

Degree Modification in Deverbal Adjectives

Scale Structure across Categories, Part 1

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1 Degree modification in deverbal gradable adjectives

1.1 Two questions

1. What governs the distribution of the degree modifiers *well*, *very* and *much*, which are largely complementary?

- (1) a. Martin Beck is well/??very acquainted with the facts of the case.
 (cf. Martin Beck is very familiar with the facts of the case.)
 b. The facts are well/??very understood.
 c. The concert was well/??very publicized.
 d. The abuse of public funds was well/??very documented.
- (2) a. a much/??well/??very desired position
 b. a much/??well/??very needed rest
 c. a much/??well/??very praised film
 d. a much/??well/??very talked about novel
- (3) a. ??much/very tall/expensive/happy
 b. ??much/well acquainted/understood/paid

Corpus data (from the British National Corpus) mirror the acceptability judgments:

	<i>well</i>	<i>very</i>	<i>much</i>
protected	62	2	0
educated	78	3	0
defined	146	2	0
needed	2	0	211
appreciated	12	0	134
prized	0	1	16
surprised	0	154	5
worried	0	192	1
frightened	0	92	0

Table 1: Distribution of degree modifiers

2. What governs the interpretation of *well* — why does it have only a “quality” reading, and NOT a degree reading, in (4)?

The research reported here represents ongoing work with Louise McNally, Universitat Pompeu Fabra, Barcelona, Spain. See Kennedy and McNally (1999a, b, to appear).

- (4) a. The suit was well cut.
 b. The book was well written.
 c. The house was well built.

1.2 These participles are adjectives and gradable

True verbal participles and nongradable adjectives do not support modification by *very*:

- (5) a. ?? The president was *very impeached* by the House of Representatives.
 b. ?? Richard Nixon, a *very former* president, resigned before he was impeached.

The participles that disallow modification by *very* allow *un-*prefixation:

- (6) a. For in a world as yet *unacquainted* with the horrors of the mushroom cloud, poison gas was still regarded as the ultimate in hideous weapons. [Brown Corpus F02]
 b. The singer's *unpublicized* appearance caused a commotion at the restaurant.
 c. The abuse of public funds was *undocumented* and thus the accused minister had to be released.
 d. *uneducated, undefined, unbalanced, unprotected*

They can appear as complements to copular verbs such as *seem*, *remain* or *become*:

- (7) a. Beck seemed *acquainted* with the facts of the case.
 b. The phenomenon remains poorly *understood*.
 c. The scandal became *publicized* after a leak to the press.
 d. The case remained *documented* on file.

They appear in comparative constructions:

- (8) a. But as I became *more acquainted* with this set and stopped rushing from impossible passage to impossible passage, hoping against hope that at some point he would lose his balance and tumble like a second-rate trapeze artist off his swing, I was unwittingly dragged in to a more sinister, melancholic side to his playing. [CD Review. Berkhamstead: CD Review Ltd, 1992. (BNC)]
 b. After a moment or two, the maternity nurse, finding that her ruse of trying to get mother and baby *more acquainted* was not going to work, took him from her. [Pamela Streeet, *Guilty parties*. London: Robert Hale Ltd, 1990. (BNC)]
 c. The causes of weakness in adhesion are rather *less understood* at present than they are in cohesion but no doubt they are rather similar in character. [J. Gordon, *The New Science of Strong Materials*. 1991. (BNC)]
 d. This was certainly more dramatic than the *more publicized* event that finished off the dinosaurs. [Antony Milne, *The Fate of the Dinosaurs: New Perspectives in Evolution*. 1971. (BNC)]

We conclude that the facts in (1)-(4) cannot be explained in terms of category mismatch: the deverbal adjectival element has standard adjectival syntax (see Borer 1998, pp. 92–93).

1.3 Our proposal

The distribution of degree modifiers is not due to idiosyncratic properties of certain deverbal adjectives, but rather reflects deeper aspects of the semantics of degree modification and the relation between the aspectual structure of verbs and the scalar structure of gradable adjectives.

1. The degree modifier *very* requires the adjective it modifies to be associated with what we call a “nontrivial standard” — a context-dependent value that determines whether an adjectival predication is true or false of an object.
2. In contrast, *much* modifiers adjectives with “trivial standards” — standard values that are not context-dependent.
3. The trivial/nontrivial standard distinction is closely tied to scale structure: whether a scale is *open* (no endpoints) or *closed* (endpoint(s)).
4. The degree word *well* is an adverbial expression that combines only with adjectives that are associated with totally closed scales: scales with two endpoints.
5. The class of deverbal adjectives with closed scales corresponds to the class of verbs that introduce incremental themes (Krifka 1989, 1992; Dowty 1991; Ramchand 1997).
6. The degree reading of *well* is blocked when the standard for the participle it modifies corresponds to an *upper* endpoint of a scale.

2 Scale structure and degree modification

2.1 Scales, standards of comparison, and context dependence

The interpretation of gradable adjectives in sentences such as (9a) and (9b) can be characterized in terms of a contextually defined “standard” of comparison (see e.g. Sapir 1944; McConnell-Ginet 1973; Kamp 1975; Klein 1980, 1991; Bierwisch 1989; Ludlow 1989; Kennedy 1999).

- (9) a. Bill Bradley is tall.
 b. The Mars Pathfinder mission was inexpensive.
- (10) a. Bill Bradley’s height is at least as great as a standard of tallness (for politicians/for basketball players).
 b. The cost of the Mars Pathfinder mission was at least as great as a standard of inexpensiveness (for missions to outer space/for things in general).

Assume that the semantic analysis of gradable adjectives involves ordering relations between points or “degrees” on a scale (see e.g. Cresswell 1977; Klein 1991), where scales and degrees are defined as in (11).

- (11) a. A scale S is a linearly ordered, infinite set of points.
 b. A degree d is a convex, nonempty subset of a scale (a subset of the scale with the following property: $\forall p_1, p_2 \in d \forall p_3 \in S [p_1 < p_3 < p_2 \rightarrow p_3 \in d]$).

(9b) has the logical form in (12), where *inexpensive* is a function from objects to degrees (Bartsch and Vennemann 1973; Kennedy 1999) and $d_S(\text{inexpensive})$ is a free variable over degrees that denotes a standard for *inexpensive*.

- (12) $\text{inexpensive}(\text{marspathfinder}) \succeq d_S(\text{inexpensive})$

Since the value of d_S is contextually determined, (9b) may be true in a conversation about the space program but false in a discussion about things with the name “Pathfinder” (compasses, mountain bikes, sport utility vehicles, missions to Mars, etc.).

Not all gradable adjectives display the same sort of context-dependence, however. The standards for adjectives like those in (13) appear to be fixed:

- (13) a. The baby is awake.
 b. The cookie jar is empty.
 c. The line is straight.

Such examples *are* gradable: unlike true nongradable adjectives like those in (14), *awake* and *empty* are felicitous in comparatives, as shown by the contrast between (15) and (16).

- (14) a. Chan Ho Park is Korean (i.e. of Korean origin).
 b. Dinosaurs are extinct.
- (15) a. The baby is more awake now than it was a few minutes ago.
 b. The cookie jar is emptier than it was this morning.
 c. The red line is straighter than the blue line.
- (16) a. ?? Chan Ho Park is more Korean than I am.
 b. ?? Dinosaurs are more extinct than spotted owls.

The difference in context sensitivity is further illustrated by the acceptability of *for*-phrases, which explicitly identify a comparison class for the determination of a context-sensitive standard.

- (17) a. Bill Bradley is tall for a politician.
 b. Michael Jordan was short for a basketball player
 c. The Mars Pathfinder Mission was inexpensive for a space mission.
- (18) a. ?? The glass is empty for a beer mug.
 b. ?? Ella is awake for a baby.
 c. ?? That door is open for a back door.

• What is responsible for this difference in context-sensitivity?

2.2 Different scales, different standards

2.2.1 Scale structure and proportional modification

The two classes of adjectives discussed in section 2.1 differ with respect to the acceptability of modification by “proportional expressions” like *completely*, *partially*, and *half*:

- (19) a. completely empty/full/awake/straight
 b. partially empty/full/awake/straight

- c. half empty/full/awake/straight
- (20) a. ?? completely tall/short/interesting/expensive
 b. ?? partially tall/short/interesting/expensive
 c. ?? half tall/short/interesting/expensive

These facts can be explained in terms of scale structure (cf. Lehrer 1985; Hay 1998; Hay, Kennedy, and Levin 1999):

1. Distinguish two types of scales:
 - (a) CLOSED SCALES: scales with maximal and minimal values (endpoints)
 - (b) OPEN SCALES: scales without maximal or minimal values (endpoints)
2. Expressions like *completely*, *partially*, etc. make reference to an *endpoint* of a scale.
3. The adjectives in (19) map objects onto closed scales; those in (20) map objects onto open scales.

NB: Endpoint-oriented uses of *completely* and *totally* must be distinguished from non-endpoint-oriented uses. (In the following examples, “#” indicates contradiction.)

- (21) a. I'm completely thrilled by this opportunity, and my sister is even more thrilled than I am.
 b. I'm totally uninterested in phrenology, and Bob is even less interested than I am.
- (22) a. #The line is completely straight, though you can make it straighter.
 b. #The bottle is totally empty, but it could be even emptier.

2.2.2 *Trivial vs. nontrivial standards*

The difference in scale structure between *empty*-type adjectives and *tall*-type adjectives parallels the difference in context-sensitivity of the standard:

- Adjectives associated with open scales have context-sensitive standards and make reference to comparison classes.
- Adjectives with closed scales normally have context-insensitive standards and do not make reference to comparison classes.

To distinguish between these two types of adjectives, we introduce the terminology in (23):

- (23) a. An adjective has a *nontrivial standard* iff its standard value is determined contextually with respect to a comparison class.
 b. An adjective has a *trivial standard* iff its standard is not determined contextually with respect to a comparison class.

In the default case, the standard value for a closed-scale adjective is to the endpoint of the scale:

- (24) a. The baby is awake. \approx The baby is minimally awake.
 b. The cookie jar is empty. \approx The cookie jar is completely empty.
 c. The line is straight. \approx The line is completely straight.

Entailment patterns provide a test for trivial standards.

- (25) a. $[x \text{ is } \alpha] = 1$ iff $\alpha(x) \succeq d_s(\alpha)$
 b. $[x \text{ is not } \alpha] = 1$ iff $\alpha(x) < d_s(\alpha)$

- If an adjective α has a trivial standard, then:
 1. if α 's standard corresponds to the lower end of the scale, a statement of the form ‘ x is not α ’ should entail that x has no amount of “ α -ness” at all, and
 2. if α 's standard corresponds to the upper end of the scale, ‘ x is α ’ should (in normal usage) entail that x has a maximal amount of “ α -ness”.
- Neither of these entailments should hold if α has a nontrivial standard.

- (26) a. #My hands are not wet, but there is a little bit of water on them.
 b. #The candle is straight, but you could make it straighter.
- (27) a. Sam is not tall, but he is taller than my sister.
 b. The film is interesting, but it could be more interesting.

Aside: The only way the ordering relation in (25b) could fail to hold for a lower-endpoint standard is if the result of applying α to x were no value at all, i.e. the “empty degree”. This result can be straightforwardly derived in a model in which degrees are formalized as intervals (sets of points) on a scale, as in Seuren (1978); von Stechow (1984); Kennedy (to appear). In this type of approach, the empty degree is simply the empty set, which satisfies the ordering relation in (25b) for a lower-endpoint $d_s(\alpha)$.

2.3 *The relation between trivial standards and closed scales*

A prediction and a non-prediction:

1. If an adjective has a trivial standard, then it has a closed scale.
2. Not all adjectives with closed scales have trivial standards.

- (28) a. I'm completely full after that piece of cake.
 b. Beck is completely familiar with the problem.
- (29) a. I'm full, but I could squeeze in one small piece of cake.
 b. Beck is familiar with Barcelona but doesn't know whether Diagonal extends all the way to the sea.

The correlation between closed scales and trivial standards represents a (possibly overridable) default.

- Since the endpoint of the scale provides a natural and *fixed* reference point to use as a standard, closed scale adjectives are conventionally associated with trivial standards.
- Such a strategy is unavailable to open scale adjectives.

Speakers use the endpoint as a standard because they can!

3 Scale structure and degree modification

3.1 'Very' and 'well'

Examples like (30) show that the semantic contribution of *very* is closely tied to the standard value: the difference between e.g. *expensive* and *very expensive* is that the latter denotes a property whose meaning is just like the former, except that the standard value is “boosted” by some (context-dependent) amount.

- (30) a. The international space station is very expensive. (for space projects; *large increase in the standard*)
 b. The coffee at the airport is very expensive. (for coffee; *smaller increase in the standard*)

The connection between *very* and the standard value is not unrestricted, however. In normal usage, adjectives associated with *trivial* standards do not accept modification by *very*:

- (31) a. ?? They were very able to solve their own problems.
 b. ?? The baby is very awake. (≠ wide awake)

We conclude that there is a felicity condition on the use of *very*: *very* presupposes that the standard associated with the adjective it modifies is nontrivial.

This hypothesis is implemented in (32), in which G is a function from objects to degrees (a gradable adjective meaning), $d_G(G)$ is the standard for G , and LARGE is a context-dependent function that identifies the amount by which the standard value should be increased (for approaches to degree addition see Hellan 1981; von Stechow 1984; Klein 1991).

- (32) $[[very]] = \{ \langle G, \langle d_G(G), x \rangle \mid \text{Eid}[G(x) \geq d_G(G) + d \wedge \text{LARGE}(d)] \}$
 CONDITION: $d_G(G)$ is nontrivial

In contrast to *very*, *well* combines felicitously with adjectives that come with trivial standards, but not with adjectives that have nontrivial standards:

- (33) a. We are well aware of the difficulties.
 b. They are well able to solve their own problems.
 (34) a. ?? Rik Smits is well tall.
 b. ?? The international space station is well expensive.

Note also that the output of *well* modification, unlike *very* modification, supports a full range of further degree modification, including participation in comparative constructions:

- (35) a. They are very/quite/only too/hardly well able to cope with the situation.

- b. Sam is more well aware of the difficulties now than he was before.
 (36) a. ?? They became quite/only too/hardly very happy at the news.
 b. ?? Michael Jordan is less very tall than Shaquille.
 c. ?? The new place is quite/only too/hardly much preferable to the old one.
 d. ?? My vacation is more much needed than yours.

- (37) a. We are very well aware of the difficulties.
 b. They are very well able to solve their own problems.

We conclude that *well* denotes a function from (gradable) adjective meanings to adjective meanings, such that the input has a closed scale and the output has an open scale.

- (38) $[[well]] = \{ \langle G, G' \rangle \mid G \text{ is a function from objects to closed scales and } G' \text{ is a function just like } G \text{ except that its range is an open scale} \}$

It follows that the output of *well*(G) must have a nontrivial standard, correctly predicting that degree modification by *very* should be possible.

3.2 Deverbal adjectives revisited

Recall that the data in (1) demonstrated that for deverbal gradable adjectives, modification by *very* is infelicitous, while modification by *well* is possible.

The examples in (39) extend this descriptive generalization, demonstrating that modification of the “*well* A” complex by *very* is also possible.

- (39) a. Martin Beck is very well acquainted with the facts of the case.
 b. The facts are very well understood.
 c. The concert was very well publicized.
 d. The abuse of public funds was very well documented.

According to the semantic analysis of *very* and *well* developed above, the facts in (1) and (39) follow if these participles are associated with trivial standards and closed scales.

They have closed scales (*completely* test):

- (40) a. Beck is completely/fully/partially acquainted with the facts of the case.
 b. Language change is completely/fully/partially understood.
 c. The concert was fully publicized in all of the mass media.
 d. Those war crimes are completely/fully/partially documented.
 e. fully educated, completely defined, fully balanced, partially protected

They have trivial standards (entailment test):

- (41) a. # Beck isn't acquainted with the facts facts of the case, though I did show him the coroner's report.
 b. # The importance of the Dolly experiments is not understood, though we know that the data suggests that it might be possible to clone humans.
 c. # The concert was not publicized, but there were a few posters in the metro announcing it.
 d. # The details of the murder were not documented, though the police reports contain a record of a weapon at the scene of the crime.

3.3 'Much'

The distribution of *much* strongly suggests that it is a degree modifier similar to *very*:

- (42) a. ?? Your help is quite/only too/hardly much needed.
 b. ?? My vacation is more much needed than yours.

There is an important difference between the two, however, and a corresponding similarity between *much* and *well*: *much* only modifies adjectives with *trivial* standards.

- (43) a. Seoul is much different from what I expected.
 b. Kimchee is much superior to saurkraut.
 c. I think it would be much preferable to have a face-to-face interview.

- (44) a. # Seoul is not different from what I expected, but it is a little different from what I expected.
 b. # Kimchee is not superior to saurkraut, though it is better than saurkraut.
 c. # I think it would be preferable to have a face-to-face interview, though I don't think it would be good to see her.

The hypothesis that *much* needs a trivial standard is made explicit in (45).

- (45) $[\llbracket much \rrbracket = \{ \langle G, \langle d_s(G), x \rangle \} \mid \exists d[\langle G(x) \succeq d_s(G) + d \wedge \text{LARGE}(d)] \}]$
 CONDITION: $d_s(G)$ is trivial

Prediction 1: *Much* should be acceptable with derived adjectives with trivial standards (like *well*), but it should not be able to modify adjectives whose standard corresponds to the *upper* endpoint of a scale.

Participles that accept modification by *much* have trivial standards; these standards systematically correspond to lower endpoints:

- (46) a. # The war was not desired, but certain parties hoped that a conflict would break out.
 b. # Your financial support is not needed, but we could use a small contribution from you.
 c. # The film was not praised, but one critic said good things about it.
 d. # The problem was not talked about, though Frank mentioned it to his mother.

Prediction 2: Nothing should require the modified adjective's scale to be closed on the *upper* end, therefore it should be compatible with adjectives that have *partially* closed scales.

Participles that prefer modification by *much* are unacceptable with proportional modifiers:

- (47) a. ?? a completely/fully/partially desired result
 b. ?? a completely/fully/partially needed rest
 c. ?? a completely/fully/partially praised film
 d. ?? a completely/fully/partially talked about novel

Some answers to Question 1

- Deverbal gradable adjectives like *acquainted*, *understood* and so forth accept modification by *well* but not *very* because they:
 - are associated with closed scales, and
 - have trivial standards.

- The distribution of *much* is complementary to that of *very* because the two are sensitive to different kinds of standards.
- The distribution of *much* should be at least partially complementary to that of *well*, since, unlike the latter, it is compatible with scales that are closed only on one end.

New questions

- To what extent is *much* compatible with adjectives whose scales are closed on *both* ends? Nothing prohibits it from modifying such adjectives, but facts such as those in (3) may ultimately be evidence that *much* selects not just for a trivial standard, but for a scale which is only partially (and crucially not totally) closed.
- Why is *much* so commonly found with comparatives or with adjectives that have comparative-like meanings (*preferable*, *superior*, etc.)?
 → *Comparatives have trivial standards!*

3.4 Summary

If we are correct, we have a powerful tool for identifying the lexical semantic properties of gradable adjectives (derived or otherwise) on the basis of their collocational patterns:

- (48) a. TOTALLY OPEN SCALE – NONTRIVIAL STANDARD – $\sqrt{\text{very}}$ – ?? *well* – ?? *much*
 b. TOTALLY CLOSED SCALE – TRIVIAL STANDARD – ?? *very* – $\sqrt{\text{well}}$ – ?? *much*
 c. PARTIALLY CLOSED SCALE – TRIVIAL STANDARD – ?? *very* – ?? *well* – $\sqrt{\text{much}}$

More generally, the range of facts involving *very*, *well*, and *much* indicates that three of the four logically possible (linear) scale types are used in natural language:

- totally open scales
- totally closed scales
- scales which are closed on the bottom and open on the top

An important question: Are there adjectives whose scales are closed only on the upper end, and if so, are there degree modifiers that are sensitive to them?

4 From aspectual structure to scalar structure

The fact that the adjectival participles we are interested in have trivial standards follows from their (closed) scalar structure, but *why do they have closed scales?* To answer this question, we need to look at the event structures of the source verbs (cf. Yumoto 1991).

Gradable adjectives derived from many ACHIEVEMENT and ATTELIC verbs can be modified by *very*:

- (49) a. very chipped/scratched/dented/fragmented/distracted/alarmed
b. very worried/interested/disappointed/bored/impressed

The data discussed in this talk seem to indicate that the class of gradable deverbal adjectives that disallow modification by *very* corresponds closely to the class of verbs that introduce incremental themes (Krifka 1989, 1992; Dowty 1991; Tenny 1995; Jackendoff 1996).

The verbs in this class are uniquely characterized by the homomorphic relationship between the events they denote and their incremental theme arguments (see Krifka's notion of *Mapping to Objects* (Krifka 1989, p. 92)).

We claim that this homomorphism provides a template for building scalar structures for the corresponding adjectives such that:

1. The lower endpoint of the scale corresponds to the minimal (sub)event involving (a minimal part of) the incremental theme.
2. The upper endpoint corresponds to the maximal event involving (all of) the incremental theme.

Result 1: Adjectives derived from verbs with incremental themes have closed scales.

(50) *Non-IT verbs*

- a. ? a completely hated/loved/envied/admired neighbor
- b. ? a fully needed/wanted rest
- c. ? a partially regretted action
- d. ? a completely looked for/expected reaction
- e. ? a fully driven/pushed car
- f. ? a completely watched suspect
- g. ? a partially kissed/met/punched young man
- h. ? a completely worried/pleased/surprised mother

(51) *IT verbs*

- a. a partially eaten meal
- b. a fully written novel
- c. completely loaded hay
- d. a completely paid bill
- e. fully straightened teeth
- f. a partially heard response

- g. a partially anticipated reply
- h. a fully understood problem

Result 2: Since adjectives with closed scales are conventionally associated with trivial standards, the members of this class of deverbal adjectives also have trivial standards.

5 The orientation of the trivial standard and the interpretation of 'well'

Why does *well* have a degree reading in (52a) but not in (52b)?

- (52) a. Beck is well acquainted with the facts.
b. The house is well built.

The answer is closely tied to a separate question: when does a trivial standard correspond to an upper endpoint, and when does it correspond to a lower endpoint?

An observation: On the degree reading of 'well', *x is well* ϕ presupposes that *x is* ϕ .

- (53) a. Beck isn't well acquainted with the facts of the case.
b. Is Beck well acquainted with the facts of the case?
c. Beck is acquainted with the facts of the case.

General Claim:

The orientation of the standard depends on the semantic role of the participial adjective's argument in the event associated with the corresponding verb.

SUBCLAIM 1: (Participial) adjectives (with trivial standards) whose arguments satisfy *Mapping to Objects* (such as *written*) have upper endpoints as standards.

Why: Because we cannot assert that the eventuality corresponding to the participle is completed, and thus that the adjectival participle truthfully applies to its argument, until this argument has been totally affected/moved/changed.

$$(54) \quad VR[\text{MAP-O}(R) \leftrightarrow \forall e \forall e' [R(e, x) \wedge e' \subseteq_E e \rightarrow \exists x' [x' \subseteq_O x \wedge R(e', x')]]]$$

MAP-O guarantees that all subevents e' of a given event e with participant x in role R will involve a part x' of x (see also Ramchand 1997; Tenny 1995).

- Such adjectives should exclude modification by *very*.
- Such adjectives should also exclude degree modification by *well*, because the semantic effect of *well*-modification (removal of the upper endpoint of the scale) is incompatible with the fact that *x is well* *adj* presupposes that *x is* *adj*.
- Such adjectives should accept degree modification by expressions that are sensitive to scale structure but not standards of comparison (e.g., "proportional" modifiers).

- (55) a. A(n un)written letter
b. #The letter is written, but the last paragraph remains unfinished.

- c. ?? The first letter is more/less written than the second.
 - d. ?? A very written letter
 - e. A well-written letter (no degree reading)
 - f. A half/partially written letter
- (56)
- a. ??a very crossed desert/a well-crossed desert (no degree reading)/a half crossed desert
 - b. ??a very painted house/a well-painted house (no degree reading)/a half painted house
 - c. ??very eaten food/well-eaten food (no degree reading)/half-eaten food
 - d. ??very loaded hay/a well-loaded pile of hay (no degree reading)/a half-loaded pile of hay

SUBCLAIM 2: Those adjectives whose arguments are not incremental themes (such as *acquainted*) have lower bounds as standards.

Why: Since the completion of the eventuality corresponding to the participle does not depend on affecting all of the relevant argument (or affecting that argument in its entirety), we can assert that the eventuality is completed, and thus that the adjectival participle truthfully applies to its argument, even when that argument has been involved/affected to only a minimal degree in an eventuality of the relevant kind.

- Such adjectives should exclude modification by *very*.
 - Such adjectives should admit degree modification by *well*.
 - Such adjectives should also accept degree modification by expressions that are sensitive to scale structure.
- (57)
- a. ??very acquainted with the news/well acquainted with the news (degree reading possible)/fully acquainted with the news
 - b. ??very dimmed lights/well-dimmed lights (degree reading possible)/partially dimmed lights
 - c. ??a very understood problem/a well-understood problem (degree reading possible)/a half-understood problem
- A particularly interesting minimal pair:
- (58)
- a. a well-loaded truck (degree reading possible)
 - b. well loaded hay (no degree reading)

This suggests that the *hay* argument is the incremental theme (cf. Jackendoff 1996; Hay et al. 1999).

6 Explorations at the adjective/verb interface

The verbal participle/adjective distinction can look squishy because of the many participles that pass only some of the standard tests for adjectivhood.

- (59)
- understood*
 - a. ok after *become* (but marginal after *seem*)
 - b. admits comparatives
 - c. unattested with *very*
 - d. *un-* counterpart unattested
- (60)
- documented*
 - a. ok after *remain* (but not *become* or *seem*)
 - b. has *un-* counterpart
 - c. no comparatives attested
 - d. unattested with *very*

A hypothesis for future testing: TRIVIAL STANDARDS are more verb-like; NONTRIVIAL STANDARDS are more adjective-like.

- Not all adjectives have nontrivial standards (cp. *empty*), but perhaps the “least very” ones do. Those adjectives with trivial standards will, all things being equal, seem more “very”.
- If there is “categorical instability” in the participle domain (e.g. a tendency for participles to move into the adjective category), perhaps we can understand this phenomenon partly in terms of “standard shifting.”

- (61)
- educated* (candidate example)
 - a. Definition in the *OED* (written on historical principles): “That has received education, mental or physical; instructed, trained, etc; see the vb. Often with an adverb prefixed, as *half-, over-, well-.*”
 - b. Definition in the *Collins Cobuild English Dictionary* (based on corpus of English of the 1980s): “Someone who is educated has a high standard of learning.” (classified as a gradable adjective).

A related question: Crosslinguistically, in languages with fewer numbers of (gradable) adjectives, what kinds of meanings are encoded? With what kinds of scalar structures?

Expectation: In languages with fewer adjectives (e.g. in the Bantu family), those attested will more likely be those with nontrivial standards.

7 Conclusion

Our answers to the questions we started with:

- Whether a participle admits degree modification by *very*, *well*, or *much* depends on whether its is associated with a closed or open scale and a trivial or nontrivial standard.

- Whether *well* has a degree or manner/quality reading depends on whether the (trivial) standard for the adjective's scale is an upper endpoint or a lower endpoint.

More generally, our study illustrates some of the benefits to be gained from investigating even a very small lexical semantic phenomenon:

- Insight into scalar semantics in general and the aspects of scalar structure to which natural language is sensitive.
- Insight into the relationship between event structure and adjectival scale structure.
- A powerful tool for identifying semantic characteristics of adjectives based on collocational patterns and knowledge of verb meaning.

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