Before and after decomposing *first* and *last*

Johanna Alstott

Massachusetts Institute of Technology

NELS 54, 1/26/24

The status of *first* and *last*: An open question

- The literature on the semantics of ordinal numbers is small.
- Within this literature, conflicting portraits of *first* and *last*:
  1. *First* and *last* as ordinals (Herdan & Sharvit 2006; Bylinina et al. 2014); *first* as *one-th*
  2. *First* and *last* as superlatives (Barbiers 2007; Charnavel 2023)
     - Barbiers (2007): Dutch *eerst(e)* 'first' as a superlative
     - No decomposition proposed, argued for, and formalized
- The status of *first* and *last* as ordinals vs. superlatives and their internal composition remain open issues.

Main claim

First and *last* are superlatives, in particular the superlative forms of *before* and *after*.

Outline

Argument #1: Plurality (cf. Barbiers 2007)

- A difference between plural superlatives (Fitzgibbons et al. 2008) and plural ordinals (Alstott 2023):

(1) a. A and B were the earliest trains to arrive.
          $\not\rightarrow$ A and B arrived at the same time

     b. A and B were the eleventh trains to arrive.
          $\rightarrow$ A and B arrived at the same time

- *First* and *last* pattern like superlatives:

(2) A and B were the first/last trains to arrive.
     $\not\rightarrow$ A and B arrived at the same time.

Argument #2: Modifier choice (cf. Barbiers 2007)

- Superlatives can take the modifiers *very* and *absolute*, while ordinals cannot:

(3)   a.   The very/absolute best thing she told me was about you.
       b.   The (#very/absolute) third thing she told me was about you.

- *First* and *last* pattern like superlatives:

(4)   The very/absolute first/last thing she told me was about you.

Argument #3: Modal superlatives

- An ambiguity with superlatives and *possible* (Larson 2000; Schwarz 2005; Romero 2013):

(5) Sonya met the smartest possible spy.
   a. Modifier reading: Out of all people that are possibly spies, Sonya met the smartest one.
   b. Modal superlative reading: Sonya met as smart a spy as possible.

Argument #3: Modal superlatives

- The modal superlative ambiguity is present with *first* and *last* but not other ordinals:

(6) Sonya met the first/last possible spy.

    a. Modifier reading: Out of all people who are possibly spies, Sonya met the first/last one.

    b. Modal superlative reading: Sonya met a spy as early/late as possible.

(7) Sonya met the fourth possible spy.

    a. Modifier reading: Out of all people that are possibly spies, Sonya met the fourth one.

    b. #Modal superlative reading

Argument #4: Ordinal superlatives

- Superlatives can be modified by ordinals (Yee 2010; Alstott 2023); *first* and *last*, unlike other ordinals, can too.

(8)   Kendall caught the <u>third earliest</u> train.

(9)   #Kendall caught the <u>second third</u> train.

(10) A: I can't believe Charlotte was ranked <u>second (to) last</u>. I thought she did well!
      B: You're reading the list upside-down. She was ranked <u>second-to-first</u>!

Outline

Argument #1: Paraphrases

- Superlatives can be paraphrased as universally-quantified comparatives:

(11)   the highest mountain = the mountain that is higher than all others

- *First* and *last* are always paraphraseable as *before/after all others*:

(12)   a.   the last day of school = the day of school before all others
       b.   the last battle = the battle that is after all others

(13)   a.   the first natural number = the natural number that is/comes before all others
       b.   Mel puts her mental health last $\leftrightarrow$ Mel puts her mental health after all else

Argument #2: (Non-)Veridicality

- *Before* and *after* differ in the veridicality of their complement (Heinamäki 1974; Beaver & Condoravdi 2003, a.o.). *First* and *last* differ in a parallel way:

(14)   a. Mozart died before finishing the Requiem.

   b. Mozart died after finishing the Requiem.

(15)   Context: Amanda, Caroline, and Richard are taking turns climbing a tree.

   a. Caroline climbed the tree first. But no one else got a chance to go because the tree fell over.

   b. Caroline climbed the tree last. #But no one else got a chance to go because the tree fell over.

Argument #3: Asymmetric ambiguities

- Ambiguity with atelics present for *after*/*last* but not *before*/*first* (Anscombe 1964; Beaver & Condoravdi 2003; Rett 2020).

- Suppose Ben/Fred sang from 6pm-9pm and consider three scenarios for when Sal sang.

(16) a. Sal sang before Ben sang.
     (only true in Scen. A)

   b. Sal sang after Ben sang.
     (true in Scen. B and C)

(17) a. Sal sang first. (only true in Scen. A)

   b. Sal sang last.
     (true in Scen. B and C)

Ben and Fred
6pm   9pm

Sal,   Sal,   Sal,
Scen. A   Scen. B   Scen. C
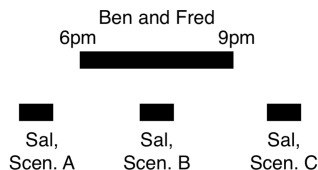
Argument #4: Morphology cross-linguistically

- The relation between *first* and *before* shows itself in the etymology of *first* (OED).
- In other languages, there is an even more obvious resemblance between the terms for *before* and *first* or the terms for *after* and *last*:

(18) **Italian**: *prima* 'before,' *prima/primo* 'first'

(19) a. **Mandarin**: *hoù* 'after,' *zuìhoù* 'last,' lit. 'most after'
  b. **Hebrew**: *aχrej* 'after,' *aχaron* 'last'

Outline

1. *First* and *last* are superlatives

2. *First* : *last* :: *before* : *after*

3. Formalizing the decomposition
   - Option A: Standard superlatives, non-standard *before*/*after*
   - Option B: Standard *before*/*after*, non-standard superlatives

Outline

1. *First* and *last* are superlatives

2. *First* : *last* :: *before* : *after*

3. Formalizing the decomposition
   - Option A: Standard superlatives, non-standard *before/after*
   - Option B: Standard *before/after*, non-standard superlatives

From standard superlatives to non-standard *before*/*after*

- Let's see if we can formalize the proposed decomposition using a standard semantics for superlatives (Heim 1999 and much subsequent work).
- According to this approach, superlative adjectives decompose into gradable predicate + *-est*.
- *before* and *after* are not gradable predicates, so we cannot say *first* = *before*+*-est* and *last* = *after*+*-est* on this theory.
- The only way to retain our main claim is to say that *before*/*first* and *after*/*last* are comparative-superlative pairs for the same positive.
- e.g. *before* = *fore*+*-er*, *first* = *fore*+*-est*

Issues

- While appealing at first, an analysis along these lines suffers from serious flaws.
- By treating *before* and *after* as comparatives with *-er*, this analysis makes a strong empirical prediction about *before* and *after* that is not borne out.
- Let's look at three cases where the prediction does not hold.

Differences between *before*/*after* and comparatives: #1

- Comparatives and *before* readily license NPIs in their complements, *after* does not (Linebarger 1987; Condoravdi 2010):

(20)   a. Caleb is taller than <u>anyone</u> else is.

    b. Caleb arrived before <u>anyone</u> else did.

    c. *Caleb arrived after <u>anyone</u> else did.

Differences between *before/after* and comparatives: #2

- Comparatives with universal quantifiers in their complements have truth-conditions paraphraseable with wide scope of the quantifier (von Stechow 1984, Schwarzschild & Wilkinson 2002, a.o.).
  After-sentences behave similarly.

(21) a. Caleb arrived earlier than every girl did.
        ↔ Every girl is s.t. Caleb arrived earlier than them.
    b. Caleb arrived after every girl did.
        ↔ Every girl is s.t. Caleb arrived after them.

- (22)'s truth-conditions are not paraphraseable with wide scope of the quantifier (Cleo Condoravdi, p.c.).

(22) Caleb arrived before every girl did.
      ↮ Every girl is s.t. Caleb arrived before them.

Differences between *before/after* and comparatives: #3

- There are categorial restrictions on the complements of *before/after* that are not present for comparatives (Penka & von Stechow 2011).

(23) a. Tom lived longer in Scotland than in the USA.
      b. *Tom lived in Scotland before/after in the USA.

(24) a. More cars drove fast than slowly.
      b. *John drove fast before/after slowly.

Bottom line

- While the above differences between *before*/*after* and comparatives do not falsify an analysis where *before*/*after* contain *-er*, they put enough pressure on the account that it is worthwhile to focus on an alternative for now.

- Ask me about another (potentially more serious) flaw with the *-er*-analysis of *before*/*after* in the Q&A!

Outline

# From standard *before*/*after* to non-standard superlatives

- Having argued against a version of my analysis that decomposes *before* and *after*, let's see what happens if we stick to the (standard) claim that *before*/*after* are not decomposeable.
- If *before*/*after* are not decomposeable, the only way to retain our main claim is to use an entry for *-est* that can be the sister of *before*/*after*.
- Heim (1999)-style entries for *-est*, which look for a gradable adjective as their sister, do not fit the bill.
- But there's an alternative approach to *-est* that does fit the bill.

The basic idea, informally

- Adopting Coppock's (2016) Bobaljik (2012)-inspired *-est*:

(25) $[\![\text{-est}]\!] = \lambda R_{\langle e,et \rangle}.\lambda C_{\langle e,t \rangle}.\lambda x.\ x \in C$ and $\forall y\ [[y \in C$ and $y \neq x] \rightarrow R(y)(x) = 1]$

- To compose *tallest*, our *-est* attaches to a relational element (*taller*) and expresses universal quantification (*taller than all others*).

- To compose *first*, our *-est* attaches to a different kind of relational element (a *before*-relation) and expresses universal quantification (*before all others*).

- *first = before + (25)* and *last = after + (25)*.

LF for *the first astronaut* + informal derivation
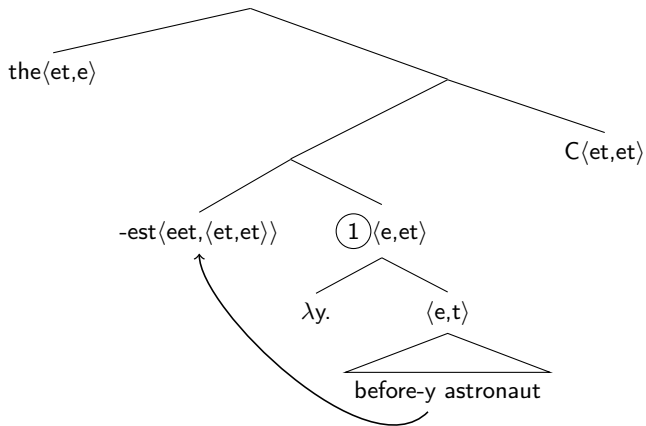
$\llbracket \circled{1} \rrbracket(y)(x) = 1$ iff $\exists t$: x was an astronaut at t and $t <$ the earliest time s.t. y was an astronaut

If you want to verify this at home...

- To make this analysis work, we do not use clause-conjoining entries for *before/after* but rather the $\langle e, \langle\langle s, et\rangle, \langle e, t\rangle\rangle\rangle$ entries proposed by Penka & von Stechow (2011) for cases like *Ben left after Al*.

(26) a. $[\![\text{before}^{phrasal}]\!] = \lambda y.\lambda R_{\langle s, et\rangle}.\lambda x.\ \exists t\ [R(t)(x) = 1\ \text{and}\ t <$
        $earliest([\lambda t'.\ R(t')(y) = 1])]$

     b. $[\![\text{after}^{phrasal}]\!] = \lambda y.\lambda R_{\langle s, et\rangle}.\lambda x.\ \exists t\ [R(t)(x) = 1\ \text{and}\ t >$
        $earliest([\lambda t'.\ R(t')(y) = 1])]$

(27) $earliest(p) = \iota t\ [t \in p \wedge \forall t' \in p\ [t \leq t']]$

Two steps in the derivation for *the first astronaut*

(28) $\llbracket \lambda y. \text{ before-y astronaut} \rrbracket =$
$\lambda y. \llbracket \text{before}^{phrasal} \rrbracket(y)(\llbracket \text{astronaut} \rrbracket_\phi) =$
$\lambda y.\lambda x. \exists t$ [x is an astronaut at t and t < *earliest*([$\lambda t'$. y is an astronaut at t'])]

(29) $\llbracket \text{first astronaut} \rrbracket(z) = 1$ iff
$\llbracket \text{-est} \rrbracket((28))(C)(z) = 1$ iff
$z \in C$ and $\forall y$ [[y $\in$ C and y $\neq$ z] $\rightarrow \llbracket \textcircled{1} \rrbracket(y)(x) = 1$]

References

Alstott, Johanna. 2023. Ordinal numbers: Not superlatives, but modifiers of superlatives. In *Semantics and Linguistic Theory (SALT) 33*.

Anscombe, Elizabeth. 1964. Before and after. *The Philosophical Review* 73(1):3-24.

Barbiers, Sjef. 2007. Indefinite numerals ONE and MANY and the cause of ordinal suppletion. *Lingua* 117:859-880.

Beaver, David & Cleo Condoravdi. 2003. A uniform analysis of *before* and *after*. In *Semantics and Linguistic Theory (SALT) 13*, 37-54.

Bobaljik, Jonathan. 2012. *Universals in comparative morphology: Suppletion, superlatives, and the structure of words.* MIT Press.

Bylinina, Lisa, Natalia Ivlieva, Alexander Podobryaev & Yasutada Sudo. 2014. A non-superlative semantics for ordinals and the syntax and semantics of comparison classes. Ms. Meertens Institut, Institut Jean-Nicod, Higher School of Economics, and UCL.

Charnavel, Isabelle. 2023. Appealing to superlative clauses. Ms. University of Geneva.

References

Condoravdi, Cleo. 2010. NPI licensing in temporal clauses. *Natural Language and Linguistic Theory* 28:877-910.

Coppock, Elizabeth. 2016. Superlative modifiers as modified superlatives. In *Semantics and Linguistic Theory (SALT) 26*, 1-15.

Fitzgibbons, Natalia, Yael Sharvit & Jon Gajewski. 2008. Plural superlatives and distributivity. In *Semantics and Linguistic Theory (SALT) 18*, 302-318.

Heim, Irene. 1999. Notes on superlatives. Ms. Massachusetts Institute of Technology.

Heinamäki, Orvokki. 1974. *Semantics of English temporal connectives*. PhD thesis, University of Indiana.

Herdan, Simona & Yael Sharvit. 2006. Definite and nondefinite superlatives and NPI licensing. *Syntax* 9(1):1-31.

Larson, Richard. 2000. ACD in AP? Paper presented at WCCFL 19.

Linebarger, Marcia. 1987. Negative polarity and grammatical representation. *Linguistics and Philosophy* 10(3):325-387.

References

Penka, Doris & Arnim von Stechow. 2011. Phrasal complements of *before* and *after*. In *Empirical issues in syntax and semantics 8*, 435-451.

Rett, Jessica. 2020. Eliminating EARLIEST: A general semantics for *before* and *after*. In *Sinn und Bedeutung (SuB) 24*.

Romero, Maribel. 2013. Modal superlatives: A compositional analysis. *Natural Language Semantics* 21:79-110.

Schwarz, Bernhard. Modal superlatives. 2005. In *Semantics and Linguistic Theory (SALT) 15*, 187-204.

Schwarzschild, Roger and Karina Wilkinson. 2002. Quantifiers in comparatives: A semantics of degree based on intervals. *Natural Language Semantics* 10:1-41.

von Stechow, Arnim. 1984. Comparing semantic theories of comparison. *Journal of Semantics* 3:1-77.

Yee, Charles. 2010. Building DRT lexical entries for superlatives and ordinal numbers. Ms. University of Stuttgart.