The Twofold Nature of Degree Nominalizations*

Degree Concepts and Qualities

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Introduction

Adjectival and nominal gradable properties

English primarily uses **adjectives** to expresses gradable properties, but it can also use **nouns**:

(1) a. Floyd is **strong**.
b. Floyd has **strength**.

We will call these degree nominalizations (DNs)

Adjectival and nominal gradable properties

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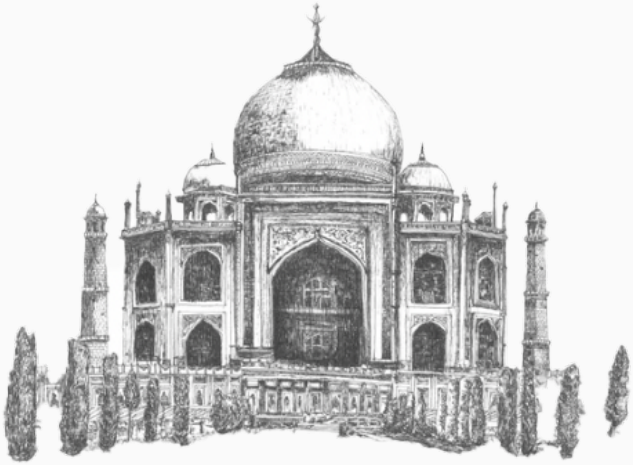
Some languages primarily use **DNs** to express gradability:

(2) Munà **dà** ƙarfī
we.CONT **with strength**
'We **have strength**.'

(3) Yārinyà tana **dà** zōbè
girl she.CONT **with** ring
'The girl **has** a ring.'
(Hausa, Newman 2000)

Possessive degree nominalizations



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Francez & Koontz-Garboden (2017) observe [English] sentences like (4) containing nominals don't give rise to a contradiction:

(4) The Taj Mahal has the same **beauty** as the Stata Center, though their **beauties** are very different. *(≈ FKG 2017)*

- Taj Mahal and Stata Center have the **same degree** of beauty.
- The **substances** of beauty they possess are **distinct**.

A wrinkle in the English data

Not all English DNs fit in FKG's frame without contradiction:

(5) #The Taj Mahal has the same {**height** / **weight** / **size**} as the Stata Center, though their {**heights** / **weights** / **sizes**} are very different.

- Therefore, there are different types of DNs in English
- Not all are accounted for with FKG's substance analysis

Two types of degree nominalizations in English

We distinguish biased DNs and neutral DNs (see also Moltmann 2009):

Biased DNs	Neutral DNs
tallness	height
heaviness	weight
warmth	temperature
youth	age
largeness	size

Preview

Biased and neutral DNs differ with respect to...

- mode of attribution (HAVE vs BE)
- mass/count
- distributional readings
- the ways in which they can be said to change
- factor phrases
- concealed questions

We analyze...

- Biased DNs as qualities—portions of an abstract substance—in the spirit of FKG
- Neutral DNs as degree concepts, intensionalized degrees

The facts

Simple attribution: *have* vs *be*

Neutral DNs, but not biased DNs, can occur with the copula in predication. Biased DNs must use HAVE.

This contrast is seen in simple attribution contexts:

(6) a. Ingo {is / ??has} the same {height / age / weight / size} as Bertha. *(neutral)*

b. Ingo {#is / has} the same {tallness / oldness / heaviness / beauty} as Bertha. *(biased)*

Adjunction to NP

Only neutral DNs can adjoin to NPs:

(7) a. A person that { height / age / weight / size } is bound to make the team.

(neutral)

b. #A person that { tallness / oldness / heaviness / beauty } is bound to make the team.

(biased)

Adjunction to NP and reduced relative clauses

This follows from analyzing this structure with a covert relative clause head and copula (Larson 1985):

(8) a. A person [who is] that height...
b. #A person [who is] that tallness...

This connects the DP adjunct facts to the *have* vs *be* facts.

Mass vs count—*many* and *much*

Neutral DNs can occur with *many*. Biased DNs must occur with *much*:

(9) a. I didn't notice many {heights / ages / weights / sizes}. *(neutral)*

b. I didn't notice much {beauty / strength / wisdom / patience}. *(biased)*

Group nouns and DNs

Singular neutral DNs give rise to collective readings with group nouns:

(10) The {age / size} of the committee intimidated Floyd. *(neutral)*

a. *age*: #The members were all elderly.

b. *size*: #The members were all enormous.

Biased DNs allow a distributive interpretation:

(11) The {oldness / tallness} of the committee intimidated Floyd. *(biased)*

a. *age*: The members were all elderly.

b. *size*: The members were all enormous.

Factor phrase modification

Only neutral DNs have a clear interpretation with factor phrases such as *three times* (Gobeski 2019):

(12) a. Floyd is three times Ingo's { height / age / weight / size }. *(neutral)*

b. ??Floyd has three times Ingo's { tallness / oldness / heaviness / beauty }. *(biased)*

Predicating change

When a neutral DN is said to change, its change is in degrees:

(13) Floyd's height has changed.

a. He's grown a few inches.

b. #He used to be a lanky tall, but now he's bulked up.

When a biased DN is said to change, its change is in the way a property is manifested (cf. Moltmann 2009):

(14) Floyd's tallness has changed.

a. He used to be a lanky tall, but now he's bulked up.

b. He's grown a few inches.

Concealed questions

Concealed questions (Grimshaw 1979 among many others) occur with neutral but not biased DNs (Moltmann 2009):

(15) Floyd guessed Clyde's height. *(concealed question)*
≈ Floyd guessed what Clyde's height was. *(question)*

Concealed questions

(16) a. Clyde knew Ingo's $\left\{\begin{matrix}\text{height}\\\text{weight}\end{matrix}\right\}$. *(neutral)*

$\approx$ Clyde knew what Ingo's $\left\{\begin{matrix}\text{height}\\\text{weight}\end{matrix}\right\}$ was.

b. #Clyde knew Ingo's $\left\{\begin{matrix}\text{tallness}\\\text{heaviness}\end{matrix}\right\}$. *(biased)*

$\not\approx$ Clyde knew what Ingo's $\left\{\begin{matrix}\text{tallness}\\\text{heaviness}\end{matrix}\right\}$ was.

Data summary

	Neutral DNs	Biased DNs
Can be the same and different	✓	✗
Simple predication with copula	✓	✗
Can head DP adjuncts	✓	✗
Pattern as count nouns	✓	✗
Distributive readings	✗	✓
Licit with factor phrases	✓	✗
Can change in quality	✗	✓
Concealed questions	✓	✗

Previous work

Possessive degree nominalizations

Francez & Koontz-Garboden 2015, 2017 (FKG):
Degree nominalizations:

- Denote mass substances
- Require a possessive semantics

A's strength is different from B's strength—even if A and B are equally strong (see also Moltmann 2009).

Francez & Koontz-Garboden (2017)

Under their analysis, a nominal like *strength* is a predicate of portions p.

(17) $[\![\textit{strength}]\!] = \lambda p \,.\, \textbf{strength}(p)$

Also crucial for them is possessive morphology, which when applied to the nominal returns a predicate of individuals:

(18) $[\![\textit{has strength}]\!]^C = \lambda x \,.\, \iota p \in C[\textbf{strength}(p) \wedge \pi(x, p)]$

x possesses a portion of strength z, where z is restricted to "large enough" in the context C.

Adopting FKG

This alone doesn't deliver the grammatical contrasts between Biased DNs and Neutral DNs, such as (19).

(19) The Taj Mahal has the same $\left\{\begin{matrix}\text{beauty}\\\text{height}\end{matrix}\right\}$ as the Stata Center, though their $\left\{\begin{matrix}\text{beauties}\\\#\text{heights}\end{matrix}\right\}$ are very different. *(≈ FKG 17)*

Moltmann (2009)

Moltmann (2009) recognizes the same two classes of nominalizations:

	Moltmann	us
Terminology:	positive nominalizations	biased DNs
	absolute nominalizations	neutral DNs

Her analysis:

- uses tropes *qua* particularized properties of individuals
- both types denote relations between tropes and their bearers
- biased DNs make reference to a standard of comparison (cf. POS in degree-based accounts) —neutral DNs don't

Moltmann (2009)

- Her analysis treats these classes differently, but both of them are of the same semantic type.
- It does not predict the range of grammatical distinctions we observe between the two forms.

(20) a. Ingo {is / ??has} the same {height / age / weight / size} as Bertha. *(neutral)*

b. Ingo {#is / has} the same {tallness / oldness / heaviness / beauty} as Bertha. *(biased)*

Towards an analysis

We adopt FKG's notion of portions of an abstract quality in representing biased DNs.

Furthermore, like Moltmann, we only encode the exceeding of a standard in biased DNs—not neutral DNs.

To encapsulate the full range of grammatical differences between the classes, we treat them as different semantic types.

Analysis

Degrees

The analysis of neutral DNs will build on assumptions about measure phrases.

We interpret MPs as degree-denoting (standardly) and a type-shift allows for their interpretation with the copula:

(21) Ingo is six feet.

(22) a. $[\![\textit{six feet}]\!] = \textsf{6ft}$

b. $[\![\textit{DEG-SHIFT}]\!] = \lambda d \lambda x \,.\, \mu_{\textsf{scale}(d)}(x) \geq d$

c. $[\![\textit{Ingo is DEG-SHIFT six feet}]\!]$

$= [\![\textit{DEG-SHIFT}]\!]([\![\textit{six feet}]\!])([\![\textit{Ingo}]\!])$

$= \mu_{\textsf{scale(6ft)}}(\textsf{Ingo}) \geq \textsf{6ft}$

Neutral DN in predicative contexts

Neutral DNs also can occur predicatively:

(23) Ingo is my height.

We assume the same type-shift is at play here:

(24) a. $[\![\textit{my height}]\!] = \mu_{\textsf{height}}(\textsf{me})$ *(to be revised!)*

b. $[\![\textit{DEG-SHIFT}]\!] = \lambda d \lambda x \,.\, \mu_{\textsf{scale}(d)}(x) \geq d$

c. $[\![\textit{Ingo is DEG-SHIFT my height}]\!]$

$= [\![\textit{DEG-SHIFT}]\!]([\![\textit{my height}]\!])([\![\textit{Ingo}]\!])$

$= \mu_{\textsf{height}}(\textsf{Ingo}) \geq \mu_{\textsf{height}}(\textsf{me})$

Neutral DNs with DP adjuncts and factor phrases

The DEG-SHIFT type shift also explains why neutral DNs like heights and weights occur as DP adjuncts interpreted intersectively:

(25) A player that $\left\{\begin{array}{l}\text{height}\\ \text{weight}\\ \text{size}\end{array}\right\}$ is bound to make the team.

The reason why factor phrases are licit with Neutral DNs is because *three times* applies to *my height* before the DEG-SHIFT:

(26) $[\![\textit{is DEG-SHIFT three times my height}]\!]$
$= \lambda x \,.\, \mu_{\textsf{height}}(x) \geq [3 \times \mu_{\textsf{height}}(\textsf{me})]$

Neutral DNs are intensional

However, there are contexts neutral DNs but not degrees. Predicates of change:

(27) $\left\{\begin{array}{l}\text{My height}\\ \#\text{Six feet}\end{array}\right\}$ changed.

Concealed questions:

(28) Floyd knows $\left\{\begin{array}{l}\text{my height}\\ \#\text{six feet}\end{array}\right\}$.

(cf. Moltmann 2009, Castroviejo Miró & Schwager 2008)

Neutral DNs as degree concepts

Concealed questions are standardly associated with individual concepts (Heim 1979, Romero 2005, Aloni & Roelofsen 2011, Bhadra & Mendia 2019)—e.g., type $\langle s, e \rangle$, where s is a situation.

But since we're dealing with degrees, what we need here are DEGREE CONCEPTS, of type $\langle s, d \rangle$.

Neutral DNs and change predication

The neutral DN is a function from a situation to Bertha's height in the situation:

(29) $[\![\textit{Bertha's height}]\!] = \lambda s \,.\, \mu_{\textsf{height},s}(\textsf{Bertha})$

This makes change predication possible as in (30b):

(30) a. $[\![\textit{changed}]\!] = \lambda\delta_{\langle s,\, d\rangle}\lambda s \,.\, \exists s'[s' \prec_{\textsf{time}} s \wedge \delta(s') \neq \delta(s)]$

b. $[\![\textit{Bertha's height changed}]\!]$

$$= \lambda s \,.\, \exists s' \left[\begin{array}{l} s' \prec_{\textsf{time}} s \wedge \\ \mu_{\textsf{height},s'}(\textsf{Bertha}) \neq \mu_{\textsf{height},s}(\textsf{Bertha}) \end{array}\right]$$

Neutral DNs predicated

How does this work in extensional contexts? Montagovian extensionalizing operator (Montague 1973 among many others):

(31) $[\![{}^{\vee}]\!]^{s} = \lambda\alpha \,.\, \alpha(s)$

This provides a licit input to DEG-SHIFT as in (32):

(32) a. $[\![\textit{Bertha's height}]\!] = \lambda s \,.\, \mu_{\textsf{height},s}(\textsf{Bertha})$

b. $[\![{}^{\vee} \textit{Bertha's height}]\!]^{@} = [\![\textit{Bertha's height}]\!](@)$

$= \mu_{\textsf{height},@}(\textsf{Bertha})$

(33) a. $[\![\textit{DEG-SHIFT}]\!]^{@} = \lambda d \lambda x \,.\, \mu_{\textsf{scale}(d),@}(x) \geq d$

b. $[\![\textit{Ingo is DEG-SHIFT} {}^{\vee} \textit{Bertha's height}]\!]^{@}$

$= [\![\textit{DEG-SHIFT}]\!]^{@} ([\![{}^{\vee} \textit{Bertha's height}]\!]^{@})([\![\textit{Ingo}]\!]^{@})$

$= \mu_{\textsf{height},@}(\textsf{Ingo}) \geq \mu_{\textsf{height},@}(\textsf{Bertha})$

Returning to biased DNs

A biased DN definite description like (34) picks out the maximal contextually salient portion of a quality, here tallness, possessed by an individual, here Esme (π represents possession, following FKG):

(34) $$[\![\, \textit{Esme's tallness} \,]\!]^{C,s} = \iota p \in C\,[\textbf{tallness}(p) \wedge \pi_s(\textbf{Esme}, p)]$$

Mass and count biased DNs

Because biased DNs denote stuff—masses— they require a mass determiner:

(35) I didn't notice much $\left\{\begin{array}{l}\text{tallness}\\ \text{beauty}\\ \text{strength}\end{array}\right\}$.

Multiplying biased DNs

Because biased DNs are simply portions, they are illicit with factor phrases, i.e., cannot be multiplied:

(36) #Floyd is three times Bertha's tallness.

Biased DNs and attribution

Because this is a type of quality, in simple attributions Biased DNs must occur with *have* or a possessive:

(37) #Floyd is Esme's {tallness / strength / beauty}.

A type clash prevents biased DNs from combining with the DEG-SHIFT type shift—and therefore also makes them unable to be intersectively-interpreted adjuncts.

(38) *A player Esme's {tallness / beauty / strength} is bound to make the team.

Possession and kinds

Biased DNs instead use “have” i.e., possession.

(39) Floyd has Esme’s $\left\{\begin{array}{l}\text{tallness}\\ \text{strength}\\ \text{beauty}\end{array}\right\}$.

Possession in general often allows kind readings:

(40) Anton has Eva’s nose.
‘Anton has the same kind of nose as Eva.’

(41) I have Floyd’s car.
‘I have the same kind of car as Floyd.’

(42) $\exists k \left[\begin{array}{l}\iota x[\textbf{nose}(x) \wedge \pi_S(\textbf{Anton}, x)] \text{ realizes } k \wedge\\ \iota y[\textbf{nose}(y) \wedge \pi_S(\textbf{Eva}, y)] \text{ realizes } k\end{array}\right]$

Biased DNs and kind possession

We assume a kind possession strategy for biased DNs.

(43) a. Floyd has Esme's $\left\{\begin{array}{l}\text{tallness}\\ \text{strength}\\ \text{beauty}\end{array}\right\}$.

b. $\exists k \left[\begin{array}{l}\iota p \in C\,[\textbf{tallness}(p) \wedge \pi_s(\textbf{Floyd}, p)] \text{ realizes } k \wedge \\ \iota p' \in C\,[\textbf{tallness}(p') \wedge \pi_s(\textbf{Esme}, p')] \text{ realizes } k\end{array}\right]$

BDNs and change

Change predication is possible for biased DNs:

(44) $[\![\textit{changed}_2]\!] = \lambda P_{\langle s,\, p\rangle} \lambda s \,.\, \exists s' [\, s' <_{\textsf{time}} s \wedge P(s) \neq P(s') \,]$

(45) $[\![\textit{Esme's tallness changed}_2]\!]^C = \lambda s \,.$

$$\exists s' \left[s' <_{\textsf{time}} s \wedge \left[\begin{array}{l} \iota p \in C[\textbf{tallness}(p) \wedge \pi_s(\textbf{Esme}, p)] \neq \\ \iota p' \in C[\textbf{tallness}(p') \wedge \pi_{s'}(\textbf{Esme}, p')] \end{array} \right] \right]$$

Neutral DNs—being degree concepts—can only change in their measure. Biased DNs can change in more abstract ways.

Revisiting the Taj Mahal

(46) The Taj Mahal and Stata Center have the same $\left\{\begin{array}{c}\text{height}\\ \text{beauty}\end{array}\right\}$, but their $\left\{\begin{array}{c}\#\text{heights}\\ \text{beauties}\end{array}\right\}$ are different.

With the neutral DN, (46) is saying that their degrees of height are the same and that their degrees are different, leading to contradiction.

Biased DNs don't work like this, because qualities are more than a measure. They can be the same in some respects, including their degrees, and different in others.

Taking stock

Summary

- The mass-portion analysis of property concepts like wisdom was motivated chiefly by gradable predication across languages.
- We show, though, that even in English, the mass-portion analysis is necessary for some nominalizations, and distinguishes them from others.
- We also show that there are two types of degree nominalizations in English, and that one of them can be construed as denoting degree concepts.

Future directions

- How can the distributivity facts be derived? Why are these facts so?
- How exactly can the ‘ways’ in which one has beauty be formalized?
- What does a ‘kind’ for a property concept mean?
- What are the relevant notions of sameness, difference, and possession?

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