Norm-Relatedness in Degree Constructions

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Abstract

We consider the distribution of norm-related readings with dimensional adjectives across various degree construction in Russian and English and argue that the observed pattern as well as some well-known asymmetries in the use of antonyms in English follow from the assumption that gradable adjectives are ambiguous between the scalar and the vague predicate meaning.

1 Introduction

Bierwisch (1989) introduced the term norm-relatedness to refer to the comparison with a contextually determined standard of the relevant gradable property. This kind of comparison is inherent in positive sentences like (1a) where Jimmy's height is said to lie above the given standard of tallness. It is not obligatory in comparatives like (1b) that normally express direct comparison between two points referred to in the sentence.

(1) a. Jimmy is tall.
b. Tony is taller than Jimmy.

Kennedy (2001) observes that the norm-related comparison in contrast to the direct comparison is a freely available interpretative option and surfaces as the comparison of deviation reading. Bierwisch also concludes that comparison with the norm can be part of the meaning of any degree construction and under certain circumstances it must be. In the latter account, norm-relatedness is treated as a re-interpretation strategy applied in the environments in which the direct comparison reading is impossible, e.g. a cross-polar anomaly example in (2) can only receive a norm-related interpretation.

(2) ??Tony is taller than Gemma is short.
'Tony is further above the standard of tallness than Gemma is below the standard of shortness.'

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Recently, Rett (2008) investigated the link between norm-relatedness[1] and the polarity of the gradable predicate. In the equative, negative polar adjectives (A–) obligatorily trigger the norm-related reading, see (3a), whereas positive polar ones (A+) do not, see (3b). However, from a broader cross-linguistic perspective, the two phenomena are not always related. In Russian, the equative as well as some other degree constructions are norm-related regardless of the polarity of the adjective, compare (3b) and (4).

(3) a. Gemma is as short as Judy.
b. Tony is as tall as Pat.

(4) Катя такая же высокая, как и Лариса.
Katja that emph. tall as also Larissa
'Katja and Larissa are equally tall.'

It is this distribution of norm-relatedness in English and Russian that we will consider in this study. Our findings will reveal some crucial properties of degree constructions in these languages that may shed light on the long-standing puzzles related to the semantics of antonyms and measurement.
The paper is structured as follows: section 2 compares the norm-relatedness patterns in English and Russian and elaborates on the norm-related reading in English to highlight the link between the polarity and norm-relatedness; section 3 compares different approaches to norm-relatedness and sets the stage for the new proposal that is presented in section 4; in section 5 we discuss the consequences and conclude.

2 Data

2.1 Two Patterns of Norm-Relatedness

According to Rett (2008), who adopts a degree-based approach to the semantics of gradation, the cancellability of norm-related inferences in English, except in the positive construction (1a), depends on the polarity of the adjective and the properties of the involved degree operator. She observes that along with the equative, that we considered above, 'how' questions are norm-related too if they feature an A–. For example, the answer to (5a) must make reference to the narrowness norm for desks in the given context, while (5b) is normally a neutral request for the width of the desk.

(5) a. How narrow is the desk?
b. How wide is the desk?

Comparatives, including the 'too' and 'enough' constructions, do not usually display such a switch in the meaning if the polarity of the predicate is reversed. However, as

[1] Rett uses the term evaluativity that is also employed to refer to the properties of non-dimensional adjectives, such as 'happy'. We stick to Bierwish's norm-relatedness to avoid confusion.

observed by Bierwisch (1989) for German in certain subdeletion comparatives only the norm-related reading is available. If the embedded clause of a subdeletion comparative contains an A–, the direct comparison is impossible, regardless of what is in the main clause, see (6a–b). The A– in the subdeletion equatives, be it in the main or in the embedded clause, forces a norm-related interpretation, see (6c–d). The complete pattern is summarised in the table in (6) where the shaded cells represent the unavailability of the direct comparison. According to Bierwisch, if the insertion of a differential measure phrase or a ratio modifier makes a sentence unacceptable, the direct comparison reading is not available and the sentence gets a norm-related interpretation, as illustrated in (6). Note that Bierwisch's measure phrase test is effective for degree questions as well. If (5a) were not norm-related, (7) would be an acceptable answer to it.

(6) a. ??The door is (*2 cm) higher than it is narrow.
b. ?The door is (*2 cm) lower than it is narrow.
c. ?The door is (*twice) as high as it is narrow.
d. The door is (*twice) as low as it is narrow.
e. ?The door is (*twice) as low as it is wide.

A+ er than A+	**as A+ as A+**
A+ er than A–	**as A+ as A–**
A– er than A+	**as A– as A+**
A– er than A–	**as A– as A–**

(7) *The desk is 70 cm narrow.

In Russian, we observe a contrast between the synthetic and the analytical form of the comparative (also reported in Pancheva (2006) among others). The analytical comparative is judged unacceptable in contexts containing the negation of the positive form of the relevant adjective or its antonym, compare (8a) and (8b). Thus, Russian has a different distribution of norm-relatedness: the comparative morpheme on a gradable adjective makes the norm-related inference cancellable. The equatives, too/enough comparatives and superlatives support the observation that the norm related interpretation in Russian is triggered by the lack of degree morphology on an adjective, see (9)–(12).

(8) a. Катя не высокая, но она выше, чем Сергей.
Katja neg tall but she tall-er than Sergej
b. Катя не высокая, *но она более высокая, чем Сергей.
Katja neg tall but she more tall than Sergej
'Katja is not tall, but she is taller than Sergej.'

(9) a. * Катя низкая, она такая/настолько же высокая,
Katja short she that/by that much emph. tall
как/насколько и Лариса.
as/by how much also Larissa
lit.: 'Katja is short, she is as tall as Larissa.'
b. * Катя высокая, она такая/настолько же низкая,
Katja tall she that/by that much emph. short
как/насколько и Лариса.
as/by how much also Larissa
lit.: 'Katja is tall, she is as short as Larissa.'

(10) a. ?? Катя низкая, но достаточно высокая,
Katja short but enough tall
чтоб дотянуться до полки.
to reach to shelf
lit.:'Katja is short but she is tall enough to reach the shelf.'

b. ?? Катя высокая, но достаточно низкая,
Katja tall but enough short
чтоб носить это платье.
to wear this dress
lit.: 'Katja is tall but she is short enough to wear this dress.'

(11) a. ?? Катя низкая, но слишком высокая,
Katja short but too tall
чтоб уместиться на диване.
to fit on sofa
lit.: 'Katja is short but she is too tall to fit on the sofa.'

b. ?? Катя высокая, но слишком низкая,
Katja tall but too short
чтоб носить это платье.
to wear this dress
lit.: 'Katja is tall but she is too short to wear this dress.'

(12) a. ?? Все три брата низкие.
all three brothers short
Коля самый высокий из них.
Kolja most tall from them
lit.: 'The three brothers are short. Kolja is the tallest among them.'

b. ?? Все три брата высокие.
all three brothers tall
Коля самый низкий из них.
Kola most short from them
lit.: 'The three brothers are tall. Kolja is the shortest among them.'

(13) a. Насколько стол широкий?
by how much desk wide

b. Насколько стол узкий?
by how much desk narrow
lit.: 'How wide/narrow is the desk?'

The degree questions in (13) require a norm-related proposition as an answer, similarly to (5a). Neither (13b) nor (13a) can be used as a request for the width of the desk, they rather inquire about the comparison class or the relation to the contextual norm. Thus, an appropriate answer to (13a) would be 'It is fairly wide' or 'It is wide for the desks in our department.'

Considering what we saw above, subdeletion examples that contain a morphologically unmarked form of the adjective in the embedded clause are expected to express comparison of deviation only. Indeed, the subdeletion equative in (14) does not compare the width and the length of the bed directly. It can be true if the bed is longer than it is wide, but, say, looks out of place due to its extreme wideness rather than its length.

(14) Эта кровать не настолько длинная,
this bed neg by that much long
насколько широкая.
by how much wide
'This bed is not as long as it is wide.'

In compliance with Bierwisch's test, measure phrases can occur only in the synthetic comparative in Russian since it does not require the norm-related interpretation in contrast to the analytical comparative, compare (15a) and (15b). Bierwisch's test also correctly rules out the cases of the measure phrase modification of non-comparative adjectives in Russian, see (16).

(15) a. Кровать на 4 см/ в 2 раза шире, чем диван.
bed by 4 cm twice wide-ER than sofa
b. * Кровать на 4 см/ в 2 раза более широкая, чем диван.
bed by 4 cm twice more wide than sofa
'The bed is 4 cm wider than the sofa./The bed is twice as wide as the sofa.'

(16) Кровать 80 см *широкая/ *узкая/ шириной.
bed 80 cm wide narrow width-instr
'The bed is 80 cm wide.'

To conclude, two factors are responsible for whether a degree construction has a direct comparison interpretation or must be re-interpreted and make reference to the relevant contextual norm. First, in English, this is partly determined by the polarity of the predicate. In comparatives the overt instances of A– in the embedded clause trigger re-interpretation. In the equatives the direct comparison is incompatible with the overt A– in general. A– in the 'how' questions also lead to norm-related readings. The second factor is at work in Russian where the norm-related interpretation is triggered by the lack of degree morphology on an adjective.

2.2 Norm-Relatedness and Antonymy

The constructions that we discussed in the previous section in connection with the norm-relatedness in English are often argued to show that A– are marked with respect to their A+ counterparts. Measure phrase constructions, 'how' questions, equatives with ratio modifiers and embedded clauses of subdeletion comparatives are the environments in which A+ and A– show a different behaviour. In these cases negative po-

lar adjectives result in deviancy, see (17a) and (17c), unless the sentences can receive a norm-related interpretation as in (17b) and (17d).

(17) a. The desk is 70 cm wide/*narrow.
b. How wide/narrow is the desk?
c. The desk is twice as wide/*narrow as the doorway.
d. The doorway is higher/lower than the desk is wide/??narrow.

Rullmann (1995) notes that this asymmetry is hard to explain in a degree-based theory if one makes the common sense assumption that the degrees of an A– are identical to the degrees of its antonymous A+. Since degrees are standardly defined as equivalence classes of individuals, see Cresswell (1976), the equivalence of antonymous degrees means that they refer to the same equivalence classes. This assumption is crucial for deriving the equivalence in (18), which Rullmann speaks of as the minimal adequacy requirement for any theory of antonymy.

(18) Katja is taller than Larissa. ⇔Larissa is shorter than Katja.

The task of deriving (18) while accounting for the markedness of A– demonstrated in (17) drove Kennedy (1997) to introduce a sortal distinction between the two types of degrees. He suggests that antonymous degrees (extents) refer to different segments of the same scale. An A+ maps an entity to an initial interval on the relevant scale called the positive extent. The corresponding A– returns the final interval whose lower bound is shared by the positive extent. By adopting this distinction one can indeed come up with satisfactory explanations for the restricted distribution of A–, see Kennedy (2001), von Stechow (1984a). However, this kind of approach faces difficulties with the cases where one cannot appeal to the asymmetry of the poles on the one hand, see (19), and where this asymmetry does not lead to unacceptability on the other, see (20).

(19) a. The desk is (*4 cm) lower than it is narrow.
b. The desk is as narrow as the doorway.
c. How narrow is the desk?

(20) The doorway is lower than the desk is wide.

By denying any link between polarity and norm-relatedness, extent-based theories fail to predict that (19a)–(19c) are impossible on the direct comparison interpretation and that the differential measure phrases are bad in subdeletion comparatives like (19a). Those analyses therefore have to resort to ad hoc stipulations to account for the norm-related inference, see Kennedy (2001, pp. 44–51). No less stipulatory are the existing explanations of the cross-polar nomaly in (20), see Büring (2007), Heim (2008).
We suggest a switch in the perspective in the hope of getting around some loose ends: we claim that the restricted distribution of A– is due to the norm-related inference. Before discussing this claim in more detail, let us consider the different approaches to analysing norm-relatedness.

3 Sources of Norm-Relatedness

Depending on the ontological assumptions, we can distinguish two approaches to analysing norm-relatedness. To derive the meaning of (1a), scalar theories usually need to assume a silent operator that performs the comparison to the contextual standard in the form of a free variable over degrees, von Stechow (1984b). In the "vague predicate" theories norm-relatedness stems from the meaning of gradable adjectives, Klein (1980). In this section, we will consider the two strategies and see that both have difficulties accounting for the data that we discussed above. Section 4 will be a synthesis of the two points of view.

3.1 Vague Predicates

According to Klein (1980) and other "vague predicate" analyses of comparative constructions, gradable adjectives denote partial functions from individuals to truth values. Applied to a context, they partition their domain into the positive extension, the negative extension and the extension gap. Thus, in a simple case, like (1a), the relation of Jimmy's height to the standard of tallness in a given context is determined by 'tall' that specifies who counts as tall in the context.

(21) $[\![\text{tall}]\!] = \lambda c\, \lambda x\, 1$ if $x \in pos_{tall}(c)$, 0 if $x \in neg_{tall}(c)$ and undefined otherwise,
where $pos_{tall}(c) = \{u: u \text{ is tall in } c\}$ and $neg_{tall}(c) = \{u: u \text{ is not tall in } c\}$

Gradable adjectives can be modified by various degree adverbs that denote a family of degree functions specifying how exactly partitioning is to be done. Thus, measure modifiers make vague predicates precise in that they turn them into properties holding of entities of the particular size, e.g. 'six foot' maps 'tall' to a set of entities that are equal in length to 6 foot (the sixth element of the standard sequence based on foot), see Klein (1980, p. 28). Other modifiers, such as 'very', 'fairly', 'extremely', do not eliminate the extension gap as numerical modifiers but shift the boundary of the positive extension in a lexically specified way. For example, 'very' turns 'tall' into a new vague predicate that is like the original one except for the contextual comparison class with respect to which it is evaluated. The comparison class is set to the positive extension of 'tall' in the given context, see (22).

(22) a. For any context *c*: *c*[*X*] is that context *c′* just like *c* except that the comparison class in *c′* is *X*.
b. $[\![\text{very}]\!] = \lambda c\, \lambda K_{c(et)}\, \lambda x\, K(c[X])(x)$, where $X = \{u: K(c)(u) = 1\}$
Klein (1980, p. 42)

The comparative and the equative introduce quantification over degree functions and like numerical modifiers remove reference to the norm in the given context. For example, the comparative maps the vague predicate 'tall' in (1b) to a new predicate that is

true of Tony iff there is at least one degree function that makes 'tall' true of Tony and false of Jimmy. The equative is a universal quantifier over degree functions.
Though successful and simple in accounting for the meaning of positive sentences and sentences with vague degree adverbs, this approach as it stands does not explain the norm-related readings of the comparative or the equative. However, the theory is technically equipped enough to offer us a means for deriving such readings. One such way is mentioned by van Rooij (2008, fn. 9), where he proposes to introduce a new class of operators that quantify over a restricted set of degree functions. For example, (1b) can be analysed as in (23a), according to which both Tony and Jimmy are tall in *c*.

(23) a. □f □ F* [f(⟦ tall⟧)(c)(Tony) ∧ ((NEG(f)(⟦ tall⟧))(c)(Jimmy)]
b. F* = {f: (f(⟦ tall⟧))(c) ⊆ ⟦ tall⟧ (c)}
c. NEG = λf λP λc (⟦ tall⟧ (c) − (f(⟦ tall⟧))(c))

However, this proposal does not address the distribution of the norm-related readings. In general, a vague predicate analysis as developed in Klein neither can explain why the polarity of an adjective may be decisive in this respect nor can it offer any explanation for the contrast between Russian and English with respect to norm-relatedness. Another problem is the ban on numerical modifiers under the norm-related interpretation. If differential measure phrases can be integrated into this kind of analysis, see Klein (1991), there is nothing in the theory that would prevent their occurrence in the norm-related cases. The same can be said about the ratio modifiers in the equative and the contrast in (17a).

3.2 Degrees

Degree theories assume that gradable adjectives make use of scales formed from abstract entities called degrees. Degrees are usually defined in the style of Cresswell (1976) as equivalence classes of individuals, see (24). The ontology is enriched to include the semantic type of degrees and the denotation domain of this type, (25a-b).

(24) a. Let $\succ_{tall}$ be the empirically given relation "taller than" and $F(>_{tall})$ its field.
x_e, y_e □ $F(\succ_{tall})$: $y =_{tall} x$ iff
z_e □ $F(\succ_{tall})$: $[y \succ_{tall} z$ iff $x \succ_{tall} z] \wedge [z \succ_{tall} y$ iff $z \succ_{tall} x]$
b. A 'tallness' degree:
$[u]_{tall} \subseteq D_e =: \{x_e: \ y_e \neq x \wedge y$ □ $[u]_{tall} \rightarrow y =_{tall} x\}$
c. Ordering on 'tallness' degrees:
Let D_{tall} be the set of tallness degrees.
d, d′ □ D_{tall} : $d >_{tall} d'$ iff x □ d, y □ d′ $x \succ_{tall} y$

(25) a. Let *d* be the semantic type of degrees.
b. Let D_d consist of disjoint sets of degrees of various sorts.
c. Call each pair ⟨ X, ≻⟩ , s.t. $X \subseteq D_d$ and ≻ is the ordering on X, a scale.

One of the ways to conceive predicates like 'tall' and 'short' in a degree approach is as relations between individuals and degrees that use measure functions of the respective sort. A measure function maps an individual to its equivalence class based on some property, e.g. HEIGHT defined in (26c) maps an individual to its height.

(26) a. $[\![\text{tall}]\!] = \lambda d_d \, F(>_{\text{tall}}) \, \lambda x_e \, \text{HEIGHT}(x) = d$
b. $[\![\text{short}]\!] = \lambda d_d \, F(>_{\text{short}}) \, \lambda x_e \, \text{HEIGHT}(x) = d$[2]
c. $\text{HEIGHT} = \lambda x. \, \iota d: d \in D_{\text{tall}} \wedge x \in d$

In this setup, in the LFs of (1a-b) it is assumed that the degree morphemes bind the degree argument of 'tall' and express the relevant type of comparison. The comparative turns the gradable predicate A into a relation that maps a degree *d* to a property that holds of *x* if *x*'s degree of A-ness exceeds *d*, see (27a). The positive does not take a degree argument but receives the standard-of-comparison value from the context, (27b). The analysis of (1b) is sketched in (28a-b). The embedded clause is assumed to express a definite degree description.

(27) a. $[\![\text{COMP}]\!] = \lambda A_{d(et)} \, \lambda d_d \, \exists F(>_R) \, \lambda x_e \quad \iota d'(A(d')(x)) >_R d$
b. $[\![\text{POS}_C]\!] = \lambda A_{d(et)} \, \lambda x_e \quad \iota d'(A(d')(x)) >_R g(C)$

(28) a. Tony [[COMP taller] [DEF λd Jimmy d tall]]
b. HEIGHT(Tony) $>_{\text{tall}}$ HEIGHT(Jimmy)

If we pursue this approach to comparatives, the interpretation of subdeletion examples like (29a) is not so straightforward. The two degrees that are to be compared here form different scales and cannot be directly related to each other. This kind of comparatives could be analysed as involving an additional step, namely, that of mapping the resulting degrees to real numbers. Let NUM be a function that maps a unit of measurement and a degree to the real number that corresponds to the number of times the unit must be concatenated with itself to form the abstract object representing the degree. We can now define a number-relating comparative morpheme that is applied if the conventional one in (27) fails to compare the two degrees, see (29c-e).

(29) a. The desk is higher than the door is wide.
b. HEIGHT(the desk) $>_?$ WIDTH(the door) (undefined!)
c. $[\![\text{COMP}^{\text{num}}]\!] = \lambda A \, \lambda n \, \lambda x \, \text{NUM}(u)(\iota d'A(d')(x)) >_R n$,
where $>_R$ is '>' or '<' ordering on real numbers[3].
d. the desk [[COMP$^{\text{num}}$ higher] [NUM λd the door d wide]]
e. NUM(u)(HEIGHT(the desk)) > NUM(u)(WIDTH(the door))

[2] We presuppose that the equivalence classes base on the relations $\succ_{\text{tall}}$ and $\succ_{\text{short}}$ are identical and therefore the degrees of tallness are not distinguishable from the degrees of shortness, hence the use of the same measure function in the defintion of 'tall' and 'short'.
[3] We make the assumption that '<' is employed to compare two numbers if the adjective argument of the number-relating comparative operator is an A–.

NUM would then also be at work in the interpretation of measure phrases. Differential measure phrases like 'by 5 cm' in (30a) specify the distance between the numbers that NUM maps each of the compared degrees and the measure unit to, see (30b-c). The measure phrase '1.80 m' in (31a) has a different function. It points to a degree of the appropriate type that is directly fed into the adjective meaning to yield a statement about Jimmy's height. Let us assume that the mapping of a number and a unit to a degree is performed by the operator EQ as shown in (31b-c).

(30) a. Tony is taller than Jimmy by 5 cm.
b. $[\![\text{ by 5 cm}]\!] = \lambda R\, \lambda A_{d(et)}\, \lambda d_d\, \lambda x_e\, R(A)(d)(x) \wedge \text{DIFF}(d, \iota\, d'(A(d')(x)), \text{cm}) = 5$
c. $d, d' \in D_d, : \text{DIFF}(d, d', u) = |\text{NUM}(u)(d) - \text{NUM}(u)(d')|$

(31) a. Jimmy is 1.80 m tall.
b. Jimmy [[EQ 1.80 m] tall]
c. $[\![\text{ EQ 1.80 meter}]\!] = \iota\, d(\text{NUM}(\text{meter})(d) = 1.80)$

The equative sentence in (32) can be assumed to have the same structure as the measure phrase construction in (31a) except that the degree argument of 'tall' is not created by the EQ operator from a number and a unit but is referentially linked to the correlative phrase. In many languages, including Russian, the correlate in the main clause may surface as a pronoun, e.g. in (4).

(32) Tony is as tall as Pat.

Interestingly, this analysis when applied to the English data we discussed in section 2 makes the obligatorily norm-related environments look distinct from the ones where this inference can be cancelled. Their distinct characteristic is that in they do not distinguish truth-conditionally between the sentences with A+ and A–. This observation was first made in Rett (2008) for 'how' questions and equatives. Indeed, under the assumption that antonymous degrees refer to the same equivalence classes, see footnote 2, the equative in (33) and the 'how' question in (34) end up having the same extension in the A+ and the A– case.

(33) a. The desk is as wide/narrow as the doorway.
b. WIDTH(the desk) = WIDTH(the doorway)

(34) a. How wide/narrow is the desk?
b. $\{p: \exists d\, p = \lambda w\, \text{WIDTH}(\text{the desk}) = d\}$

Note that the measure phrase construction and the subdeletion comparatives, repeated in (35) and (36), reveal this property too. In the subdeletion case, we are forced to apply the number-relating comparative. This renders the pairs in (36a) and (36c) differing only in the polarity of the embedded predicate truth-conditionally equivalent.

(35) a. The desk is 70 cm wide/*narrow.
b. WIDTH(the desk) = $\iota\, d(\text{NUM}(\text{cm})(d) = 70)$

(36) a. The doorway is higher than the desk is wide/??narrow.
b. NUM(u)(HEIGHT(the doorway)) > NUM(u)(WIDTH(the desk))
c. The doorway is lower than the desk is wide/narrow.
d. NUM(u)(HEIGHT(the doorway)) < NUM(u)(WIDTH(the desk))

One can follow the strategy developed in Rett (2008) and assume that the process of semantic competition between the marked A– and unmarked A+ forces us in these cases to parse the sentences with A– as involving a positive morpheme that she calls EVAL and defines as an optional degree modifier. For example, in (37) EVAL would restrict the degree set it attaches to include only degrees that exceed the contextual standard for narrowness. As a result, the answer to (37a) has to be norm-related.

(37) a. How narrow is the desk?
b. how ? [EVAL [λd the dest d narrow]]
c. {p: □d p = λw WIDTH(the desk) = d & d > g(C)}

However, this approach does not attempt and, for that matter, cannot give us an answer to the question why measure phrases are incompatible with the norm-related interpretation. What is worse it makes an absurd prediction that the measure phrase construction is optionally norm-related and therefore (31a) can be false if Jimmy's height, 1.80 m, does not exceed the contextual standard of tallness, cf. (38).

(38) HEIGHT(Jimmy) = ι d(NUM(meter)(d) = 1.80) & d > g(C)

In general, degree based theories are inept to handle the norm-related comparison. According to the standard approach, pursued in Bierwisch (1989) and taken up in Kennedy (1997), norm-related comparatives or comparatives of deviation relate the degrees of deviation from the contextual norm(s). It is clear that such deviation degrees can be only obtained by applying the distance function to two numbers, which is exactly what we want to avoid in order to account for the ban on numerical expressions in the norm-related contexts.

4 Proposal

We want to make use of the obvious advantage of the degree analysis outlined in section 3.2, namely its ability to distinguish the obligatorily norm-related environments from the others. At the same time, we do not want to inherit its problems in dealing with measure modifiers in the norm-related contexts. This brings us to the lexical ambiguity hypothesis. Let us assume that gradable adjectives are ambiguous between the vague predicate and the scalar meaning. The vague predicate meaning is responsible for the norm-relatedness. The analysis of numerical expressions is based on degrees as proposed in 3.2 and so they are allowed to occur only in the scalar meaning contexts. It remains to spell out the factors that determine when which meaning is selected.

4.1 Degree Morphology: The Case of Russian

The empirical pattern that we observe in Russian, see section 2.1, suggests that the choice of the scalar meaning for a gradable adjective is triggered by the comparative morphology. We propose the following rule for Russian:

(39) The scalar meaning of a gradable predicate must be licensed by the degree morphology.

The consequence of (39) is that all comparative constructions in Russian, except for the synthetic comparative, employ the vague predicate meanings of gradable adjectives. We are faced with deriving the norm-related interpretations in the vague predicate approach. We propose that the correlate 'такая'/'that' in the main clause of a Russian equative construction, e.g. in (4), does not refer to a degree but to a degree function, see (40b). Recall that the expressions denoting degree functions now exclude the numerical modifiers that neutralise norm-relatedness. Since the role of degree functions is to fix the comparison class parameter in a given context, (40a) can serve as a paraphrase for the meaning of (4) under this analysis.

(40) a. Katja is tall with respect to the same comparison class with respect to which Larissa is tall.
b. $\iota f\,(f(\llbracket \text{tall} \rrbracket)(c)(\text{Katja})) = \iota f\,(f(\llbracket \text{tall} \rrbracket)(c)(\text{Larissa}))$

One prediction of the analysis in (40) is that (4) can be truthfully uttered in a situation in which Katja's and Larissa's heights are not equal. (4) is predicted to only convey that Katja and Larissa are both tall with respect to the same standard of tallness. The inappropriateness of B's remark in (41) indicates that this is indeed the case.

(41)

A:	Катя	довольно	высокая.	Она	еще	выше	Ларисы.
	Katja	rather	tall	she	even	tall-er	Larissa
B:	*Она	не	выше,	а	такая	же	высокая.
	she	neg	tall-er	but	that	emph.	tall

'A: Katja is rather tall. She is even taller than Larissa.
B: She is not taller but as tall as Larissa.'

While the equative construction involves a reference to a degree function, the analytic comparative expresses comparison of degree functions. To implement this idea we need to define an ordering on degree functions. Assume that vague degree adverbs form a natural scale of the kind shown in (42). The comparative in (8b) repeated below as (43a) does not compare the degrees of tallness as its synthetic counterpart in (8a) but the degree functions that specify the comparison class with respect to which the subject and the object are asserted to be tall (43b-c).

(42) somewhat < … < very < … < extremely

(43) a. Катя более высокая, чем Сергей.
Katja more tall than Sergej
b. Katja [[COMP tall] [DEF λf Sergej f tall]]
c. ι f(f(⟦ tall⟧ (c)(Katja)) > ι f(f(⟦ tall⟧ (c)(Katja))

For other norm-related constructions like the superlative in (12) and the intensional comparison constructions in (10)–(11) we need to specify the interpretation of their degree adverbs. Roughly, the superlative 'самый'/'most' that also uses the lexical scale in (42) requires that the degree function that makes the adjective true of the subject is ranked higher than the degree functions that make other individual in the given comparison class true of the adjective. The intensional adverbs 'слишком'/'too' and 'достаточно'/'enough' restricts the comparison class to include only those individuals that make the modalised statement of the embedded clause false and true respectively. In (10a), the extension of 'достаточно высокая'/'tall enough' in the given context is the set of individuals who are tall and can reach the shelf.
To sum up, Russian does not exploit the scalar meaning of gradable adjectives unless they are morphologically marked for comparison. We proposed to pursue a Klein's style approach to interpret the indirect comparison constructions and showed that their meaning can be derived by manipulating the comparison classes.

4.2 Semantic Competition: The Case of English

In contrast to Russian, resolving the ambiguity of an English adjective does not depend on the degree morphology but on its polarity. We believe that the markedness of A– with respect to their A+ counterparts and the process of semantic competition are at stake here. If assume that A– are marked[4] the process of semantic competition can be described as follows:

(44) If two degree constructions X(A–) and X(A+) are truth-conditionally equivalent and the speaker utters the marked X(A–) then she had a reason to do so, namely to employ the meaning of A– that renders X(A–) and X(A+) non-synonymous.

This line of reasoning as well as the fact that NUM is defined on degrees and cannot be applied to vague predicates accounts for the subdeletion paradigm we considered above. Recall that the comparative fails to relate two degrees if they are the values of different measure functions. The number-relating comparative can remove the problem by mapping the resulting degrees to the real numbers. This is what happens in (45a) and (45c). If the embedded clause features a marked A– as in (45b) and (45d) the rea-

[4] This assumption can most probably get independent empirical support from language acquisition or processing.

soning in (44) can be applied since these two examples come out equivalent with (45a) and (45c) respectively as we showed in (36). As a result, the vague predicate meaning is selected and only the indirect comparison analysis along the lines we outlined in the previous section is possible. The reduced acceptability of these examples, as noted in Bierwisch (1989), corresponds to the fact that the assignment of the norm-related reading is a kind of re-interpretation strategy.

(45) a. The doorway is higher than the desk is wide.
b. ??The doorway is higher than the desk is narrow.
c. ?The doorway is lower than the desk is wide.
d. ?The doorway is lower than the desk is narrow.

Another welcome prediction of our proposal is the unacceptability of ratio modifiers with A– equatives and the A– measure phrase construction in (35). Assuming 'twice' has the semantics in (46), it cannot apply in (33) where the scalar meaning of A– is banned. For the same reason, EQ is undefined in the A– variant of (35). The subdeletion equatives in (47) require the accommodation to numbers step. Obviously, the insertion of NUM is blocked in the process of semantic competition if one of the adjectives is A–.

(46) $[\![\text{twice}]\!] = \lambda d\ \iota\ d'\ (2\ *\text{NUM}(u)(d) = d')$

(47) The desk is twice as wide/*narrow as the doorway is high/*low.

To conclude, the assumption that A– are marked and enter the process of semantic competition with their positive pole counterparts correctly predicts the distribution of direct comparison readings and measure phrases in English.

5 Conclusion

We propose that gradable predicates are lexically ambiguous. Norm-relatedness is the result of preferring the vague predicate meaning of a gradable predicate to the scalar one. In English, the polarity of the adjective and the process of semantic competition govern the selection of the meaning. In Russian, only degree morphology can license the scalar meaning. This strategy has proved successful in explaining some puzzling and so far unresolved asymmetries in the distribution of antonyms and handling the cross-linguistic variation in the distribution of norm-relatedness. The two patterns that we observe in Russian and English do not have to be exhaustive. We would expect languages to vary in how often and under which conditions they employ the scalar meaning.

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