The lexical semantics of *much*: conversion from intervals to degrees

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- Degree modifier *much*: an illustration of the lexical semantics of *much* in general.
- What accounts for contrasts in felicity like the following?
  
  (1) a. a much read book  
      b. # a much written book

- Main claim:
  - *much* measures the degree to which a property holds of subparts of an object. This explains contrasts like (1).
- Data:
  - The interpretation of deverbal adjectives modified by “degree-modifier” *much*.

1 The distribution of degree-modifier *much*

1.1 Kennedy and McNally (2005)

- Gradable adjective meanings are of type *(d, (e, t))*, their domains define scales:
  - Lower-closed: [0, 1]  
  - Upper-closed: (0, 1]  
  - Fully closed: [0, 1]  
  - Open: (0, 1)

- Degree-modifier *much* is restricted to minimum-standard adjectives (same as adjectives with lower-closed scales (Kennedy, 2007)).

2 Analysis: *much* converts properties into measure functions

2.1 Proposal

- I propose for *much* the denotation in (6).

  (6) $[[\text{much}]] = \lambda P \in (\alpha, \beta) \lambda \text{LENGTH} \left( \{ d \mid \exists e' : e' \leq e \land P(e') \land \mu(e') = d \} \right)$

  - LENGTH is a (partial) function from convex intervals of degrees to their lengths.
    
    * $\text{LENGTH} = \{ \langle \alpha, \beta \rangle \in P(D_3) \times D_3 \mid \forall d \forall d' \forall d'' [d \in \alpha \land d'' \in \alpha \land d < d' < d''] \rightarrow d' \in \alpha \land \beta = \max(\alpha) - \min(\alpha) \land \beta > 0 \}$
    
    * The first conjunct ensures that it is only defined on convex sets.
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* The output is the greatest degree in the set minus the least degree—intuitively the set’s “size” or “length”.
* The last conjunct ensures that its range constitutes an open scale.
  - The interpretation of *much* in its bare form is determined contextually (Kennedy, 2007).

- µ...
  - A contextually-determined homomorphism (w.r.t. $\vee_{D_4}$ and +) from $D_4$ to $D_d$.
  - It must be monotonic (Schwarzschild, 2002, 2006). *much* food: in terms of weight or volume; not in terms of temperature.

- Intuitively, *much* takes a property of events and returns a measure function that measures the degree to which the property holds of subevents.

- **Deverbal adjective formation:**
  - Denotation of the stativizer *-ed* from Baglini (2012).

\[
\frac{AP}{AP} \lambda d_4 \lambda x_e \exists e_{d} [P(x)(e) = d]
\]

- A derivation is illustrated in (8) for *much criticized*, as in (2a) above.

\[
(8) \quad \lambda x_e \lambda e_{d}. {\text{length}}((d_4 | \exists e' \leq e \wedge \text{criticize'}(x(e') \wedge p(e') = d)) = d)
\]

- **What does (8) mean?**
  - A gradable property measuring criticism events associated with an object.
  - Some homomorphisms µ:
    - Mapping to duration: ‘criticized for a long time’.
    - Mapping to cardinality (if the event is a plurality (Link, 1983)): ‘criticized many times’.
    - Mapping to cardinality of agent: ‘criticized by many people’.

2.2 Two other types of derived scales: some incremental theme verbs and verbs without a source of scalarity

- **How are deverbal adjective scales derived, according to Kennedy and McNally (2005)?** Event structure of verb → Scalar structure of adjective.
  - Minimum-standard deverbal adjectives (e.g., *criticized*): derived from atelic verbs.
  - Fully-closed-scale deverbal adjectives (e.g., *written*): derived from incremental theme verbs.
  - Infelicitous with *much*: *much written*.

2.2.1 Certain incremental theme verbs

- However, not all deverbal adjectives derived from incremental theme verbs are felicitous with modification by *much*. Check out (9). (My underlining.)

\[
(9) \quad a \ {completely, fully, 100%, half} copied cassette
\]

- I remember Phil playing me a Paco del Gastor bulería track off a copied cassette and my hair kind of stood on end, it was such a shock, the incredible way he played.

\[
(9) \quad b \ {completely, fully, 100%, half} read copy
\]

- The composition, commissioned by Olson’s Voices of Mel Olson chorale, has become a much-performed favourite over the years.

\[
(9) \quad c \ {completely, fully, 100%, half} traversed boulevard
\]

- The composition, commissioned by Olson’s Voices of Mel Olson chorale, has become a much-performed favourite over the years.

\[
(9) \quad d \ {completely, fully, 100%, half} photographed place
\]

- These adjectives can be diagnosed as making use of fully-closed scales, despite felicitous modification by *much*.

\[
(10) \quad a \ {completely, fully, 100%, half} read copy
\]

- These adjectives can be diagnosed as making use of fully-closed scales, despite felicitous modification by *much*.
What’s the difference? These types of events can be iterated.

Possibly, such adjectives ambiguously make use of one of two scales:

- Based on the part structure of the theme.
  - This is what fully-closed-scale modifiers target (see (10)).
- Based on part structure of plural event, deriving upper-open scales.
  - This is what much targets (see (9)).

But, the noun phrases in (11) are unambiguous. (slightly is, in principle, compatible with upper-open scales.)

(11) a. a slightly read copy
    (√small number of pages, #small number of readers)
b. a slightly copied cassette
    (√small portion of cassette, #small number of copies)
c. a slightly traversed boulevard
    (√small number of feet, #small number of travelers)
d. a slightly photographed place
    (√small number of photographs, #small number of photographers)
e. a slightly performed favorite
    (√small portion of piece, #small number of performers/shows)

Open question: what is the source of scalarity in (9), given that it isn’t obviously available from the adjective itself (e.g., (11))?

2.2.2 Verbs without a source of scalarity

That verbs which seem to lack a source of scalarity result in poor stative passives is noted in Baglini (2012).

(12) a. # the (slightly, partly, ...) considered topic
b. # the (slightly, partly, ...) seen interview
c. # the (slightly, partly, ...) noticed phenomenon
d. # the (slightly, partly, ...) reached for lipstick
e. # the (slightly, partly, ...) raised analogy

These verbs lack lexical scales.

(13) a. The soup cooled [slightly, halfway, completely].

b. He washed the dishes [slightly, halfway, completely].
c. # They considered the topic [slightly, halfway, completely].
   (non-partitive reading)
d. # She saw the dot [slightly, halfway, completely].
e. # They noticed the dot [slightly, halfway, completely].
f. # He reached for the lipstick [slightly, halfway, completely].
g. # She raised the analogy [slightly, halfway, completely].

But, they become fully acceptable as stative passives with modification by much. (My underlining.)

(14) a. A different approach to the much considered topic of women and Islam.
    (http://www.linahashim.com/?page_id=949)
b. And, of course, there’s the much-seen FoxNews.com interview, ...
    (http://www.publishersweekly.com/pw/by-topic/industry-news/bookselling/article/58662-
    this-week-s-bestsellers-august-12-2013.html)
c. ...thereby contributing greatly to the much noticed global warming phenomenon.
d. I think it’s going to be a much reached for lipstick on summer days
    for sure xo
    (http://www.tattooedtealady.com/2013/04/my-first-chanel-lipstick.html)
e. No different to the much raised analogy of leasing vs owning a car.
    (http://forums.adobe.com/message/5364775)

The adjectives in (14) inherently lack the scale with which they are interpreted, as shown by the unacceptability shown in (12) and (13).

The adjectives in (9) inherently lack the scale with which they are interpreted, as shown by the unavailability of this interpretation in (11).

Where are these interpretations coming from? much.

2.2.3 read vs. written

Following the derivation in (8), much read and #much written would have the truth conditions in (15).

1 Although there are arguments that the thematic relation of incremental theme verbs is contributed by the theme itself (Rappaport Hovav, 2008; Bochnak, 2010, To appear; Kennedy, 2012), I assume here that it is part of the meaning of the verb to simplify the illustration.
2.2.4 Intervals?

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• See Wellwood et al. (2012) and Wellwood (2012) for a similar proposal cast in terms representing gradable properties as relations.

– Yes.

• Predictions of the interval account: choices for μ

1 See Gawron (2007), who takes the unacceptability of modification of incremental theme VPs by more (“write the book more”) as evidence for the VP lacking a degree argument.

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3 In contrast, the first two interpretations satisfy convexity w.r.t. the cardinality function, though see Fox and Hackl (2006), who argue against this assumption.
References


Appendix

A Other uses of much

• Instead of what was proposed above, the denotation of much could be generalized.

  \[ [\text{much}] = \lambda P. \lambda a. \lambda x. \text{LENGTH}(\{d \mid \exists y: y \leq x \land P(y) \land \mu(y) = d\}) \]

• much food
B Semantically vacuous much

- This section argues against analyses of much assuming it is semantically vacuous, there only to satisfy selectional requirements. See, for example, Corver (1997); Neeleman et al. (2004); Solt (2010, 2013).

- Neeleman et al. (2004), in particular, argue that much-support with non-adjectival predicates results from the selectional requirements of their ‘Class I’ degree modifiers, as (20a)-(c) illustrate. (d) shows that their ‘Class II’ modifier somewhat doesn’t allow much-support. Other Class II modifiers are, e.g., a little, a bit, and deadjectival adverbs like incredibly.

(20)  a. John is fond of Sue. Maybe he is even [too, very] *(much) so.
     b. Mike is [too, very] *(much) taller than Sam.
     c. John likes Sue [too, very] *(much).
     d. John is likes Sue somewhat *(much).

- Two domains of data cast doubt on this explanation, specifically with respect to the degree modifier very.

B1 Fragment answers

- The following question-answer paradigm appears to track the classification of degree modifiers into selecting heads and adjuncts in Neeleman et al. (2004).

(21)  A: How tall is John? B:
     a. Very, A little, A bit, Incredibly.
     b. Too, So, This, That *(tall).

- Except for very, the degree words in (21) fall into Class II via the diagnostic involving much-support.

- Class I degree words (as diagnosed by much-support), except for very, are poor fragment answers.

- This contrast receives a straightforward explanation if:

- very is a Class II (adjunct) degree modifier, and
- we adopt Merchant (2004)’s analysis of fragment answers.

(22)  FP
    F
    CP
    C’< IP >
    t’
    C
    t
    F
    very
    F’
    CP
    C’
    t’
    C
    t
    F
    C
    t’
    C
    t
    F
    C
    t’
    C
    t

- Movement is phrasal: licit with phrasal degree modifiers (21a), but not selecting heads (2b), unless the occur with the adjective.4

- That movement is the source of the explanation for this contrast is supported by its sensitivity to island effects.

(23)  A: Do you wonder who is tall? B:
     b. * Somewhat.
     c. * A bit.
     d. * So tall.

- And to Binding Principles A and B.5

(24)  A: How proud does John think Bill is? B:
     a. Too proud of himself. (himself = Bill; *= John)
     b. Too proud of him. (him = John; *=Bill)

B2 A constraint on prenominal modification

- Many studies have addressed the following phenomenon (Bresnan, 1973; Bowers, 1975, 1987; Hendrick, 1990; Kennedy and Merchant, 2000; Matushansky, 2002, a.o.).

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4An ellipsis account, in which very simply licenses ellipsis of its adjectival complement, is not possible without restricting it to environments involving fragment answers.

5See Merchant (2004) for a range of tests diagnosing movement.
(25)  a. Sam drives [too, so, this, that] cramped (of) a car.
    b. *Sam drives a [too, so, this, that] cramped car.

• In general, degree modifiers that force inversion to the DP periphery are poor
  fragment answers.
• This is explained by assimilating (b) to a more general constraint on prenominal
  modification, implemented, for example, as the head-final filter (Williams, 1982;
  Di Sciullo and Williams, 1987).
  – Non-head-final phrases are ungrammatical in pre-NP position.
  – If a degree modifier is a selecting head, the phrase it projects is head-initial.
• This contrast again diagnoses very (and other degree modifiers studied by
  Needelman et al. (2004)) as an adjunct, as it is grammatical (only) in a pre-NP position.

(26)  Sam drives a [very, somewhat, incredibly] cramped car.

• Conclusion: very is diagnosed as an adjunct by two tests, a hard result to explain
  if much-support is always driven by morphosyntactic factors.
  – Alternative: much-support with very is semantically motivated. much
    introduces the required degree argument.