# The semantics of *much*-support

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- Two syntactic tests, the ability to occur as a fragment answer, and degree-inversion, diagnose the head/adjunct status of a degree modifier.

- Sometimes, the function of *much* in non-adjectival environments ("*much*-support"), is to introduce a degree argument (see Wellwood et al. (2012); Wellwood (2012)).

- The degree modifier *very*—whether or not it occurs with *much* ("*much*-support")—diagnoses whether or not a given syntactic environment makes use of degrees.

1   Introduction: Degree modifiers and constituency

- Many previous analyses of degree words (Bresnan, 1973; Corver, 1997; Kennedy, 1999; Solt, 2010, 2013, a.o.) assume a more-or-less uniform analysis in terms of phrasal status.

  – Bresnan (1973): Maximal projections; selected by QP.
  – Corver (1997): Heads; select QP.
  – Kennedy (1999): Heads: select AP.
  – Solt (2010, 2013): Maximal projections: selected by AP, but not NP, VP, etc.

- However, different degree modifiers contrast in their syntactic properties: some require *much*-support when not modifying AP (3), while others do not (4).

  (1)   a.   John is {too, so, this, that} (*much) tall.
        b.   John is as (*much) tall as Bill.
  (2)   a.   John is {somewhat, a little, a bit} (*much) tall.
        b.   John is {more, less} (*much) tall than Bill.
  (3)   a.   Mary is {too, so, this, that} *(much) under scrutiny.
        b.   Mary is {too, so, this, that} *(much) older than John.
        c.   Mary is as *(much) {under scrutiny, older than John,...} as Bill.
  (4)   a.   Mary is {somewhat, a little, a bit} (*much) {under scrutiny, older than John,...}.
        b.   Mary is {more, less} (*much) {under scrutiny, older than John,...} than Bill.

- Bresnan (1973) and Corver (1997) account for the different behaviors in terms of morphological rules and categorial differences, respectively.

  – Bresnan (1973): *much + er* → 'more'
  – Corver (1997): [$_{DegP}$ *too* [$_{QP}$ *much* [$_{AP}$ *so*]]] versus [$_{QP}$ *more* [$_{AP}$ *so*]]

- Another possibility is to not posit new categories and morphological rules, but to make the difference a selectional one—this is pursued in Neeleman et al. (2004).

(5)   a.   [DegP [Deg (Class I)] [AP]]   b.   [XP [DegP (Class II)] [XP]]
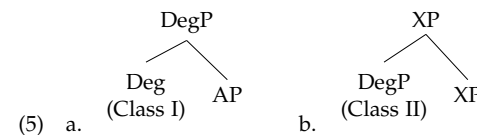
- Class I (selects for A): *too, so, this, that, as, how, very*

- Class II (doesn't select): *somewhat, a little, a bit, more, less, enough, a good deal*, deadjectival adverbs

- Neeleman et al. (2004) bring several syntactic tests to bear on the classification of a given degree word, and to support the structures given in (5).

  – Primary among these is *much*-support: (3) versus (4), above.
  – Constituency tests:

    (6)   It is inadvisable to be [$_{PP}$ [$_{DegP}$ *too* [$_{AP}$ *much*]] or [$_{DegP}$ *very* [$_{AP}$ *much*]] into syntax]. (Neeleman et al., 2004, p. 14, ex. 33)

  – Complex internal syntax: consider *a little, a bit*, which are analyzed as adjuncts.
  – Variable order of modifier and adjective:

    (7)   a.   * John is fond of Mary too for his own good. (p. 17, ex. 42a)
          b.   John—indebted to his colleagues a good deal—was being over-polite. (p. 17, ex. 43e)
          c.   John—a good deal indebted to his colleagues—was being over-polite. (ex. 43e')

  – Omission of the adjective

    (8)   a.   * Too is inadvisable. (p. 18, ex. 47a)
          b.   More is not always better. (p. 19, ex. 48a)

  – Topicalization (Dutch)

- Plan: adopt the Neeleman et al. (2004) story, but claim that *very* is an adjunct.

- Claim: *very*, rather than tracking the adjective-hood of the phrase modified, tracks the availability of degree arguments within the syntax.

2   Test 1: Fragment answers

- Question-answer paradigms like (9) support the classification proposed by Neeleman et al. (2004).

  (9) A: How tall is John? B:
      a. Very.
      b. Somewhat.
      c. A little.
      d. A bit.
      e. A good deal.
      f. Incredibly.

- Assuming only maximal projections constitute licit fragment answers.

- An implicit question makes the same case for *more* and *less*.

  (10) Is John {*more*, *less*} interesting than Mary?
      a. No, {*less*, *more*}.

- Except for *very*, all degree modifiers above fall into Class II via the tests in Neeleman et al. (2004).

- What about Class I modifiers? These are all bad (except, as diagnosed in Neeleman et al. (2004), *very*).
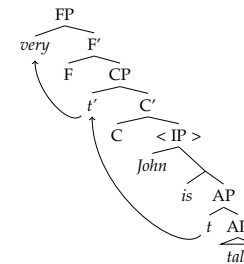
  (11) A: How tall is John? B:
      a. Too *(tall).
      b. So *(tall).
      c. This *(tall).
      d. That *(tall).
  (12) Mary is tall. How tall is John?
      a. As *(tall).

- Explained under the account of fragment answers proposed in Merchant (2004) (or any account predicting that fragments are limited to maximal projections).

(13)

- Fragment answers involve movement of the fragment, followed by ellipsis of the source clause.

  – Movement ⇒ Phrasehood

- That movement is the source of the contrast is supported by an answer's sensitivity to island effects. (See Merchant (2004) for tests diagnosing movement.)

  (14) A: Do you wonder who is tall? B:
      a. * Very.
      b. * Somewhat.
      c. * A little.
      d. * A bit.
      e. * Incredibly.
      f. * So tall.
      g. * Too tall.
      h. * This tall.
      i. * That tall.

- Compare (15), involving extraction out of an embedded clause (as illustrated by the antecedent).

  (15) A: Do you think John is tall? B:
      a. Very.
      b. Somewhat.
      c. A little.
      d. A bit.
      e. Incredibly.
      f. So tall.

    g. Too tall.

    h. This tall.

    i. That tall.

- Binding Principles A and B, when the adjective is present.

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

- Conclusions:

  – Fragment answers with degree modifiers involve movement.

  – There are two classes of degree modifiers w.r.t. selection (as in Neeleman et al. (2004)).

  – *very* is a Class II adjunct (contra Neeleman et al. (2004)).

    ∗ Note that the explanation could not be due to ellipsis of the adjectival complement of *very*. This ellipsis would have to be restricted to only occur with fragment answers.

    (17) John is somewhat tall, but Mary is very *(tall).

3 Test 2: Degree inversion

- Many studies have addressed the phenomenon inllustrated in (18) (Bresnan, 1973; Bowers, 1975, 1987; Hendrick, 1990; Kennedy and Merchant, 2000; Matushansky, 2002, a.o.).

(18) a. Sam drives {too, so, this, that} cramped (of) a car.
    b. * Sam drives a {too, so, this, that} cramped car.

- Inverting modifiers: *too*, *so*, *this*, *that*, *as*, *how*

- Insofar as they can appear attributively, modifiers Neeleman et al. (2004) diagnose as Class II don't invert.

(19) Sam drives a somewhat cramped car.

- Non-(obligatorily-)inverting modifiers: *very*, *somewhat*, *more*, *less*, *enough*, deadjectival adverbs

- Neither (cannot be used attributively): *a little*, *a bit*, *a good deal*, any complex modifier...

- (17) explained by a generally active constraint in English, and crosslinguistically (see (Grosu et al., 2007; Sheehan, 2012, a.o.)): the Head-Final Filter. Pre-nominal modifiers must be head-final.

- German example from Williams (1982) (21). Compare with English (20).

(20) a. the proud man
    b. * the proud of his children man

(21) a. der seine Pfeife rauchende Mann
      the his pipe smoking man
      'the man smoking his pipe'

- (18a) violates the same filter if the structure of the DP is as in (22).
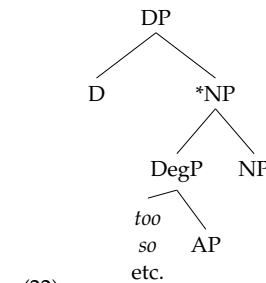
(22)

- Inversion rescues the violation. Structure for inverted elements proposed in Kennedy and Merchant (2000):
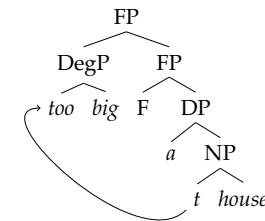
(23)

- On this test, *very* is diagnosed as a Class II adjunct.

    (24) Mike drives a very cramped car.
    (Compare **Mike drives very cramped a car*.)

- Conclusions:
    - Obligatory degree-inversion provides yet another test of a degree modifier's selectional properties.
    - Neeleman et al. (2004)'s classification is, again, generally supported.
    - *very* is, again, diagnosed as a Class II adjunct (contra Neeleman et al. (2004)).

4   *much*-support as a semantic phenomenon

4.1   *very* and *much*-support

- Recall: Patterning with Class I modifiers, *very* requires *much*-support.

    (25) a. He is very *(much) under scrutiny.
    b. Mary isn't very *(much) older than John.
    c. Bill is fond of Mary—in fact, very *(much) so.
    d. He very *(much) likes chicken.

- Proposal: (25) is explained by *very*'s need to modify a phrase with a degree argument (e.g., Kennedy and McNally (2005a)).
    - $\llbracket pos \rrbracket = \lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda x_e . \exists d_d [\mathbf{standard}(d)(G)(\mathbf{C}) \wedge G(d)(x)]$
    - $\llbracket very \rrbracket = \lambda G_{\langle d, \langle e, t \rangle \rangle} \lambda x_e . \exists d_d [\mathbf{standard}(d)(G)(\lambda y_e . \llbracket pos \rrbracket (G)(y)) \wedge G(d)(x)]$

- This is consistent with proposals that give semantic content to "dummy"-*much* (see, e.g., Schwarzschild (2006); Wellwood et al. (2012); Wellwood (2012)), but not with those that don't (see, e.g., Corver (1997); Kennedy and McNally (2005b); Solt (2010, 2013)).

- This explanation appears to run counter to proposals for degree semantics in non-adjectival domains (e.g., Kennedy and Levin (2008)).

    (26) The soup cooled {completely, slightly, very *(much)}.

    - Open question: Why is *much*-support required in (26) if it is not for selectional reasons and *cool* makes use of a degree argument?

4.2   Other modifiers

- What about degree modifiers that don't make use of *much*-support: *somewhat*, *a little*, *a bit*, *a good deal*, *enough*? (Assuming *more* and *less* involve suppletion with *much/little*.)

    - Such modifiers must not make use of a degree argument in the modified phrase. Otherwise, they would be ungrammatical, like *very* is.

- Prediction: Modifiers that don't make use of *much*-support should compose with the positive form of gradable adjectives.

- Consider the following entailments with relative adjective *tall*.

    (27) a. John is somewhat tall. ⇒ John is tall.
    b. John is a little tall. ⇒ John is tall.
    c. John is a bit tall. ⇒ John is tall.
    d. John is a good deal tall. ⇒ John is tall.

- These entailments can be explained if the modifiers don't make use of a degree argument—instead, the only true "degree morphology" is the positive morpheme (Kennedy, 1999; Kennedy and McNally, 2005a; Kennedy, 2007).

    (28)
    ```
              DegP
           _____|_____
       somewhat       DegP
                     ___|___
                    pos   tall
    ```

- Then *somewhat* in (27a) makes use of a vague property, rather than a gradable one.

- For the most part, these entailments do not go through with modifiers requiring *much*-support.

    (29) a. John is too tall (to fit through that tiny door). ⇏ John is tall.
    b. John is so tall that he can't fit through that tiny door. ⇏ John is tall.
    c. John is {this, that} tall. ⇏ John is tall.
    d. John is as tall as Mary. ⇏ John is tall.

4.3 Potential counterexample: *enough*

- It does not require *much*-support (e.g., *likes chicken enough*), so it must be an adjunct (Neeleman et al., 2004) and must not require a degree argument.

- But, it does not entail positive form: John is tall enough ⇏ John is tall

- However, there is evidence from fragment answers that *enough* is a head.

  (30) a. A: How tall is John? B:
        b. *(Tall) enough.

- And, it is not a violation of the head-final filter because of its inverted order with the adjective.

- Conclusion: The fact that *enough* doesn't require *much*-support is probably independent of its semantic status.

5 Conclusions

5.1 Neeleman et al. (2004) classification supported

- The classification scheme proposed by Neeleman et al. (2004) is generally supported by two further syntactic tests.

  – Fragment answers
  – Degree inversion

- These differences are not explained by analyses giving degree words a uniform head/phrasal status.

5.2 *very* and *much*-support

- *very* is a Class II adjunct.

- *much*-support is therefore not syntacitically motivated. Hypothesis: it is semantically motivated; *much* introduces the necessary degree argument.

5.3 Other modifiers

- Modifiers without *much*-support—*somewhat*, *a little*, *a bit*, *a good deal*—simply do not make use of a degree argument.

- This is why they entail the positive form when they occur with relative adjectives.

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