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## Gradability within a Trope-Based Approach

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### 1. The notion of a trope

#### 1.1. Characteristic properties of tropes

##### - instance of a property (a quality – a nonsortal property)

The trope instantiates the property; the object that is the bearer of the trope has the property.

(Aristotle)

Reflection in natural language:

Terms for particulars      terms for kinds

*The man in the garden*      *men*

*The water in the room*      *water*

*Socrates' wisdom*      *wisdom*

*John's happiness*      *happiness*

##### - ontologically dependent of a bearer

A trope exists in a circumstance only if its bearer exists in that circumstance.

Two tropes are distinct if they have distinct bearers.

##### - acts as the object of perception, in fact of immediate perception (prior to the perception of the bearer) (Williams, Campbell, Lowe)

Reflection in natural language:

(1) a. John noted the redness of the apple.

b. John observed Mary's haste.

(2) a. John saw the beauty of the rock formation.

b. ?? John saw (the state of the) the rock formation being beautiful.

Referents of demonstratives in identificational sentences (Moltmann, to appear b):

(3) Did you see that? That might have been Mary.

- acts as argument of causal relations:

(4) a. The heaviness of the bag she was carrying made Mary exhausted.

b. The humidity of the air caused the softness of the wood.

- **enters similarity relations**

Two tropes instantiating the same property / the same natural property are similar / exactly similar.

A common trope-theoretic view:

Properties are classes of similar / exactly similar tropes (Williams, Bacon, Campbell, Simons)

Reflection in natural language:

*Is the same as*: expresses (exact) similarity

(5) a. The softness of the red wool is the same as the softness of the blue wool.

b. ?? The softness of the red wool is the softness of the blue wool

*Is*: expresses numerical identity

- **tropes are maximally specific, determinate, not determinable:**

(6) a. John described Mary's beauty.

b. ?? John described Mary's being beautiful.

- **one trope may necessarily go along with other kinds of tropes**

Trope of color – trope of spatial extension (Husserl)

- **may have a part-whole structure, a measurable extent**

Reflection in natural language:

amount quantifiers:

(7) a. a lot of happiness, little happiness

part quantifiers:

b. some of John's happiness

quantitative comparison:

c. John's happiness exceeds Bill's happiness.

- **spatio-temporal location problematic:**

may have temporal duration:

(8) John's happiness lasted only a year.

No spatial extension or spatial location:

(9) a. ?? the chair's blackness in the room

b. ?? John's heaviness on the table

- **acts as truthmaker (Mulligan/Simons/Smith, Moltmann 2007):**

John's happiness is the thing in the world that makes *John is happy* true.

More problematic:

truth maker of *Socrates is a man*: Socrates, Socrates' humanity?

## 1.2. Kinds of tropes

### trope terms with adjective nominalizations:

medieval philosophers, Strawson (1959), Woltersdorff (1970):

*the redness of the apple, the roundness of the object*

### tropes based on sortal predicates:

*John's fatherhood*

### tropes with abstract bearers

*the roundness of the circle*

### trope terms not derived from adjectives

*the quality of the paper, the shape of the vase, John's smile*

*that feature, that patch of color, that*

### quantitative tropes

*the extent of John's anger*

*John's weight, John's height, the length of the stick*

*the number of planets* (Moltmann, to appear)

(10) a. John's weight is the same as Mary's weight.

b. ?? John's weight is Mary's weight

### relational tropes:

(11) a. the love between John and Mary

b. the personal relation between John and Mary

c. the difference between John and Mary

**higher-order tropes:**

- (12) a. the unexpectedness of the beauty of the landscape  
 b. the unusualness of the lightness of the stone

**higher-order relational tropes:**

- (13) the difference / similarity between the beauty of the picture and the beauty of the landscape

**quasi-relational tropes:**

- (14) a. the relation between John and Mary  
 b. the relatedness of John to Mary  
 c. the way John is related to Mary  
 d. the way John and Mary are related to each other
- (15) a. John's contempt of Mary  
 b. the contempt between John and Mary

**a different kind of thing: qua objects:**

- (16) a. John's fatherhood  
 b. John as a father

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**2. Tropes and the semantics of adjectives**
**2.1. The role of tropes as referents of adjective nominalizations****2.2. Adjectival modifiers as trope predicates**

[1] modifiers making reference to the particular way the property is manifested:

- (17) a. exquisitely / strangely beautiful  
 b. intensely / uniformly / deeply red

[2] modifiers making reference to the perceivability of the trope:

- (18) visibly / perceivably happy

[3] modifiers making reference to the causal (including emotional) effect of a trope:

- (19) a. fatally weak  
 b. exhaustingly long  
 c. deliberately silent

[4] modifiers making reference to the temporal duration of a trope:

- (20) the constantly nervous director

[5] evaluative predicates evaluating a trope (not an abstract degree):

- (21) a. John is remarkably tall.  
 b. The remark was shockingly inadequate.  
 c. The baby is surprisingly ugly.

### 2.3. Parallel with events

- (22) a. John walked quickly.  
 b.  $\exists e(\text{walk}(e, \text{John}) \ \& \ \text{quickly}(e))$
- (23) a. The rose is deeply red.  
 b.  $\exists t(\text{red}(t, \text{the rose}) \ \& \ \text{deeply}(t))$
- (24) a. [*John's quick walk*] =  $\iota e[\text{walk}(e, \text{John}) \ \& \ \text{quick}(e)]$   
 b. [*the rose's deep redness*] =  $\iota t[\text{red}(t, \text{the rose}) \ \& \ \text{deep}(t)]$

Tropes as implicit arguments of adjectives

## 3. The analysis of comparatives and of adjective nominalizations

### 3.1. Nominalizations of gradable adjectives and the semantics of comparatives

Intuitive equivalences:

- (25) a. John is happier than Mary.  
 b. John's happiness exceeds Mary's happiness.
- (26) a. The cellar is darker than the kitchen.  
 b. The darkness of the cellar exceeds the darkness of the kitchen.

The restriction to a single respect:

(26b) cannot be read as:

(27) The darkness of the cellar exceeds the darkness of the kitchen

- because the cellar is larger than the kitchen

- because the cellar has been darker for longer than the kitchen

- because the cellar's darkness is more typical / expected / desired than the darkness of the kitchen.

→ single reading of the *exceed*-predicate with trope-referring terms

No single respect with objects:

(28) John exceeds Mary – in happiness / in height / in tolerance.

The problem of direction:

(29) a. John is stronger than Mary.

b. John's strength exceeds Mary's strength.

(30) a. Mary is weaker than John.

b. Mary's weakness exceeds the weakness of John.

Suppose John is kind of weak and also John is kind of strong.

*John is weak* and *John is strong* have the very same truthmaker, i.e.

John's weakness = John's strength, and so for Mary:

(31) a. John's strength exceeds Mary's strength.

b. Mary's weakness exceeds John's weakness.

c. John's weakness = John's strength.

d. Mary's weakness = Mary's strength.

e. John's weakness exceeds Mary's weakness.

Same behaviour of adjectives of intensity:

(32) a. John's strength is great.

Mary's strength is negligible.

John's strength exceeds Mary's strength.

b. Mary's weakness is great.

John's weakness is negligible.

Mary's weakness exceeds John's weakness.

The problem with the nominalization:

Exceed-relation cannot be read off the referent when conceived as a trope in the standard sense, e.g. as the physical condition in virtue of which John is strong / weak.

Solution:

Nominalization imposes an ordering on the referent that is specified by the adjective itself.

This means that a gradable adjective expresses fundamentally an ordering among tropes.

This is what is picked out by the comparative of the adjective .

The positive has a more derivative meaning.

Content of a gradable adjective divides into a specifications of conditions (tropes) and an ordering among those conditions.

Consequence for vagueness:

The vagueness of adjectival concepts is a result of setting up a one-place property on the basis of a two place relation among tropes.

How to conceive of the referent of a gradable-adjective nominalization?

Composition of standard trope with the relevant ordering with respect to other tropes of the same sort -- but in what way?

Two options:

[1] qua tropes

Observation:

*as*-phrases modifying NPs trigger the same readings of the relevant predicates:

(33) a. John as gymnast exceeds everyone in his class.

b. John as a gymnast is great.

c. John as a financial contributor is negligible.

Mary's weakness: Mary's physical condition qua being a weakness

Mary's strength: Mary's physical condition qua being a strength

John's strength = t qua 'strong',

$t$  qua  $\lambda x[x < t', x < t'', x < t''', t^* < x, t^{**} < x, \dots]$  for the various tropes  $T', t'', t^*, t^{**}$  of the same sort as  $t$ .

John's weakness =  $t$  qua 'weak'

$t$  qua  $\lambda x[x > t', x > t'', \dots]$

[2] quasi-relational trope:

John's strength = John's physical condition together with its relatedness (in the greater-than relation) to physical conditions of the same sort

The sum of  $t$  and the instantiation of  $\lambda x[x < t', x < t'', x < t''', t^* < x, t^{**} < x, \dots]$  in  $t$

C: the relevant operation of composition

(34)  $[John's\ strength]^{w,i} = c(\{t \mid \langle t, John \rangle \in [strong]^{w,i}\} \cup \{r \mid \exists t'(t' \in f(strong)(w, i) \ \& \ r = f(\leq, t, t', w, i) \vee r = f(\leq, t', t, w, i))\})$

Ordering among tropes expressed by adjective includes ordering wrt possible tropes, tropes belonging to different indices:

- (35) a. I thought your yacht was longer than it is.  
b. The cat is bigger now than it was a year ago.

The comparative concept associated with an adjective:

(36) The *comparative concept*  $f(A)$  of an adjective  $A$  is a function from world-time pairs to sets of tropes such that  $(\cup \{T \mid \exists w \in W \exists t \in T \ f(A)(w, t) = T\}, \leq_A)$  is a transitive and reflexive ordering.

Nouns are not associated with comparative concepts, even when able to act as trope-terms:

- (37) a. The straightness of the first rope is greater than / exceeds the straightness of the second rope.  
b. ?? The form of the first rope is greater than / exceeds the form of the second rope.  
c. ?? That feature of the first rope is greater than / exceeds the one of the other rope.

### 3. 2. Positive and neutral nominalizations of adjectives

- (38) a. John's heaviness, John's lightness.



b. John's weight

(39) a. the building's tallness, the building's smallness

b. the building's height

Both nominalizations refer to tropes, possible objects of perception and possible arguments of causal relations:

(40) a. John noticed the building's tallness / the building's height.

b. The building's tallness / height was the cause of Marys distress.

(41) a. John's tallness exist.  $\rightarrow$  John is tall.

b. John's height exists.  $-/\rightarrow$  John is tall.

c. John's smallness exists  $\rightarrow$  John is small.

(42) a. John's heaviness exists.  $\rightarrow$  John is heavy.

b. John's lightness exists.  $\rightarrow$  John is light

c. John's weight exists.  $-/\rightarrow$  John is heavy

(43) a. \* John's tallness is two meters.

b. John's height is two meters.

(44) a. ?? John's tallness has changed.

b. John's height has changed.

(45) a. John's tallness is unusual.

b. John's height is unusual.

Two options for the semantics of positive nominalizations:

[1] denotes qua trope: trope qua exceeding the contextual standard

[2] denotes quasirelational trope: the way the trope exceeds the contextual standard

Problem for [1]:

Qua trope that is John's height qua exceeding the standard allows for degree phrases, predicates of change, as well as the relevant readings of evaluative predicates:

(46) a. ? John's height as something above standard is two meters.

b. ? John's height as something above standard has changed.

c. John's height as something above standard is unusual.

John's tallness better taken as a quasi-relational trope: the instantiation of the property of exceeding the contextual standard in John's height.

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#### 4. Tropes and other categories

characteristic of gradable adjectives: express comparative concepts ordering tropes

- Are adjectives the only categories that express such concepts?
- Do other categories describe tropes?

##### 4.1. Nouns

The common philosophical view about sortals:

- Nouns express sortal concepts (or are phase sortals)

Sortal concepts specify reidentification conditions across time and possible situations

- It is individuals, not tropes that instantiate the properties expressed by nouns (Aristotle, Lowe)

The Aristotelian view:

sortal universals = secondary substances, instantiated not by tropes but by primary substances

Why should that be so?

Sortal concepts are complex modal properties involving application of properties in different situations, at different times

Result:

Nouns do not generally take implicit trope argument,

And thus could not possibly express comparative concepts among tropes

Issues:

1. Uses of nouns in comparatives:

Uncover relational trope concept implicit in the noun (stereotype)

(47) Mary is more of a woman / a child / a worker / professor than Sue.

2. Deadjectival nominalizations:

Nominalization has the function of incorporating comparative concept in the referent:  
fundamentally nonrelational, noncomparative

3. Trope-describing nouns (*feature, form, shape* etc):  
do not go along with inherent ordering among tropes

## 4.2. Verbs

### 4.2.1. Events vs Tropes

Some basic observations:

#### **The multiple-respects property of events:**

- (48) a. John's walk exceeded Mary's walk – in length / in difficulty / in being interesting.  
b. John's eating of the apple exceeded Mary's eating of the apple.

Note also: for events not the same quantity / degree predicates as are used for tropes:

- (49) John's walk was great / enormous / long / endless.

#### **Amount quantifiers with verbs:**

- (50) a. John has laughed too much / a lot  
b. much laughter / a lot of laughter

The same quantifiers possible with certain types of tropes:

- (51) a. lot of happiness / strength / tolerance / darkness / weight  
b. ?? a lot of softness / robustness / tallness / height

#### **Amount comparatives:**

Allow for different verbs:

- (52) a. John has laughed more than he has cried.  
b. John has shouted more than Mary has whispered.  
c. John has run more than he has talked

Ordinary comparatives of adjectives do not allow for different adjectives:

- (53) a. ?? John was more silent than talkative.  
b. # John is happier than he is sad.  
c. John is more happy than sad / happy rather than sad.

But amount comparatives available with nominalizations:

- (54) a. John found more tranquility than stimulation  
 b. John found more happiness than sadness.

Conclusion:

- Events do not represent a single respect, but allow for evaluations in various respects.
- Events, like certain types of tropes, allow for mass quantification and the corresponding amount quantifiers and amount comparatives.

Amounts in both cases individuated on the basis of time, contextual units, intensity, relatively independent of the ordering imposed by the adjective.

**Is there a problem of direction with verbs?**

*weight:*

single direction:

- (55) a. John's weight exceeds Mary's weight.

But *weigh* is neutral:

- b. John weighs more than Mary, but both weigh very little.

For certain kinds of tropes, there is a standard ordering not specified by a concept such as that is expressed by a gradable adjective.

Another case: *height* – an underived trope-expression:

- (56) John's height exceeds Mary's height.

**4.2.2. Tropes as implicit arguments of verbs?**

The range of stative verbs (Maienborn, Rothmayer):

Verbs of body position, posture *sit, stand, lie, sleep*: describe concrete ('Davidsonian') states (or perhaps activities in a relevant sense)

Other verbs describe abstract ('Kimean') states: states that are not objects of perception, are not in space, do not involve a particular manifestation.

Examples: *Be*+ adjective, *know, own, resemble, believe*

**Stative verbs allowing for 'degree' modifiers:**

Verbs of resemblance

- (57) a. John resembles Bill a lot / more than Joe.

b. John resembles Bill in an unusual / striking way.

Emotive verbs

(58) a. John likes / loves / hates / admires / appreciates Mary a lot / very much.

b. John firmly / strongly believes that S.

**Stative verbs not allowing for degree modifiers:**

*Own, know*: describe ‘Kimean’, abstract states

(59) a. John’s love for Mary exceeds Bill’s love for Sue.

b. John’s hatred of Jill exceeds Bill’s hatred of Joe.

(60) a. John’s belief that S is stronger than Bill’s belief that S’.

b. John’s belief that S is stronger than his disbelief that S’.

A problem of direction?

Probably not: no absolute, neutral forms available

‘John’s attitude toward Mary’: un specific, not neutral

‘John’s understanding / accepting that S’: underspecified, not neutral

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