John gave Mary a telescope older than he gave other people)

(4) a. John$_F$ gave Mary the **first** telescope.
  (John gave Mary a telescope before other people did)
  b. John gave Mary$_F$ the **first** telescope.
  (John gave Mary a telescope before he gave other people one)

3. Non-Modal Subject Infinitives (NMSIs)

Ordinals and superlatives both license **non-modal subject infinitival clauses** ([1,2,4]).

(5) a. (John bought) the **oldest** telescope to be made.
  b. (John bought) the **first** telescope to be made.

(6) (John bought) the telescope to be made.

A modal infinitival clause like (6) receives a 'futurate' interpretation (e.g. the telescope what is **going/planned** to be made). The sentences in (5) have non-futurate readings.

(NB: Both ordinals and superlatives are compatible with modal subject infinitival clauses too, so subject infinitival clauses are inherently ambiguous. Fortunately, modal interpretations can be pragmatically excluded in certain contexts, e.g. (12).)

[1] observes that non-modal subject infinitival clauses make both superlatives and ordinals focus *in*sensitive.

(7) a. John$_{(F)}$ gave Mary$_{(F)}$ the **oldest** telescope to be made.
  b. John$_{(F)}$ gave Mary$_{(F)}$ the **first** telescope to be made.

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Upstairs *De Dicto* Readings

[1–3] adapt the movement theory of superlatives ([5–7]) for ordinals. However, there is a crucial difference between superlatives and ordinals: ordinals don't give rise to **upstairs *de dicto* readings**.

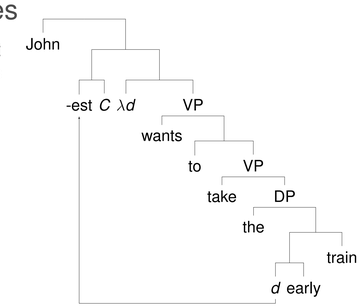
(8) Context: John, Bill and Fred are ignorant about one another.
  a. John wants to take a train between 3 pm and 4 pm.
  b. Bill wants to take a train between 5 pm and 6 pm.
  c. Fred wants to take a train between 7 pm and 8 pm.

(9) a. John wants to take the **earliest** train. **true** in (8)
  b. John wants to take the **first** train. **false or #** in (8)

Movement Theory of Superlatives

Movement theory postulates covert movement of *-est* to account for upstairs *de dicto* readings (see [9] for a different view).

(10) $[\![\text{-est}]\!]^w(C)(P_{\langle d,et\rangle})(x_e)$
is defined only if
$|C| > 1$ and
$\forall y \in C \exists d\colon P(d)(y) = \top$.
whenever defined, denotes $\top$ iff
$\exists d\colon P(d)(x) = \top$ and
$\forall y \in C\colon (x \neq y) \Rightarrow (P(d)(y) = \bot)$.



If ordinals move in the same manner, as suggested by [1–3], they should also give rise to upstairs *de dicto* readings, contrary to fact. Thus we'll pursue an ***in situ* analysis**.

Temporal Properties of NMSIs

4. NMSI Force Temporal Ordering

[4] points out that non-modal subject infinitival clauses determine the ordering.

(11) Context: There is a pile of five books. Some of the books were published in 2013.

Book A: published in May 2011
Book B: published in **August 2013**
Book C: published in December 2012
Book D: published in **March 2013**
Book E: published in **January 2013**

(12) a. (John read) the first book to be published in 2013. ⇒Book E
  b. (John read) the first book that was published in 2013. ⇒Book B or E

For (12a), the ordering must be the order of publication, i.e. the order in which the infinitival clause is true. For (12b) the ordering can be determined contextually.

5. NMSI and NP Must Temporally Overlap

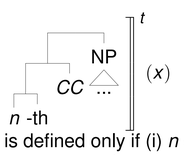
[1] observes that the NP and infinitival clause must temporally overlap, e.g. (13) implies that the person in question walked on the moon at the age of 80.

(13) I met the second 80 year old to walk on the moon.

(NB: [1,4] claim that NMSIs cannot temporally follow the matrix clause, but we do not find convincing evidence for this generalization, due largely to the ambiguity between modal and non-modal readings. Details are omitted here.)

Analysis

- Assumption 1: Ordinals decompose into a natural number (type *n*) and *-th* (cf. [2]).
  e.g. *first* = *one*+*-th*.
- Assumption 2: *-th* takes a natural number (type *n*), a C(omparison)C(lass) (type $\langle i, et\rangle$) and NP (type $\langle i, et\rangle$), and returns a function of type $\langle e, t\rangle$.
- Assumption 3: The NMSI is an overt realization of CC, and gets extraposed (cf. [2])
- Assumption 4: When there is no NMSI, a phonologically null pronominal *proCC* is in CC (or the NMSI is elided).

(14) $[\![$  $]\!]^t(x)$

Let $\mathcal{C} = \left\{ y \in D_e \;\middle|\; \exists t' \left[\begin{array}{l} [\![\text{NP}]\!]^{t'}(y) = \top \wedge \\ [\![\text{CC}]\!]^{t'}(y) = \top \end{array} \right] \right\}$

a. is defined only if (i) $n \leqslant |\mathcal{C}|$; and (ii) $x \in \mathcal{C}$.
b. whenever defined, denotes $\top$ iff $R(x) = n$ where $R : \mathcal{C} \to \mathbb{N}$ is:

$$R(y) = \left| \left\{ z \in \mathcal{C} \;\middle|\; \begin{array}{l} \iota t_z[[\![\text{NP}]\!]^{t_z}(z) = [\![\text{CC}]\!]^{t_z}(z) = \top] \\ \quad \preceq \iota t_y[[\![\text{NP}]\!]^{t_y}(y) = [\![\text{CC}]\!]^{t_y}(y) = \top] \end{array} \right\} \right|$$

(where $t \preceq t'$ iff t precedes t' on the temporal scale or $t = t'$).

Assuming that ordinals do not move out of the local DP (unlike superlatives), upstairs *de dicto* readings are not derived.

1. Absolute/Comparative Ambiguity

The absolute/comparative ambiguity is due to the value of *proCC* (cf. [8,9] for related ideas applied for superlatives).

- $[\![proCC]\!]$ = $[\![$to be made$]\!]$ ⇒ Absolute (2a)
- $[\![proCC]\!]$ = $[\![$to be given to Mary$]\!]$ ⇒ Comparative (2b)

2. Focus Sensitivity

The value of *proCC* is either determined from the context, or is identified with $\bigcup [\![\alpha]\!]_f$ for some constituent α, which can be a derived predicate (cf. [6,10–12]).

- For (4a), $\bigcup [\![\lambda x.$ John$_F$ gave Mary $x]\!]_f = \lambda t.\lambda x.$ someone gave Mary x at t
- For (4b), $\bigcup [\![\lambda x.$ John gave Mary$_F$ $x]\!]_f = \lambda t.\lambda x.$ John gave someone x at t

3-5. Properties of NMSI

- An overt NMSI serves as CC, and NP and CC fix the value of $\mathcal{C}$ and R. This also explains the focus insensitivity (7), and the rigid ordering (11)–(12).
- Consequence: focus determines the ordering, e.g. (4a) is false in (15).

(15) a. On August 1st, Bill gave Mary a telescope that was made in 1993.
  b. On August 2nd, John gave Mary a telescope that was made in 1880.
  c. On August 3rd, Steve gave Mary a telescope that was made in 2011.

- The semantics (14) requires that for each $x \in \mathcal{C}$, there be a (unique) time at which NP and CC are both true for x, explaining the temporal overlap requirement, (13).
  (for cases without uniqueness (14) can be type-shifted; details omitted)

Conclusions and Further Issues

- The absolute/comparative ambiguity does not motivate covert movement (contra [1,2]; with [8,9]), but the availability of upstairs *de dicto* readings does for superlatives.
- It is expected that our account of CC extends to superlatives and nominal *only*, both of which license NMSIs.

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