Quirks of Superlative *Most*

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Cognitive semantics and quantities kick-off workshop

University of Amsterdam

September 2017

Introducing *most*

Most is known to have two readings (Hackl, 2009):

(1) a. Mary read most of the books.
≈ Mary read more than half of the books ($> \frac{1}{2}$ **reading**)

b. Mary read the most books.
≈ Mary read more books than anybody else
(**Superlative reading**)

These two readings are morphologically distinguished in English: *most of the NP* vs. *the most NP*.

Introducing *most*

The corresponding German sentence is ambiguous (Hackl 2009, 69).

(2) Maria hat die meisten Bücher gelesen.
Maria has the most books read

a. Maria read more than half of the books. ($> \frac{1}{2}$ **reading**)

b. Maria read more books than anybody else (**Superlative reading**)

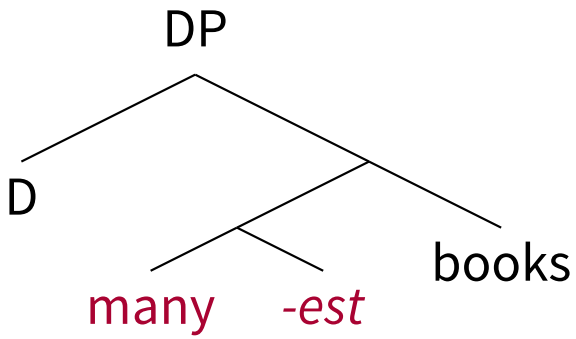
Introducing *most*

Two approaches to the formation of English *most*:

1. Most (of the) and the most are independent lexical items.
2. Most (of the) and the most are morphologically related forms:

☞ *Most* is decomposed into *many* + *-est*.
(Hackl, 2009; Gajewski, 2010; Kotek et al., 2011a,b, 2015; Krasikova, 2011; Solt, 2011; Pancheva and Tomaszewicz, 2012; Szabolcsi, 2012; Coppock and Josefson, 2015, a.o.)

(3)



Take-home message

English *most* is not a primitive but **a complex lexical item**, containing a superlative morpheme, much like its German counterpart *die meisten*.

However, unlike *die meisten*, English *most* is **sensitive to contextual restrictions** predicted by — but going beyond — its truth-conditions.

Roadmap

§1 Background: *most* as a superlatives

§2 Subject *most* has a superlative reading

§3 Quirks of subject *most*

§4 Consequences and conclusion

Roadmap

§1 **Background: *most* as a superlatives**

§2 Subject *most* has a superlative reading

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Background: superlatives

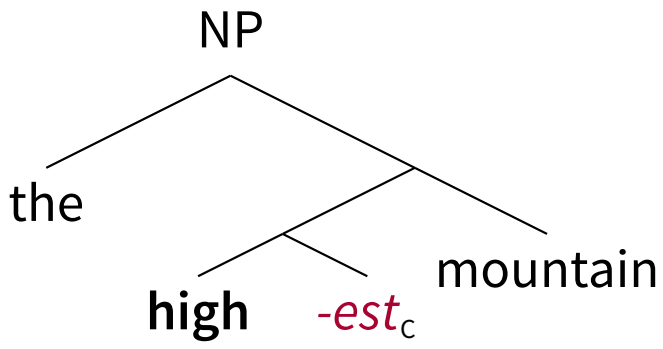
The **superlative** morpheme, *-est*:

- A modifier of **gradable adjectives**:
  - the ***tall****est* girl
  - the ***high****est* mountain
  - the ***clean****est* shirt
  - …
- Picks out the individual with the **maximal value** of the adjective G possessed by any member of the noun denotation in the context.

Background: superlatives

- A syntax: the **high***est* mountain:

(4)



- Heim's (1999) semantics for *-est*:

(5) $[\![\text{-est}]\!](C)(G)(x) \Leftrightarrow$
$\forall y \in C\,[x \neq y \rightarrow max\{d : G(d)(x)\} > max\{d : G(d)(y)\}]$

Background: superlatives

An ambiguity:

(6) Mary climbed the highest mountain.

a. Mary climbed a higher mountain than any other mountain [in the context].

→ comparing *mountains*

b. Mary climbed a higher mountain than any other person [in the context].

→ comparing *climbers*

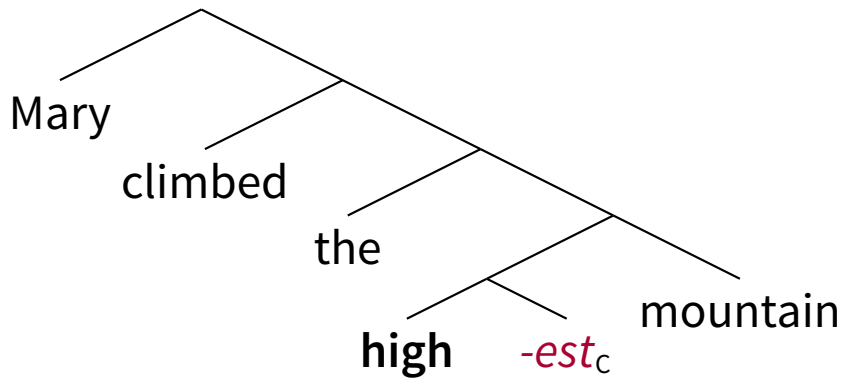
Background: superlatives

(6) Mary climbed the highest mountain.

A **structural ambiguity** (Heim, 1985, 1999; Szabolcsi, 1986; Hackl, 2009):

- **Comparing mountains:**
  - *-est* ranges over mountains

  $\Rightarrow$ *-est* picks the highest mountain in the context



- (6) asserts: Mary climbed the mountain picked by *-est*

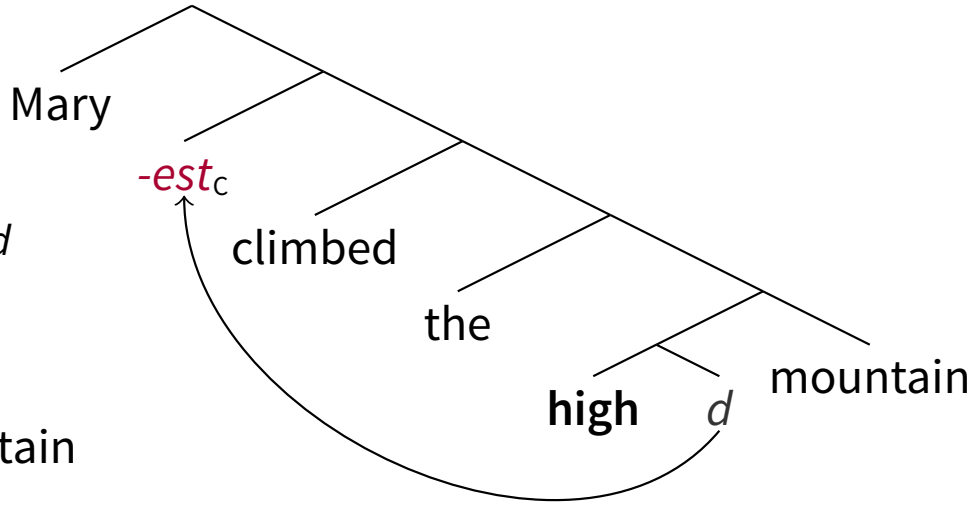
  $\rightarrow$ Mary climbed a higher mountain than any other mountain in the context.

Background: superlatives

(6) Mary climbed the highest mountain.

- **Comparing climbers:**
  - *-est* moves into matrix
    leaves behind a trace of type *d*
  - *-est* ranges over climbers

  $\Rightarrow$ *-est* picks the person that climbed the highest mountain in the context



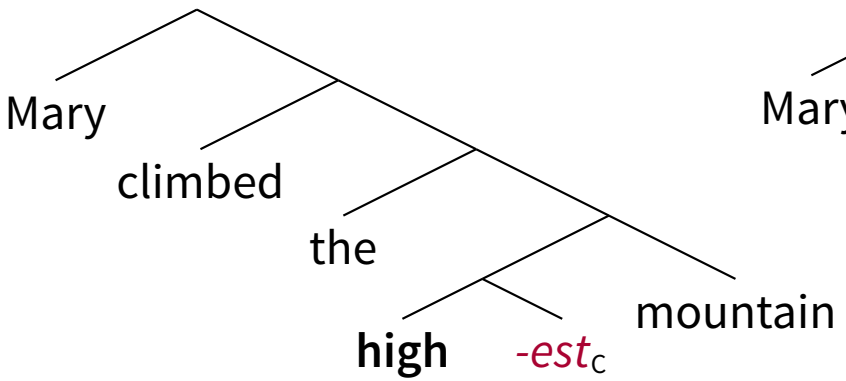
- (6) asserts: Mary is the person picked by *-est*$_C$
  $\rightarrow$ Mary climbed a higher mountain than any other person in the context.

Background: superlatives

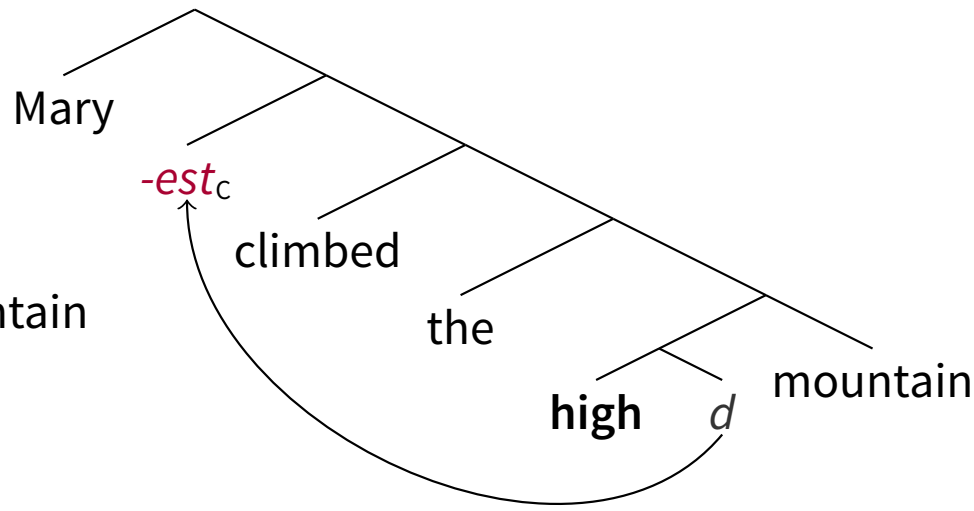
Side by side comparison:

"Mary climbed a mountain higher than…

…any other mountain"



…any other person"



Most again

Like *highest* and other superlatives, *most* exhibits an ambiguity.

(7) **Comparing mountains** ***proportional***

a. Mary climbed *most* of the mountains

b. ≈ Mary climbed more than half of the mountains

(8) **Comparing climbers** ***superlative***

a. Mary climbed the *most* mountains

b. ≈ Mary climbed more mountains than anyone else

- Disambiguated by morphology in English (bare *most* vs. *the most*)
- Hence traditionally thought of as two separate lexical items (Barwise and Cooper, 1981; Lidz et al., 2011, a.o.)

Most as a superlative: *many-est*

An alternative: ***most* is not a lexical primitive**. Instead: *most* = *many* + *-est*
(Hackl, 2009; Kotek et al., 2011a,b, 2015; Krasikova, 2011; Szabolcsi, 2012)

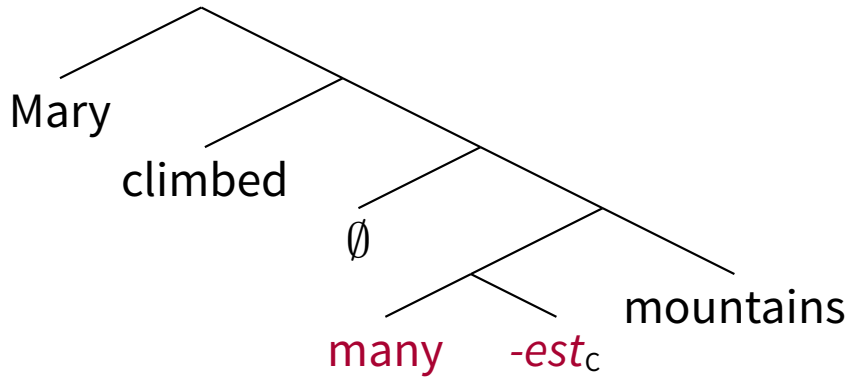
- *many* is a gradable predicate that counts elements of a certain kind
- *-est* picks out the maximal element in some set:
  - the highest mountain
  - the most mountains

Most as a superlative: *many-est*

(7a) Mary climbed most of the mountains.

(Suppose that there are 5 mountains: m_1, m_2, m_3, m_4, m_5, and that
Mary climbed 3 of them: m_1, m_2, m_3.)

- **Comparing mountains:**
  - *-est* ranges over mountains.
  - *many* counts pluralities of mountains in the context



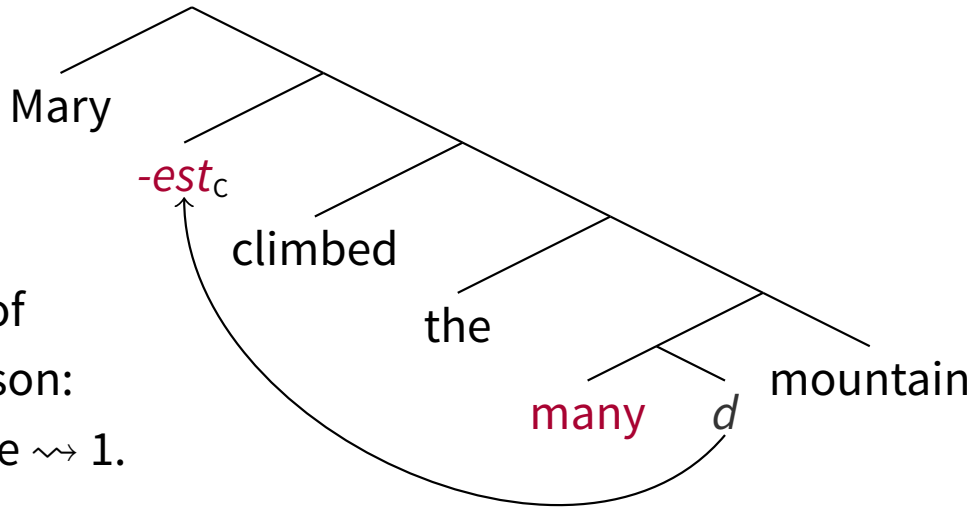
⇒ The plurality of mountains that Mary climbed is greater in number than any non-overlapping plurality (=the mtns Mary didn't climb).

- $|m_1 \oplus m_2 \oplus m_3| > |m_4 \oplus m_5|$

Most as a superlative: *many-est*

(8a) Mary climbed the most mountains.
(Suppose that Mary climbed 3 mountains, Lisa climbed 2 mountains, and Charlie climbed 1 mountain.)

- **Comparing climbers:**
  - *-est* moves into matrix, ranges over climbers.
  - *many* counts the number of mtns climbed by each person: Mary $\rightsquigarrow$ 3; Lisa $\rightsquigarrow$ 2; Charlie $\rightsquigarrow$ 1.



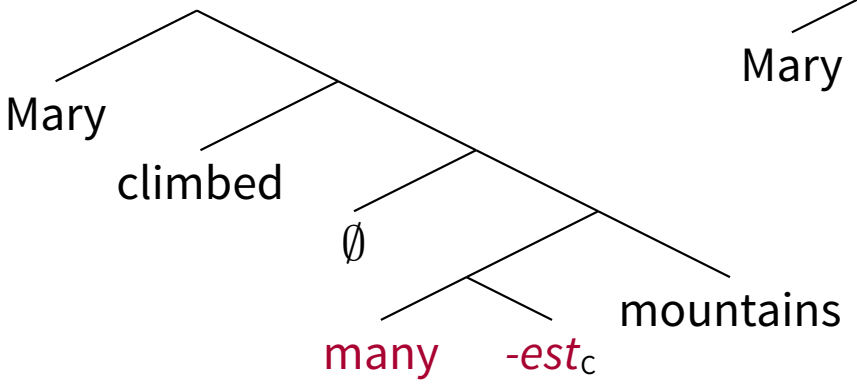
$\Rightarrow$ The number of mountains that Mary climbed is greater than the number of mountains that anyone else climbed.

Most as a superlative: *many-est*

Side by side comparison:

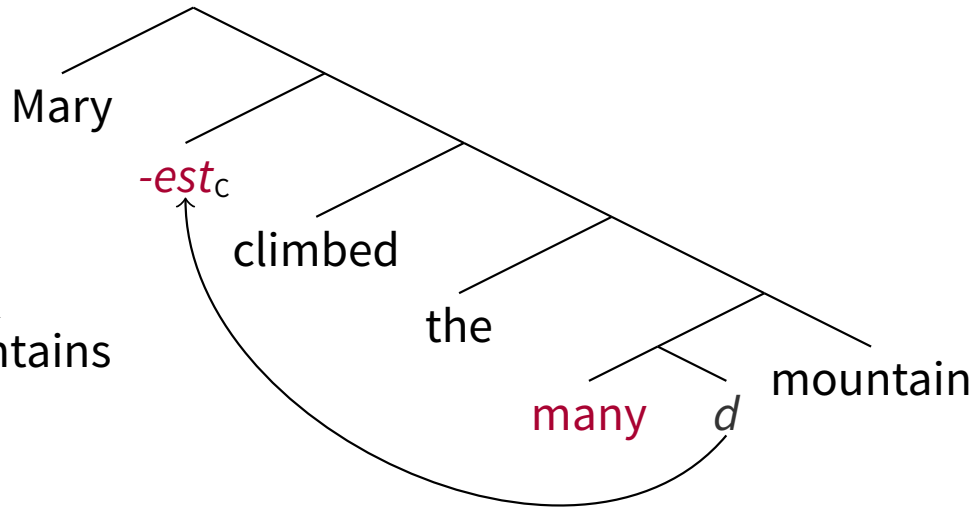
"Mary climbed more mountains than…

…she didn't"



→ **proportional**

…anyone else"



→ **superlative**

☞ **The same components: *many, -est* used in both readings!**

Roadmap

§1 Background: *most* and superlatives

§2 **Subject *most* has a superlative reading**

- Experiment 1: Covered Box
- Experiment 2: Ratings by Color
- Consequences for the theory of *most*

§3 Quirks of subject *most*

§4 Consequences and conclusion

Most in subject position

Additional support for the decompositional view of *most* comes from the behavior of *most* in subject position.

(9) a. ✓ Most of the students (in the class) ate cookies.

b. % The most students (in the class) ate cookies.

☞ We'll show: For some speakers, bare *most* takes on a superlative reading in subject position.

Two experiments

- We are interested in asking whether *most* is ambiguous:

(10) Most of the dots are blue.

a. There are more blue dots than non-blue dots ***proportional***

b. There are more blue dots than dots of each of the other colors (individually) ***superlative***

☞ An experimental manipulation:
compare *most* to the determiner *more than half*.

- *More than half* has just one of the two possible readings of *most*.

(11) More than half of the dots are blue. ***proportional***

Two experiments

Most of the dots are blue

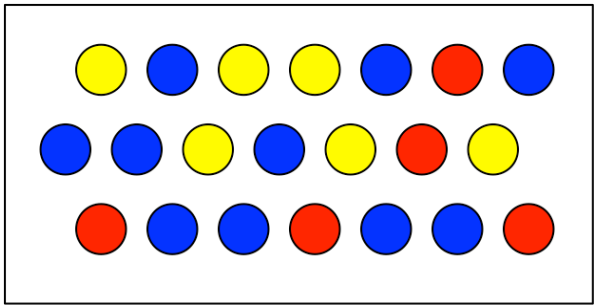


Figure 1

The two possible readings of *most*:

- **Proportional reading:**
  There are more blue dots than non-blue dots
  ≈ More than half of the dots are blue
  Blue: 10; non-blue: 11 — ***false* in this case!**
- **Superlative reading:**
  There are more blue dots than dots of any other color
  Blue: 10; yellow: 6; red: 5 — ***true* in this case!**

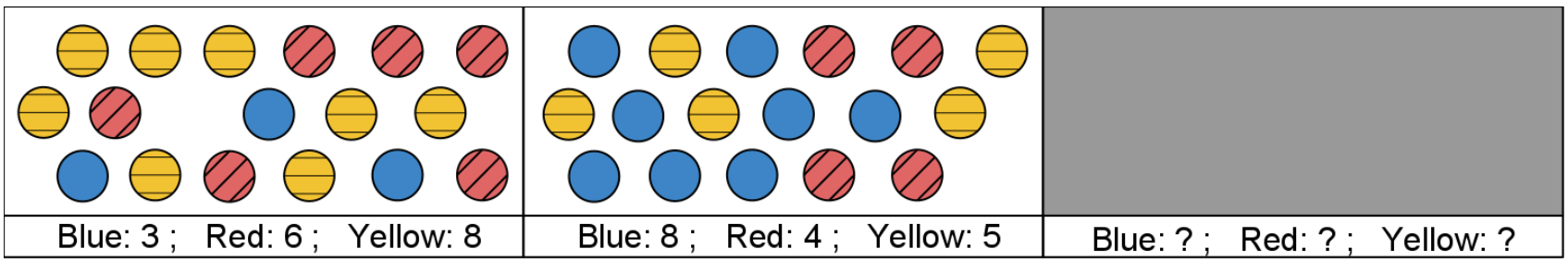
I will call pictures as in Figure 1 **'superlative pictures.'**

Experiment 1: Covered picture

- Huang et al. (2013): Sentence picture matching task
- The picture that supports the dominant reading is masked.

(12) Most of the dots are blue *target*

(13) More than half of the dots are blue *control*

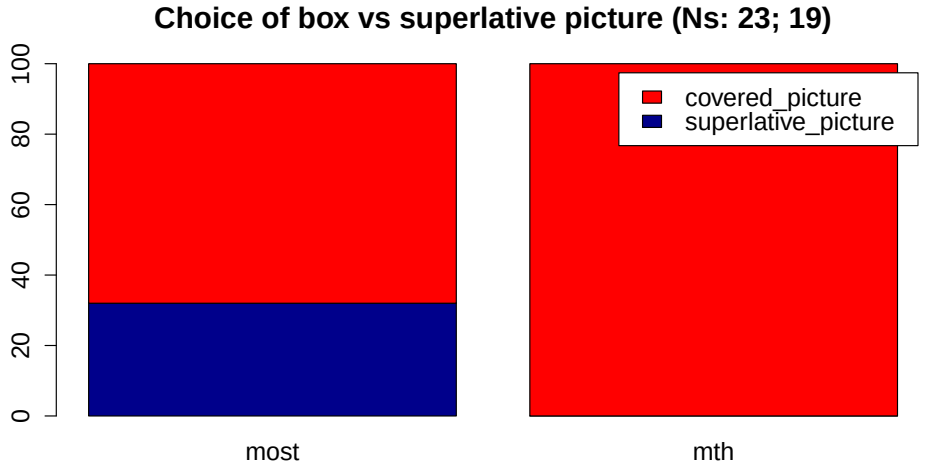


(Kotek, Sudo, Howard, and Hackl, 2011a)

Experiment 1: Results

- Online study run on Amazon's Mechanical Turk (42 participants)
- Superlative picture chosen **32%** of the time with *most*; never with *more than half*.
  - Wilcoxon signed rank test (W=172.5, Z=2.063, p<0.05).

- Choice of the superlative picture is subject to speaker variation: only 13 out of 23 subjects chose the superlative picture at least once.



(Kotek, Sudo, Howard, and Hackl, 2011a)

Experiment 1: Discussion

- The superlative picture was chosen only with *most*. Hence, this is not simply general experimental noise.

☞ Some speakers exhibit behavior ***compatible* with a superlative interpretation** for subject *most*.

- The superlative reading is still less preferred than the proportional reading.

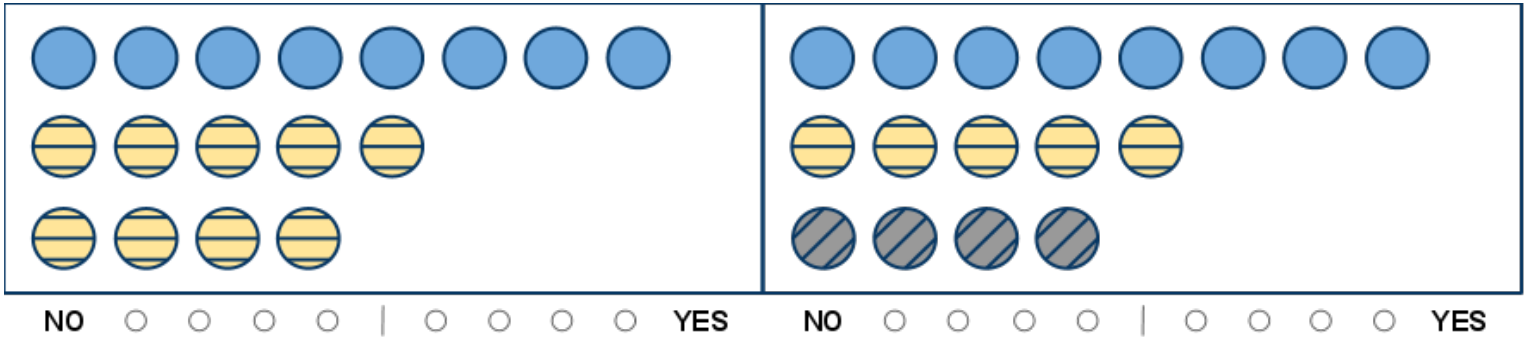
Experiment 2: Ratings by Color

Does *most* show sensitivity to the number of colors?

- Superlative reading predicts a 'yes' answer for *most*.
- *More than half* should not show a similar sensitivity.

(12) Most of the dots are blue *target*

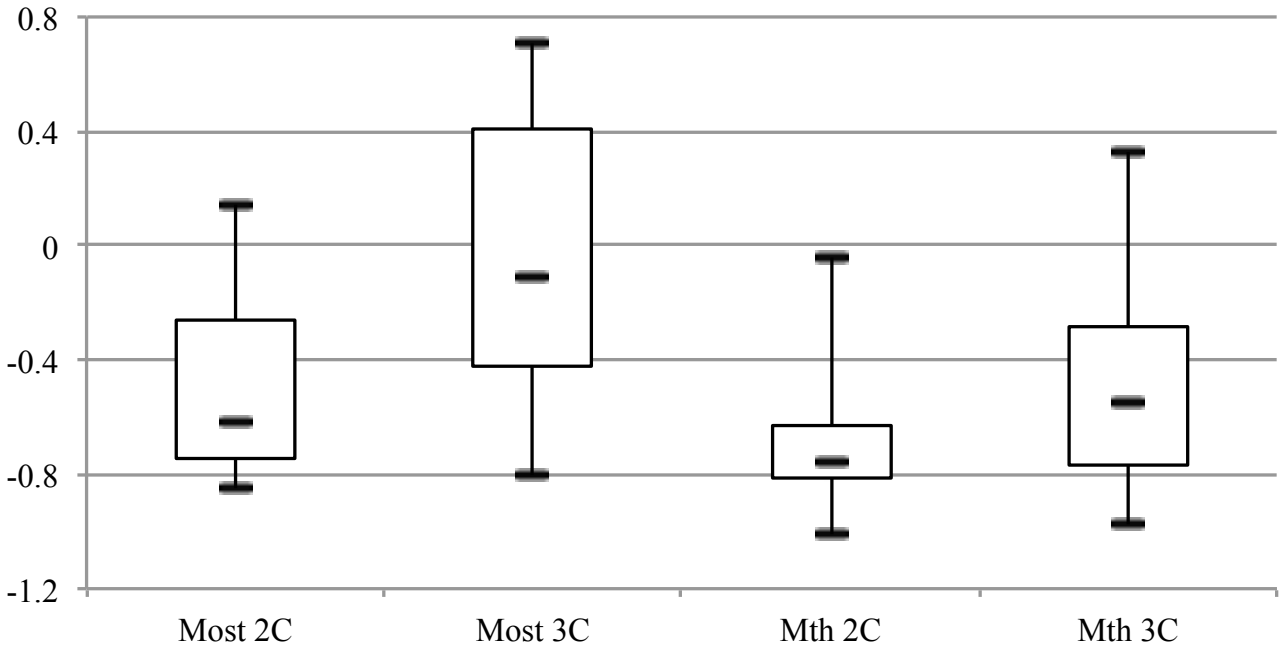
(13) More than half of the dots are blue *control*



(Kotek, Sudo, Howard, and Hackl, 2011a)

Experiment 2: Results

- Online study run on Amazon's Mechanical Turk (34 participants)
- **Interaction**: 3-Color pictures rated higher with *most* than *more than half* compared to respective 2-Color baselines.
  - Linear mixed effect model, Log likelihood tests ($\chi^2(2)=22.419$, $p<0.001$).



(Kotek, Sudo, Howard, and Hackl, 2011a)

Consequences for the theory of *most*

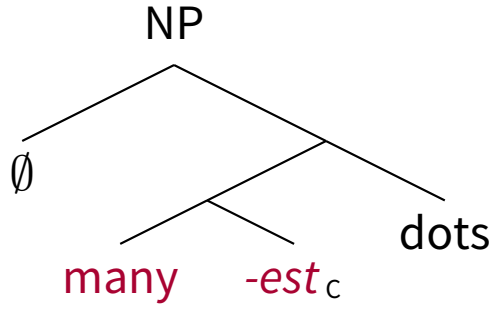
Proposal under the decompositional view of *most* as *many-est*:

- To derive superlative *most* in subject position, **rely heavily on pragmatics**.

(14) ⟦Most of the dots are blue⟧ is *true* iff
$\exists X\,[\text{Dots}(X) \,\&\, \text{Blue}(X) \,\&\, \forall Y \in C[Y \perp X \Rightarrow |X| > |Y|]]$

$\Rightarrow$ iff there is a plurality of blue dots X, such that every other plurality Y in the context C is less numerous than X.

- **C = Dots $\Rightarrow$ proportional**
  - Provided by the grammar
- **C = Blue/Red/Yellow dots $\Rightarrow$ superlative**
  - Supported by the context
  - (constrained, dispreferred, subject to variation)



(Kotek et al., 2011a)

Roadmap

§1 Background: *most* and superlatives

§2 Subject *most* has a superlative reading

§3 **Quirks of subject *most***

- 'Fragile' *most*
- 'Partitioning' *most*

§4 Consequences and conclusion

Context sensitivity

Unlike in German, and unlike *most* in object position: English subject *most* is derived through a manipulation of the **context parameter**:

(14) ⟦Most of the dots are blue⟧ is *true* if and only if
there is a plurality of blue dots X, such that every other plurality Y **in the context C** is less numerous than X.

Prediction: context manipulation should affect subject *most*, but not 'regular' superlatives, including *most* in object position and in German.

‘Fragile’ *most*

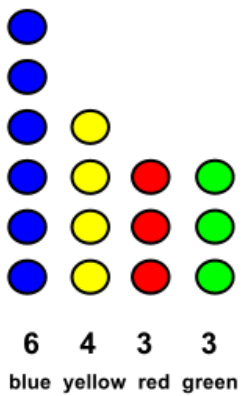
Most in subject position is sensitive to the **number of colors** in a visual scene, as well as **their makeup**.

The superlative reading in subject position ***‘breaks’*** in certain configurations, unlike a ‘regular’ superlative reading.

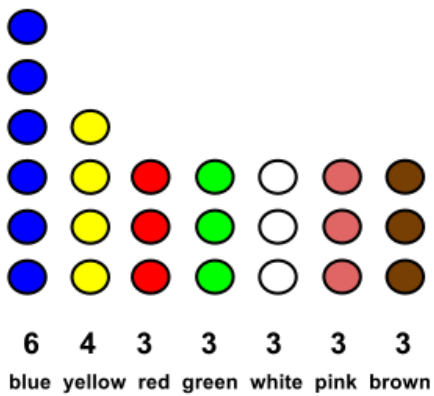
(15) Mary painted the most dots blue.

(16) Most of the dots are blue.

(a)



(b)



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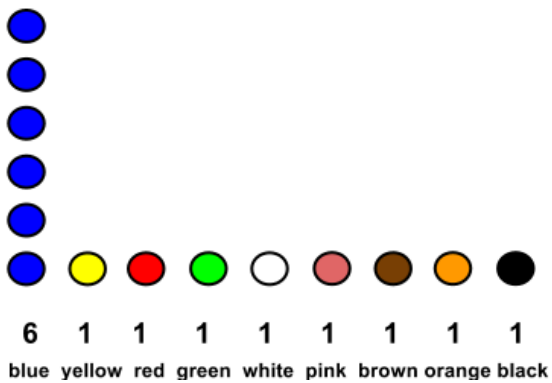


‘Fragile’ *most*

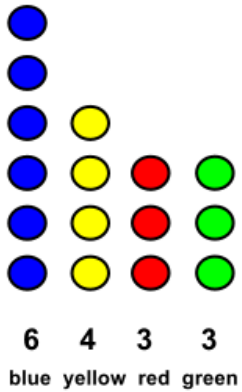
- *Most* in object position (+ German) is **true** in all three contexts.
- *Most* in subject position is judged **true** in contexts (a) and (c) but speakers struggle with (b) and judge expansions of (b) as **false**.

☞ Unexpected based on truth conditions for *most*.

(15) Mary painted the most dots blue.

(16) Most of the dots are blue.

(a)



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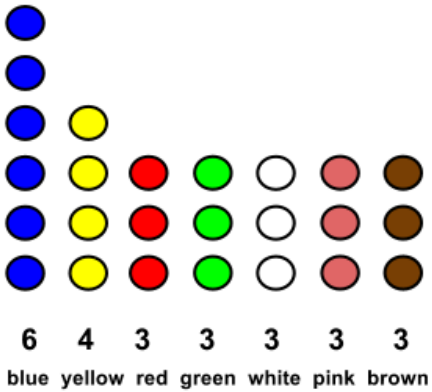
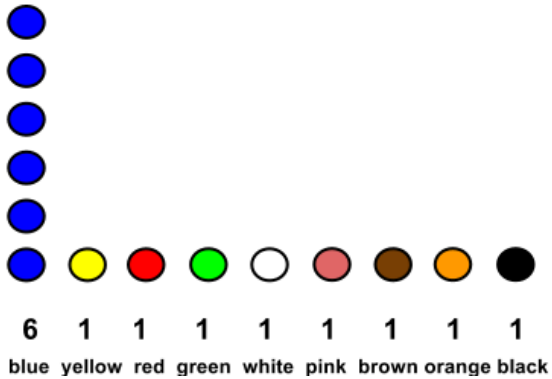


(c)



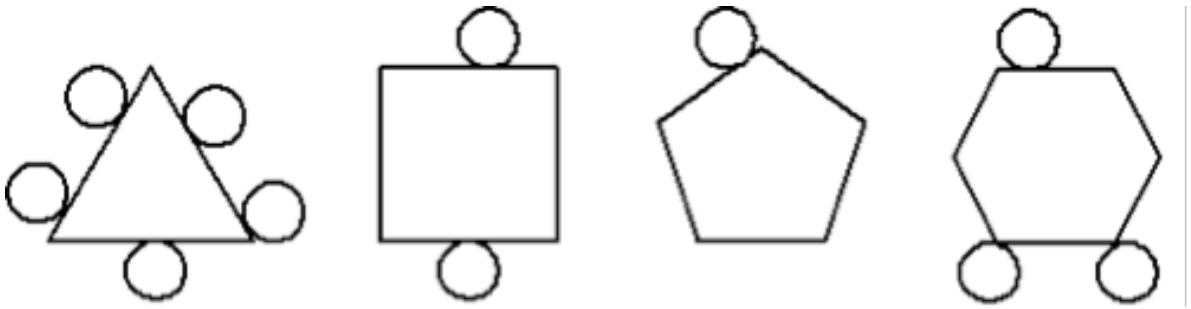
‘Partitioning’ *most*

Overt movement makes *the most* in subject position grammatical for all speakers (cf. Farkas and É Kiss, 2000)

(17) a. (%) The most circles are touching the triangle

b. Which figure are the most circles touching?

- Only the superlative reading is available



(Kotek, Sudo, Howard, and Hackl, 2011b)

‘Partitioning’ *most*

Two kinds of superlative reading for both bare *most* and *the most*:

- Some speakers who accept (18) in Fig 7 judge it infelicitous in Fig 8.
- No such effect for object *most*, e.g. (19).

(18) Most of the circles/The most circles are touching the triangle

(19) The triangle is touching the most circles

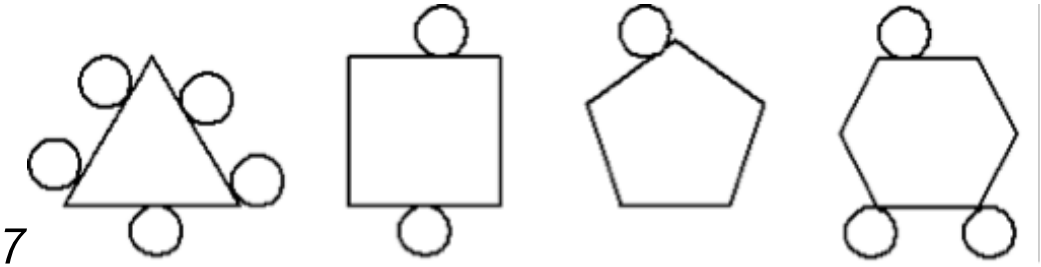


Figure 7

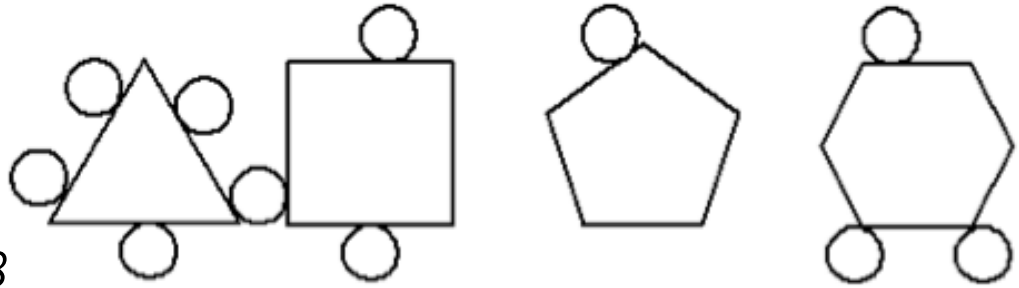


Figure 8

Roadmap

§1 Background: *most* as a superlatives

§2 Subject *most* has a superlative reading

§3 Quirks of subject *most*

§4 **Consequences and conclusion**

Quirks of superlative *most*

Most in subject position exhibits a **dispreferred superlative reading**.

- All speakers have access to a *proportional* ($> \frac{1}{2}$) reading;
- Some speakers in addition have access to a latent *superlative* reading.

☞ *Most* in subject position exhibits **hyper-sensitivity to context**.

The superlative reading of *most* in subject position is **substantively different** than the superlative reading of *most* in object position.

☞ Care must be taken when arguing that *most* is a superlative.

Thank you! Questions?

I would like to thank Danny Fox, Irene Heim, David Pesetsky, Michael Yoshitaka Erlewine, Edwin Howard, Michelle Fullwood, and audiences at Yale, McGill, MIT, CUNY 24, WCCFL 29, SALT 21&22, CLS 47&48, ESSLLI 23, and the Cognitive Science Society for comments and discussion.
Parts of this work were supported by NSF grant No. 0642748.
Special thanks to my co-authors Martin Hackl and Yasutada Sudo.

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