WHERE DOES NOMINAL GRADABILITY COME FROM?
MISGIVINGS, SECOND THOUGHTS, REGrets, AND THE HOPE OF REDEMPTION

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Something we think we understand (Kennedy & McNally 2005, Rotstein & Winter 2001, others):

(1) a. rather \(\left\{\begin{array}{l}
\text{transparent} \\
\text{straight} \\
\text{long}
\end{array}\right.\)

b. perfectly \(\left\{\begin{array}{l}
\text{transparent} \\
\text{straight} \\
\#\text{long}
\end{array}\right.\)

c. partly \(\left\{\begin{array}{l}
\#\text{transparent} \\
\#\text{straight} \\
\#\text{long}
\end{array}\right.\)
Something we don’t really understand:

(2)

a. real
\[
\begin{cases}
\text{idiot} \\
\text{smoker} \\
\text{sportscar}
\end{cases}
\]

b. big
\[
\begin{cases}
\text{idiot} \\
\text{smoker} \\
\#\text{sportscar}
\end{cases}
\]

c. utter
\[
\begin{cases}
\text{idiot} \\
\#\text{smoker} \\
\#\text{sportscar}
\end{cases}
\]

(#indicates ill-formedness on a degree reading)
Big-picture questions:

- How does nominal gradability come about?
- What makes certain nouns more easily gradable than others?
- How do nouns differ from adjectives with respect to gradability?
- What does this reveal about gradability in general?
Guiding ideas:

- Nouns are only indirectly gradable.
- Nouns lack a degree argument, but ... 
- ... some are nevertheless associated with scales.
- A major axis of variation among degree-modified nouns: how a scale is retrieved from a noun meaning.
Roadmap

- Adnominal degree morphemes
- Prototypicality modifiers
- Dimensions and dimensional modifiers
- Conclusion
The modifiers in (3) are not actually (ordinary) adjectives (Morzycki 2009, de Vries 2010, Xie 2010; cf. Constantinescu 2011):

\[
\begin{align*}
\text{true} & \quad \text{real} \\
\text{real} & \quad \text{slight} \\
\text{total} & \quad \text{utter} \\
\text{utter} & \quad \text{absolute} \\
\text{absolute} & \quad \text{outright} \\
\end{align*}
\]

\[
\begin{align*}
\text{disaster} & \quad \text{idiot} \\
\text{idiot} & \quad \text{magic} \\
\text{magic} & \quad \text{bullshit} \\
\end{align*}
\]
The size adjectives in (4) *are* regular adjectives, but doing something special:

\[
\begin{align*}
&\text{big} \\
&\text{huge} \\
&\text{colossal} \\
&\text{humungous} \\
&\text{idiot} \\
&\text{small} \\
&\text{little} \\
&\text{diminutive}
\end{align*}
\]
Adnominal degree morphemes: Not ordinary adjectives

Not the same meaning as homophonous adjectives:

- *true bullshit* would, on the usual meaning of *true*, be contradictory
- *true disaster* vs. *untrue disaster*
- *total idiot* but not *partial idiot*
- some don’t even have adjectival homophones: *utter, downright, out-and-out, straight-up, outright*
No predicative use:

\[
\text{That} \left\{ \begin{array}{l}
\text{disaster} \\
\text{idiot} \\
\text{magic} \\
\text{bullshit}
\end{array} \right\} \text{ is } \left\{ \begin{array}{l}
\text{true} \\
\text{real} \\
\text{utter} \\
\text{absolute} \\
\text{outright}
\end{array} \right\} .
\]

Even worse with \textit{seem}, a classic diagnostic of adjective-hood:

\[
\text{That} \left\{ \begin{array}{l}
\text{disaster} \\
\text{idiot} \\
\text{magic} \\
\text{bullshit}
\end{array} \right\} \text{ seems } \left\{ \begin{array}{l}
\text{true} \\
\text{real} \\
\text{utter} \\
\text{absolute} \\
\text{outright}
\end{array} \right\} .
\]
Can’t support their own degree modification:

\[(7) \quad \#\text{some} \quad \begin{aligned}
&\text{absolutely true} \\
&\text{completely real}
\end{aligned} \quad \begin{aligned}
&\text{disaster} \\
&\text{idiot}
\end{aligned} \\
\begin{aligned}
&\text{very utter} \\
&\text{quite absolute}
\end{aligned} \quad \begin{aligned}
&\text{magic} \\
&\text{bullshit}
\end{aligned} \\
\begin{aligned}
&\text{fully outright}
\end{aligned} \]
Broadly similar facts in other languages (examples welcome!).

Japanese:

(8) \[ \{ \text{mattaku-no utter} \} \quad \{ \text{kanzen-na absolute} \quad \{ \text{kanpeki-na outright} \} \quad \text{baka idiot} \]
Japanese counterparts also lack a predicative use:

(9)  #Ano-baka-wa that idiot \(\{\text{mattaku utter} \atop \text{kanzen absolute}} \atop \text{kanpeki outright}\} \text{-da} .

‘That idiot is utter/absolute/outright.’
Japanese counterparts also can’t support their own degree modification:

(10) \#

\[
\begin{align*}
\text{tometo} & \quad \text{mattaku-no} \\
\text{very} & \quad \text{utter} \\
\text{kanari} & \quad \text{kanzen-na} \\
\text{pretty} & \quad \text{absolute} \\
\text{motto} & \quad \text{kanpeki-na} \\
\text{more} & \quad \text{outright} \\
baka & \\
\text{idiot}
\end{align*}
\]
Adnominal degree words often have ad-adjectival cognates:

(11)  
   a. true ~ truly  
   b. real ~ really  
   c. utter ~ utterly  
   d. slight ~ slightly  
   e. absolute ~ absolutely  
   f. outright ~ outright (e.g., outright dead)  
   g. flat-out ~ flat-out (e.g., flat-out dead)  
   h. downright ~ downright (e.g., downright dead)
Adnominal degree morphemes:

Summary

Adnominal modifiers (at least the ones at issue here):

- syntactically & semantically distinct from ordinary adjectives
- analogous to degree morphemes in AP such as more, very, less, really
Roadmap

- Adnominal degree morphemes
- Prototypicality modifiers
- Dimensions and dimensional modifiers
- Conclusion
Nouns support more structurally complicated degree constructions too:

(12)  a. Clyde is more phonologist than phonetician.
     b. Clyde is more of an idiot than Floyd.

(13)  a. Clyde is a bigger idiot than Floyd.
     b. Clyde is as big an idiot as Floyd.
Reasons to think nouns have a degree argument:

- Nouns have specialized degree words.
- Nouns support comparatives and equatives.
- Gradability is crosscategorial (Sapir 1944, Bolinger 1972, Abney 1987, Doetjes 1997, others).

Slap on a degree argument and go home?
But nouns aren’t *as* gradable as adjectives.

If they both had degree arguments, what’s the difference?
Project from here on: degree morphemes in the absence of degree arguments.

*Real* and *true* occur relatively freely (see also Constantinescu 2011):

\[
\begin{align*}
\{ \text{real} \} & \begin{cases} \text{disaster} \\
\text{idiot} \\
\text{smoker} \\
\text{basketball fan} \\
\text{American} \\
\text{sportscar} \end{cases} \\
\{ \text{true} \} 
\end{align*}
\]

(14)

Similar freedom in Japanese (*hontoo-no* ‘real’).
Analytical intuition: *real* and *true* use scales of prototypicality. A *real idiot* is an especially prototypical one.

Prototypicality is a bit slippery. Predictions?

NPs with no prototypes (Kamp & Partee 1995) should be odd with *real*:

\[(15) \quad \text{Floyd is a} \begin{cases} \text{real} \\ \text{true} \end{cases} \begin{cases} \text{??male nurse} \\ \#\text{non-Methodist} \\ \#\text{resident} \end{cases}. \]
Possibly related to contrastive focus reduplication (Ghomeshi et al. 2004):

(16) I’ll make the fruit salad, and you make the SALAD-salad.

They explicitly appeal to prototypicality.

(Is it possible to test this for nouns without prototypes?)
Possibly related to Japanese *rashii* (McCready & Ogata 2007):

(17) onna rashii onna
    woman RASHII woman
    ‘feminine woman’

M&O call this a ‘stereotypical adjective’ which requires ‘exemplify[ing] the properties ordinarily associated’ with an individual.
Perhaps even related to *-ish* and *-like*:

(18) a. I read something novel-*{ish like}*.

b. That bird was pigeon-*{ish like}*.
**Prototypicality modifiers:**

**Sketch of an analysis**

*Real sportscar* (roughly): ‘very similar to the prototypical sportscar’.

Ingredients:

- **prototype** maps a noun denotation to its prototype
- **similar[^c]** maps an individual and a prototype to the (maximal) degree of their similarity (in \( c \))
- **standard[^c](N)** = the degree of similarity to a prototype sufficient to count as a member of extension of \( N \) (in \( c \))
- \( >>[^c] \) is a vague ‘considerably exceeds’ relation
*Real* requires exceeding the standard considerably (like *very*):

\[(19)\]

a. \[ \text{[real]}^c = \lambda f \lambda x . \text{similar}_c(x, \text{prototype}(f)) \gg_c \text{standard}_c(f) \]

b. \[ \text{[real sportscar]}^c = \lambda x . \text{similar}_c(x, \text{prototype(sportscar)}) \gg_c \text{standard}_c(sportscar) \]
Unmodified noun:

(20)  \[ \text{the sportscar} \] = \iota x [\text{sportscar}(x)]

Assuming (21):

(21) \text{sportscar}(x) \iff \text{similar}_c(x, \text{prototype(sportscar)}) > \text{standard}_c(\text{sportscar})
These are doubly ruled out:

(22)  a. #That sportscar is real.
    b. #a very real sportscar

Wrong category, wrong type.
Contrast with *more of a*, which is also relatively free:

\[(23) \quad \text{a. This is more of a } \{ \text{disaster, idiot, smoker, basketball fan, American sportscar} \}. \]

\[\text{b. Floyd is more of a } \{ \text{male nurse, non-Methodist, resident} \} \text{ than Clyde.} \]

Suggests that *more of a* not about prototypes.
Is the notion of a prototypical idiot appropriate or even coherent?

A *real sportscar* may actually be quite atypical. Likewise for *real idiot*. Is this a problem?
De Vries (2010): most gradable nouns have upper-open scales.

Intuitively, no upper bound on e.g. idiocy. More important:

(24) a. This glass is more full than that one. **entails**: That one isn’t full.

   b. Floyd is more of an idiot than Clyde. **doesn’t entail**: Clyde isn’t an idiot.

Any scale based on proximity to a prototype should be upper-closed.
Same issue:

- Suppose George is the prototypical idiot.
- Now take away a few brain cells. Was this actually the prototype all along?
- Keep going. Now he’s dead. Is this the prototype?
The desiderata: to explain...

- atypical *real sportscar*
- *real idiot*
- oddness in e.g. *real non-Methodist*
- perhaps, why *more of a* isn’t sensitive to prototypes but nevertheless similarly promiscuous
- relation to the non-fake reading?
De Vries (2010): any scale based on proximity to a prototype should be upper-closed. We need to talk about better or worse *exemplars*, not prototypes.

So:

- *real sportscar*: a good exemplar of a sportscar

- *real idiot*: a good exemplar of an idiot

Straightforward to implement.
What about *real sportscars* and *real idiots* being unusual?

- prototypical exemplars of a category aren’t *typical*
- the prototypical triangle presumably exist in the real world
- similar reasoning should go through for exemplars
Worry:

- People find 2 and 4 better exemplars of even numbers than 34 and 806 (Armstrong et al. 1983, cited by de Vries).
- Does that make 2 and 4 *true even numbers*?
(25) **Floyd:** Name an even number.

**Clyde:** 806.

**Floyd:** No, a \{ real, true \} even number, like 2 or 4!
An alternative approach:

- appeal to some notion of normality or stereotypical ways things might be
- an intensional approach
- advocated by Constantinescu (2011)
- indirectly, crucial component in McCready & Ogata (2007)
McCready & Ogata (2007), for Japanese *rashii*:

- requires that an individual have more of the stereotypical properties associated with a noun: a *rashii woman* is a stereotypical one
- conditionals of epistemic normality: what is taken to be normal given background knowledge
- $p > q$ iff, whenever $p$, the normal thing would be $p$
- maybe one could frame this using an epistemic modal base and a stereotypical ordering source?
the set of stereotypical properties:

$$\text{stereotypical(woman)} = \left\{ P : \begin{array}{c} \forall x [\text{woman}(x) > P(x)] \land \\
\neg \forall x [\text{woman}(x) \rightarrow P(x)] \end{array} \right\}$$

**rasshi** simply says there are lots of these (literally counts them):

$$[\text{rasshi woman}] = \lambda x : \text{woman}(x).$$

$$|\text{stereotypical(woman)}| > \text{standard}_c(\text{many})$$
Nice feature of this: no need for prototypes:

- a prototype is simply the most stereotypical individual
- nothing requires that there be one

Applying this to real idiot:

\[
(26) \quad \mathbb{L} [\text{rasshi idiot}] = \lambda x : \text{idiot}(x) \cdot \mid \text{stereotypical(idiot)} \mid > \text{standard}_c(\text{many})
\]
But is a *real idiot* actually the most stereotypical idiot or even the best exemplar of idiocy?

Yet another option: *a real idiot* is someone who is an idiot in worlds in which the standards of idiocy are especially stringent.
Roadmap

- Adnominal degree morphemes
- Prototypicality modifiers
  - Dimensions and dimensional modifiers
  - Conclusion
Degree readings of size adjectives and *major* more restricted:

\[
\{ \text{big, huge, major} \} \subseteq \{ \text{disaster, idiot, smoker, basketball fan, #American, #sportscar} \}.
\]

The idea: no degree argument, but certain nouns *are* inherently conceptually associated with scales.
Similar move necessary to reflect polysemy in adjectives:

(28)   a. The US is bigger than Canada.  \(\text{(population)}\)
b. Canada is bigger than the US.  \(\text{(area)}\)

*Big*'s lexical entry must make available multiple dimensions:

(29) \(\text{dimensions(big)} = \{\text{size-by-population, size-by-area, \ldots}\}\)
To be big, it is sufficient to exceed the standard on just one dimension.

Sassoon (2007b, 2013): this depends on the adjective. *Healthy* requires all dimensions, *sick* only one.
Standard assumption about simple adjectives: an unpronounced degree morpheme POS (Cresswell 1976, von Stechow 1984, Kennedy 1997, and many others). Possible implementation:

\[ (30) \quad \lceil \text{POS} \rceil^c = \lambda g \lambda x . \exists D \left[ D \in \text{dimensions}(g) \land \mu(D)(x) \geq \text{standard}_c(D) \right] \]

... where \( \mu(D) \) is the measure function (\( \langle e, d \rangle \)) associated with the dimension \( D \).

\[ (31) \quad \lceil \text{Canada is POS big} \rceil^c = \exists D \left[ D \in \text{dimensions}(\text{big}) \land \mu(D)(x) \geq \text{standard}_c(D) \right] \]
**Dimensions and Dimensional Modifiers:**

**Nouns and Dimensions**

Nouns may specify dimensions too:

(32)  

a. \( \text{dimensions(basketball-fan)} = \) 
\[
\begin{align*}
\text{attention-devoted-to-basketball, } \\
\text{enthusiasm-for-basketball, } \\
\text{knowledge-about-basketball, } \\
\text{frequent-attendance,}
\end{align*}
\]

\[\vdots\]

b. \( \text{dimensions(smoker)} = \) 
\[
\begin{align*}
\text{frequency-of-smoking, } \\
\text{enthusiasm-for-smoking}
\end{align*}
\]

\[\vdots\]
For *chair*, though, it would be hard to articulate dimensions. No salient gradable quality is sufficient to be a chair.

So, `dimensions(chair)` is undefined.
On its degree reading, *big* requires that the measure of an individual along a lexically-determined dimension be large (treating *big* as a degree head, even though it isn’t one):

\[(33)\]

a. \[ [ \text{big}_{\text{Deg}_N} ]^c = \lambda f \lambda x . \exists D \left[ D \in \text{dimensions}(f) \land \text{large}_c(\mu(D)(x)) \right] \]

b. \[ [ \text{Clyde is a big}_{\text{Deg}_N} \text{ smoker} ]^c = \exists D \left[ D \in \text{dimensions(\text{smoker})} \land \text{large}_c(\mu(D)(\text{Clyde})) \right] \]

NB: Still no degree argument for nouns: \[ [ \text{smoker} ] \text{ is } \langle e, t \rangle ; \]
\[ [ \text{big}_{\text{Deg}_N} ] \text{ is } \langle et, et \rangle . \]
How does this ensure that (34a) entails (34b)?

(34)  
   a. Clyde is a big\textsubscript{Deg\textsubscript{N}} smoker.
   
   b. Clyde is an smoker.

It doesn’t. Could add requirement of exceeding standard by a large amount:

(35)  
\[ [\text{Clyde is a big}_{\text{Deg}_N} \text{ smoker}]^c = \exists D \left[ D \in \text{dimensions(smoker)} \land \right. \]
\[ \left. \text{large}_c(\mu(D)(\text{Clyde}) - \text{standard}_c(D)) \right] \]
...but, a more interesting hypothesis:

(36) On their degree readings, nouns have minimal standards.
As with chair, dimensions(sportscar) not defined. Rules out \( \#\text{big}_{\text{Deg}_N}\) sportscar:

\[
(37) \quad \left[ \# \text{This is a big}_{\text{Deg}_N} \text{ sportscar} \right]^c = \exists D \left[ D \in \text{dimensions(sportscar)} \land \right. \\
\left. \text{large}_c(\mu(D)(\text{this})) \right]
\]
Dimensions and Dimensional Modifiers:

Unidimensional Modifiers

More restricted still:

\[
\begin{align*}
\text{utter} & \quad \text{disaster} \\
\text{complete} & \quad \text{idiot} \\
\text{total} & \quad \#\text{smoker} \\
\text{absolute} & \quad \#\text{basketball fan} \\
\text{outright} & \quad \#\text{American} \\
\text{flat-out} & \quad \#\text{sportscar}
\end{align*}
\]

(38)

Similar facts in Japanese. Elsewhere? (Examples welcome.)
What’s special about e.g. *disaster* and *idiot*?

- Being a basketball fan is complicated.
- Being an idiot is simple.
Some nouns specify only one dimension:

(39)  a. $\text{dimensions(idiot)} = \{\text{idiocy}\}$
     b. $\text{dimensions(disaster)} = \{\text{disastrousness}\}$
Utter presupposes that its noun is unidimensional:

(40)  a. $\left[ \text{utter} \right]^c$

    $= \lambda f \lambda x . \text{large}_c(\mu(\nu D[D \in \text{dimensions}(f)])(x))$

b. $\left[ \text{Clyde is an utter idiot} \right]^c$

    $= \text{large}_c(\mu(\nu D[D \in \text{dimensions(idiot)]}))(\text{Clyde})$

    $= \text{large}_c(\mu(\text{idiocy})(\text{Clyde}))$

Requires that the measure of Clyde along the idiocy scale be large.
What goes wrong in \#utter smoker?

- failure of presupposition
- there are multiple dimensions specified by smoker
- so $\nu D[D \in \text{dimensions(smoker)}]$ is undefined
What goes wrong in \#utter\ sportscar? 

- same as in \#big\ sportscar
- failure of presupposition
- there are no dimensions specified by \textit{sportscar}
- so \texttt{dimensions(sportscar)} is undefined
Is it plausible to say that *basketball fan* has multiple dimensions but *sportscar* has none?

This could be simply a lexical stipulation, but it’d be nice to do better.
Sassoon (2007b, 2013):

(41)  a. Floyd is healthy except for his high blood pressure.
     b. Floyd is not sick except for his high blood pressure.

(42)  a. #Tweety is a bird except for the gills.
     b. #Tweety isn’t a bird except for the feathers.

This might be evidence that *bird* is non-dimensional (contra Sassoon).
We should find a contrast with multidimensional nouns. Maybe?

(43) a. Floyd isn’t a smoker except for the occasional cigar.
    b. Floyd isn’t a basketball fan except for his constant betting on games.
Why do so many unidimensional nouns seem suspiciously emotively loaded?

Maybe this isn’t about dimensions but about *expressive meaning*?

(44) Clyde saw a fucking goat.

*suggests:* speaker is agitated
Typical expressive:

(45) Clyde didn’t see a fucking goat.  
{suggests: speaker is agitated}

Compare to:

(46) Clyde didn’t see a(n) \{ idiot, disaster, genius \}.  
{doesn’t suggest: speaker is agitated}
Maybe this isn’t about dimensions or expressive meaning but *extremeness*?

A class of cross-categorial degree modifiers that occur with ‘extreme’ predicates (Morzycki 2012):

\[
\begin{align*}
\text{outright} & \quad \text{huge/\#big} \\
\text{flat-out} & \quad \text{fantastic/\#OK} \\
\text{straight-up} & \quad \text{excessive/\#appropriate} \\
\text{out-and-out} & \\
\text{downright} & 
\end{align*}
\]

(47)

Are unidimensional degree modifiers actually just extreme? Would explain *\#utter heap*. 
Adnominal degree morphemes
Prototypicality modifiers
Dimensions and dimensional modifiers

Conclusion
This motivated a three-way distinction among nouns:

- nondimensional: *sportscar*
- multidimensional: *smoker*
- unidimensional: *idiot*

Any evidence for this outside of degree modifiers?
Exclamatives (Ai Taniguchi, p.c.):

\[(48)\]  

a. What a(n) \[\begin{cases} \text{idiot} \\ \text{smoker} \\ \text{doctor} \end{cases}\] !

b. Boy, is she a(n) \[\begin{cases} \text{idiot} \\ \#?\text{smoker} \\ \#?\text{doctor} \end{cases}\] !

c. Isn’t she a(n) \[\begin{cases} \text{idiot} \\ \#?\text{smoker} \\ \#?\text{doctor} \end{cases}\] ?!
Bigger picture:

- nouns support varied array of degree modifiers
- only indirectly gradable
- some adnominal degree modifiers involve something like prototypicality (*real, true*)
- others involve scales provided lexically but indirectly by the noun
  - some presuppose a single scale (*utter, complete*)
  - others don’t (*big, huge, major*)
major axis of variation among adnominal degree modifiers: how they extract a scale from noun

yields a typology of nouns: nondimensional, multidimensional, unidimensional

So... where does all this leave adjectives?
Thanks!

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For adjectives, scale structure is crucial. How far would that have gotten us here?

- nothing here to suggest that scale structure isn’t important for nouns too
- probably not relevant to presence or absence of a degree argument
- probably not relevant to real/true
- what about big vs utter?
Is this really all about scale structure?

Utterly may require upper-closed scales:

\[
\begin{align*}
(49) & \quad \{ \text{utterly} \} \quad \{ \text{impossible}/\#\text{possible} \} \\
& \quad \{ \text{completely} \} \quad \{ \text{closed}/\#\text{open} \} \\
& \quad \{ \text{absolutely} \} \quad \{ \text{full}/\#\text{empty} \}
\end{align*}
\]

Nominalizations:

\[
\begin{align*}
(50) & \quad \{ \text{utter} \} \quad \{ \text{impossibility}/\#\text{possibility} \} \\
& \quad \{ \text{complete} \} \quad \{ \text{closure}/\#\text{openness} \} \\
& \quad \{ \text{absolute} \} \quad \{ \text{transparency/opacity} \} \\
& \quad \{ \text{fullness/emptiness} \}
\end{align*}
\]
But:

(51)  a. \[
\begin{align*}
\text{utter} & \{ \text{idiot} \} \\
\text{complete} & \{ \text{disaster} \} \\
\text{absolute} & \\
\end{align*}
\]

b. \[
\begin{align*}
\text{utterly} & \{ \text{idiotic} \} \\
\text{completely} & \{ \text{disastrous} \} \\
\text{absolutely} & \\
\end{align*}
\]

So: scale structure remains important, but probably not an account of the contrast.
References


Rotstein, Carmen & Yoad Winter. 2001. ‘Partial adjectives vs. total adjectives: Scale structure and higher-order modification’. In *Proceedings of the Amsterdam Colloquium*.


