

MEASURE FOR MEASURE
FDSL 10, Leipzig, December 5-7, 2013

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1. INTRODUCTION

Franks 1994, 1995, Neidle 1988, Pesetsky 1982, etc.: cardinal-containing NPs in Russian can fail to trigger agreement on the verb:

- (1) a. Pjat' krasivyx devušek prišli.
five beautiful-GEN.PL girls-GEN.PL **arrived-PL**
Five beautiful girls arrived.
- b. Prišlo pjat' krasivyx devušek.
arrived-NSG five beautiful-GEN.PL girls-GEN.PL
There arrived five beautiful girls.

[The word order indicated is the preferred one, both options are possible for both patterns.]

Possible analyses:

- agreeing and non-agreeing NPs have different internal syntax (DPs vs. QPs, e.g., Pereltsvaig 2006b)
- agreeing and non-agreeing NPs have different external syntax (in [Spec, TP] vs. in [Spec, vP], e.g., Stepanov 2001)

Pesetsky 1982 and Franks 1994 adopt both hypotheses at once.

Explored here is the hypothesis that **numeral NPs can denote degrees**

The categorial status and landing site of non-agreeing numeral NPs is secondary.

2. EVIDENCE FOR DEGREE DENOTATION OF NPs IN RUSSIAN

It is relatively unquestionable that NPs can denote degrees (see Schwarzschild 2005, 2006 for some discussion):

- (2) a. tri litra vodki pseudo-partitive
three liter-PAUC vodka-GEN
three liters of vodka
- b. dlinnee na pjat' metrov differential
longer on five meter-GEN.PL
five meters longer

NPs not containing measure nouns can appear in the same environments:

- (3) a. My vypili tri butylki vodki pseudo-partitive
we drank three-ACC=-NOM bottle-PAUC vodka-GEN
We drank three bottles of vodka.
- b. Èta serija na pjat' knig dlinnee. differential
this series on five books-GEN longer
This series is five books longer.

Syntactic identification of degree-denoting NPs:

- failure to trigger plural marking (the topic of this talk)
- **syntactic inanimacy**

2.1. Background: the category of animacy in Russian

Russian exhibits accusative syncretism for masculine nouns ending in a consonant (a.k.a. the second declension class) and all plurals: animate nouns are marked with surface genitive case and inanimate nouns are marked with surface nominative case:

- (4) a. uvidet' London/Lenina
 see-INF London-ACC=NOM/Lenin-ACC=GEN
to see London/Lenin
- b. uvidet' tri čexla/trěx čelovek
 see-INF three-ACC=NOM cover-PAUC/three-ACC=GEN persons-ACC=GEN
to see three people/covers

In the standard case the surface case of the so-called paucal cardinals depends on the animacy of the lexical noun

2.2. Quantity readings

Mel'čuk 1980a, b: numeral NPs whose nominal head is lexically specified as [animate] can behave as inanimate after certain accusative-assigning prepositions in "quantity" readings:

- (5) a. siloj rovno v **tri medvedja** Mel'čuk 1980b
 strength-INS exactly in three-ACC=NOM bear-PAUC
as strong as exactly three bears
- b. bol'se na **dva mal'čika**
 more on two-ACC=NOM boy-PAUC
two boys more
- c. [Apel'siny končilis'] za **četyre čeloveka** [do menja].
 oranges finished for four-ACC =NOM person-PAUC until me
Oranges ran out four people before my turn.
- d. [stojal v očeredi] čerez **četyre čeloveka** [ot menja]
 stood in queue across four-ACC =NOM person-PAUC from me
He was standing in the queue four people away from me.
- e. po **troe bol'nyx** [v palatu]
 over three.COLL-ACC =NOM patients-GEN in ward
three patients per ward
- f. **dve ženy** tomu nazad
 two-F-ACC =NOM wives-GEN DEM-DAT back
two wives back

Vinogradov 1952:369: numeral NPs headed by nouns denoting animals or the noun *suščestvo* 'creature' can optionally behave as inanimates:

- (6) pojmal tri rybki/ trěx rybok
 caught three-ACC=NOM fish-PAUC three-ACC=GEN fish-GEN.PL
caught three fish/three fishes

Actually, the optionality exists for all animate nouns:

- (7) a. Ja sosčital četyrěx soldat. Franks 1995:104, animate pattern
 I counted four-ACC=GEN soldier-GEN.PL
I counted four soldiers.
- b. Ja sosčital četyre soldata. inanimate pattern
 I counted four-ACC= NOM soldier-PAUC
I counted four soldiers.

Hypothesis: lexically animate numeral NPs functioning as inanimates denote degrees

Confirmation: difference in interpretation: nominative doesn't imply existence

2.3. Summary

The syntax of numeral non-measure NPs in "quantity" readings is that of inanimate NPs

Their semantics is strongly reminiscent of that of measure NPs

Lacking an alternative explanation, we hypothesize that **a numeral NP can denote a degree**.

Question: are degree-denoting numeral NPs restricted to these readily identifiable contexts?

3. NON-AGREEING NUMERAL NPs

Pereltsvaig 2006b identifies a number of **properties of non-agreeing numeral NPs** (8)-(17). NPs containing vague numerals such as *malo* 'few' pattern with numeral NPs, whereas other weak indefinites, like *kakie-to* 'some', do not.

Another shared property of vague numerals and true cardinals is assigning case to their sister, which strongly suggests that unlike the cardinal *one*, they function as heads, as well as their disjoint behavior in direct and oblique case positions

3.1. Non-individuated interpretation

The semantic intuition behind the non-individuated interpretation is difficult to express:

- (8) Rol' Džejsma Bonda ispolnjali /#ispolnjalo [pjat' izvestnyx aktërov].
 role James Bond-GEN performed-PL/# -NSG five famous actors
Five famous actors performed the role of James Bond.

A non-agreeing subject must be interpreted as participating in the event as a whole, yet the NP cannot be interpreted as a group (Pesetsky 1982:85):

- (9) a. Šest' matematikov razlucilis' na mostu.
 six mathematicians parted.company-PL on bridge
Six mathematicians parted company on the bridge.
 b. #Šest' matematikov razlucilos' na mostu.
 six mathematicians parted.company-NSG on bridge
Six mathematicians have separated (from someone else) on the bridge.

The non-agreeing numeral NP subject can only give rise to the non-collective interpretation with an elided second participant argument, showing that it is interpreted distributively.

Problem: group nouns are also not that felicitous in this environment:

- c. #Gruppa matematikov razlucilas' na mostu.
 group mathematicians parted.company-FSG on bridge
A group of mathematicians have separated (from someone else) on the bridge.

Trying the same with a more conventional collective predicate is highly revealing:

- (10) a. Šest' matematikov podnjali pianino.
 six mathematician-GEN.PL lifted-PL piano
Six mathematicians lifted the piano (separately or together).
 b. ??Šest' matematikov podnjalo pianino.
 six mathematician-GEN.PL lifted-NSG piano
All in all six mathematicians managed in the end to lift the piano.

If non-agreeing numeral NPs denote degrees, they clearly do not denote pluralities or groups and thus cannot combine with collective predicates unless denoting a measure of some sort

3.2. Lack of specific or referential interpretation

Specificity-forcing adjectives in the numeral NP trigger obligatory subject agreement:

- (11) V Mariinskom teatre tancevali/*tancevalo [opredelënnye pjat' balerin].
 in Mariinsky theater danced-PL/*-NSG certain five ballerinas-GEN
A certain five ballerinas danced in the Mariinsky Theater.

A numeral NP referring to a subset of a previously introduced set likewise has to agree:

- (12) V naš gorod {priexala gruppa balerin / priexali baleriny} iz Peterburga.
 in our town came group ballerinas-GEN/came ballerinas from Petersburg
 (A group of) ballerinas from St. Petersburg came to our town.
- a. Vo včerašnem koncerte tancevali [pjatero iz nix].
 in yesterday's concert danced-PL five from them
 Five of them danced in yesterday's concert.
- b. *Vo včerašnem koncerte tancevalo [pjatero iz nix].
 in yesterday's concert danced-NSG five from them

Pereltsvaig 2006b proposes that agreeing numeral NPs are categorially DPs and therefore can be referential, while non-agreeing numeral NPs are categorially QPs.

Under the assumption that, not being generalized quantifiers, numeral NPs obtain non-surface scope only by being referential, **obligatory surface scope** is predicted:

- (13) a. Každyj raz [pjat' xirurgov] operirovali Bonda. ✓∀>5, ✓5>∀
 every time five surgeons operated-PL Bond
 Every time five surgeons operated on Bond.
- b. Každyj raz [pjat' xirurgov] operirovalo Bonda. ✓∀>5, *5>∀
 every time five surgeons operated-NSG Bond
 Every time five surgeons operated on Bond.

Pereltsvaig does not detail what semantic type non-agreeing numeral NPs have

If non-agreeing numeral NPs denote degrees, then they are clearly non-referential, correctly predicting (11)-(12)

The obligatory surface scope is predicted by the Heim-Kennedy generalization:

- (14) **Heim-Kennedy generalization** (Heim 2000 on the basis of Kennedy 1999):
 If the scope of a quantificational DP contains the trace of a degree operator, it also contains that degree operator itself.

The Heim-Kennedy generalization does not rule out scoping over negation:

- (15) a. I must be a horrible teacher. Even if a thousand people register for a course, −20
 na ěkzamen ne prixodit bolee 20 studentov.
 on exam NEG come-PRES-3SG mo-er 20 students-GEN
 At the exam there are never more than 20 students.
- b. Never schedule an exam just before Christmas. For any course 20 −
 na ěkzamen ne prixodit bolee 20 studentov.
 on exam NEG come-PRES-3SG mo-er 20 students-GEN
 More than 20 students fail to come to the exam.

The sentence-final position of the numeral NP is compatible with its right extraposition to a landing site from where it c-commands negation. However, post-verbal numeral NP subjects cannot outscope quantifiers except with a very marked "bridge" intonation placing contrastive topic stress on the quantifier and forcing it to reconstruct:

- (16) Esli registriruet'sja 50 studentov, každyj raz opazdyvaet bolee desjati.
 if register-NSG 50 student-GEN.PL every time be.late-NSG more ten-GEN
 If 50 students register, more than ten are late every time.

This suggests that overt movement is not to blame.

3.3. Pronominalization

As observed by Pereltsvaig 2006b, non-agreeing numeral NPs can be replaced by *skol'ko* 'how much/many' and *stol'ko* 'that much/many'; no other pronominal element is possible:

(17) pronominalization

- a. [Oni] tancevali / *tancevalo tango.
 they danced-PL/*-NSG tango
They danced tango.
- b. Emu [stol'ko] ne nužno / *nužny.
 he-DAT that-much not needed-NSG/*-PL
He doesn't need that much.

Extending assumption that non-agreeing numeral NPs can denote degrees to vague numerals *malo* 'little/few' and *mnogo* 'much/many' and their wh- and demonstrative counterparts above is supported by their declension patterns: like cardinal numerals, they assign genitive case to the lexical NP in direct case positions and agree with the lexical NP in oblique case positions (cf. Babby 1985, 1987):

- (18) a. Ja znaju šest' / mnogo / neskol'ko učenyx.
 I know-1SG six-ACC=NOM/many-ACC=NOM several-ACC=NOM scientists-GEN
I know six/many/several scientists.
- b. Ja znakoma s šest'ju/so mnogimi / s neskol'kimi učenyimi.
 I familiar-F with six-INS with many-INS.PL with several-INS.PL scientists-INS
I am familiar with six/many/several scientists.

Adger 1996: measure phrases (i.e., unambiguous degrees) cannot be DPs (cf. (17))

Therefore, pronouns, including PRO, (generally) cannot have a degree interpretation

Non-agreeing numeral NPs **cannot control PRO**:

- (19) [Pjat' banditov]_i pytalis' /*pytalos' [PRO_i ubit' Džemsa Bonda].
 five thugs-GEN tried-PL/*-NSG to.kill James Bond
Five thugs tried to kill James Bond.

Non-agreeing numeral NPs **cannot bind independent reflexives and reciprocals**:

- (20) [Pjat' banditov] prikryvali /*prikryvalo sebja ot pul' Džejmsa Bonda.
 five thugs-GEN shielded-PL/*-NSG self from bullets James Bond
Five thugs shielded themselves from James Bond's bullets.

Proposal: it's because pronouns cannot denote degrees.

3.4. Approximation

Approximative inversion (see Billings 1995, Fowler 1987, Franks 1994, 1995, Isakadze 1998, Mel'čuk 1985, Pereltsvaig 2006a, b, Yadroff and Billings 1998, Zaroukian 2012) consists of the reversal of the normal linear order between a cardinal and a noun, with the resulting effect of speaker uncertainty (see Pereltsvaig 2006a for details):

- (21) a. tri časA
 three hour-PAUC
three hours
- b. časA tri
 hour-PAUC three
about three hours

Approximative Inversion in the numeral NP subject **blocks verbal agreement** (Yadroff and Billings 1998):

Except when the NP in question has the existence presupposition, e.g., *èti čelovek dvadcat'* (attested)

- (22) V ètom restorane obedalo/*obedali [čelovek desjat']. Pereltsvaig 2006b
 in this restaurant dined-NSG/*-PL person-PL-GEN ten
In this restaurant dined approximately ten people.

Assuming that delimitation, approximation and precision are defined for degrees, but not for individuals or predicates, predicts default verbal agreement with Approximative Inversion, as well as with other quantity modifiers, such as *vsego* 'all in all' and *rovno* 'exactly':

- (23) *Vsego pribylo/*pribyli sorok pisem.*
 all-GEN arrived-NSG/*-PL forty letters-GEN
All in all, there arrived 40 letters.

Pereltsvaig 2006b also notes that the approximative prepositions *okolo* 'around' and *s* 'off', as well as classifier-like elements in the numeral NP subjects allow plural agreement on the verb only very marginally, as expected.

Importantly, approximative inversion with lexically animate nouns requires inanimate case-marking (Franks 1995:167):

- (24) a. *Ja videl soldata cetyre.*
 I saw soldier-GEN.PL four-ACC.PL=NOM.PL
I saw about four soldiers.
 b. **Ja videl soldat cetyrëx.*
 I saw soldier-ACC.PL=GEN.PL four-ACC.PL=GEN.PL

It seems unquestionable that indefinite degree-denoting NPs cannot trigger plural agreement

3.5. Summary

The hypothesis that non-agreeing numeral NPs do not denote entities explains why they can be **neither referential nor specific**.

The hypothesis that non-agreeing numeral NPs denote degrees explains why they **undergo approximative inversion**, are interpreted as **non-individuated**, **fail to pronominalize** and **cannot outscope quantifiers**.

We have suggested that **syntax allows us to diagnose degree-denoting numeral NPs**, for which we have also provided **independent evidence from semantics**.

We will now show that **the two diagnostics coincide**.

4. MEASURE NPs

Claim: the properties collected by Pereltsvaig characterize degree-denoting NPs, which are not limited to numeral NPs but include also **pseudo-partitives**

4.1. Accumulative direct objects

Pereltsvaig 2006b: direct objects appearing with the **accumulative verbal prefix** *na-* show the same properties as non-agreeing subjects:

- (25) a. *Papa nasobiral dve korziny gribov.*
 daddy ACM-collected two.F-ACC=NOM basket-PAUC mushroom-GEN.PL
Daddy has gathered two baskets of mushrooms.
 b. *Džejms Bond nakopiroval [džužinu čertežj].* Pereltsvaig 2006b
 James Bond ACM-copied dozen-ACC blueprints-GEN
James Bond copied a (whopping) dozen blueprints.

Obligatory non-individuation: verbs that select individuated objects are incompatible with the accumulative prefix *na-*:

- (26) **Džejms Bond naljubil [krasivyx ženščin].*
 James Bond ACM-loved beautiful women
 intended: *James Bond loved many beautiful women.*

Non-referentiality: strong determiners and specificity-inducing adjectives are incompatible with the accumulative prefix *na-*:

- (27) Džejms Bond nasobiral [(*)opredelěnnuju) oxapku cvetov].
 James Bond ACM-picked particular armful flowers-GEN
James Bond picked an armful of flowers.

Non-partitivity: (28b) cannot be taken as the continuation of (28a):

- (28) a. Deti vymyli vse griby...
 children washed all mushrooms-ACC
The children washed all the mushrooms...
 b. #a potom papa našinkoval korzinu gribov.
 and then daddy ACM-chopped basket-ACC mushrooms-GEN
*and then Daddy chopped a whole basket of (*the) mushrooms.*

Note: intuitively, when the direct object of the accumulative verb here represents the product of the activity (i.e., when the accumulative verb functions as a creation verb), it cannot be presupposed to exist. As we will see, it is also possible for the direct object of an accumulative verb to be the input to the activity in question, which renders the degree reading far less likely

Lack of non-isomorphic wide scope:

- (29) Každyj agent nakopiroval [džužinu čertežej]. ∀ > 12, *12 > ∀
 every agent ACM-copied dozen-ACC blueprints-GEN
Every agent copied a (whopping) dozen blueprints.

Inability to control PRO:

- (30) a. Džejms Bond_j priglasił [džužinu krasotok]_k [PRO_{*j/k} vypit' po martini].
 James Bond invited dozen-ACC babes-GEN drink-INF DIST-P Martini
James Bond invited dozen babes to drink a Martini apiece.
 b. Džejms Bond_j napriglašal [džužinu krasotok]_k [PRO_{*j/*k/√j+k} vypit' po martini].
 James Bond ACM-invited dozen-ACC babes-GEN drink-INF DIST-P Martini
James Bond invited to drink a martini apiece with him a whopping dozen babes.

Note: The availability of **partial control** (cf. Landau 1999, 2004, Martin 1996), not noted by Pereltsvaig, shows that a further qualification of this constraint is needed

The **inability to bind free-standing reflexives** cannot (yet) be verified: Russian reflexives are strictly subject-oriented. While Pereltsvaig claims that accumulative direct objects cannot bind reciprocals, counterexamples are available.

Approximative inversion is likewise possible:

- (31) Každyj raz v knižnom magazine ja nabiraju [knig desjat']. ∀ > 10, *10 > ∀
 every time in book store I ACM-pick-1SG books-GEN ten
Every time I go to a book store, I pick a pile of about 10 books.

Pereltsvaig 2006b suggests that accumulative direct objects, like non-agreeing NP subjects, are "small nominals", i.e., QPs without a DP layer.

However, accumulative direct objects include bare partitives (26), vague measure partitives (28) and numerical nouns (30), in addition to numeral NPs (31)

Hypothesizing that the latter two are QPs requires that vague measures and numerical nouns be lexically ambiguous between nouns and quantifiers.

All these putatively degree-denoting NPs allow default agreement in the subject position

4.2. Agreement in (pseudo-) partitives

Graudina et al. 1976: partitives can give rise to three agreement patterns:

Syntactic agreement: the head of the partitive is a lexical noun with its core meaning (*series*):

- (32) V izmenenijax pravil dopuščen rjad nedostatkov.
in changes rules-GEN allow-PPT-MSG series.M drawbacks-GEN
A series of drawbacks was allowed in the changes of the rules.

Plural agreement: the head is interpreted as 'a number of', with no ordering

Note: Graudina et al. 1976 assert that passive past participles cannot take plural agreement, but counterexamples can be found on Google

- (33) Rjad žirondistskix oratorov prodolžali настаivat' na neprikosnovennosti korolja.
series [Girondist orators]-GEN continued-PL insist-INF on inviolability king-GEN
A number of Girondist orators continued to insist on the inviolability of the king.

Default agreement (neuter singular): considered substandard; the head is likewise interpreted as 'a number of':

- (34) Bylo namečeno rjad konkretnyx voprosov.
was-NSG sketch-PPT-NSG series [concrete questions]-GEN
There was sketched a series of concrete questions.

The plural and the default agreement correlate with the interpretation of the head noun *rjad* as denoting a certain, limited quantity, rather than a limited ordered set.

In other words, agreement distinguishes a true partitive (32) from pseudo-partitives (33), (34)

In English this three-way distinction is obscured by the lack of lexical gender, resulting in the otherwise puzzling plural agreement patterns:

- singular for partitives; plural for pseudo-partitives: Akmajian and Lehrer 1976, Dodge and Wright 2002, among others
- singular for measure expressions; plural for individuals: Gawron 1995, Solt 2007

Note: the formation of pseudo-partitives is not restricted to container nouns

Conclusion: pseudo-partitives have precisely the same agreement options as numeral NPs

4.3. Passivization of accumulative verbs

If accumulative verbs only combine with degrees, when passivized they are predicted to give rise to default agreement only

In fact, all three options are possible, but with clearly distinct truth-conditions, showing that accumulative verbs only combine with degrees when they represent the measure of the event

4.3.1. The real partitive: syntactic agreement

Syntactic agreement with the number and the gender of the head:

- (35) Vsego byla nafotografirovana džužina/?tysjača/*pjat' vidov.
all-in-all was-FSG ACM-photograph-PPT-FSG dozen.F/thousand.F/five landscapes-GEN
Overall, a dozen/thousand of landscapes was photographed in abundance.

⇒ This is a real partitive:

- gender agreement with a numeral is impossible for independent reasons
- the subject is interpreted as the input to the photocopying activity (a pre-existing object), to which the activity was **distributively** applied to a great degree

Going back to the prior examples shows that they also have this interpretation

4.3.2. Degree interpretation: default agreement

With a numerical noun or vague measure head this corresponds to pseudo-partitive:

- (36) Vsego bylo nafotografirano ?džužina/tysjača/pjat' vidov.
 all-in-all was-NSG ACM-photograph-PPT-NSG dozen.F/thousand.F/five landscapes-GEN
Overall, a whopping five/dozen/thousand landscapes was photographed.

⇒ This is the true degree interpretation of the subject:

- it's slightly marked with pseudo-partitives, but perfect with numerals
- the subject is generally interpreted as the output of the photographing activity; it can only be interpreted as its input if we're measuring the extent of the activity by how much its input was

4.3.3. Individuated interpretation: plural agreement

Once again, plural agreement requires the subject to be interpreted as the input to the activity

- (37) Vsego byli nafotografirany džužina/tysjača/pjat' čertežej.
 all-in-all was-PL ACM-photograph-PPT-PL dozen.F/thousand.F/five landscapes-GEN
Overall, a dozen/thousand/five landscapes were photographed in abundance.

The predicate is interpreted distributively; the abundance is about the activity, not the input

If the source interpretation is excluded by the pragmatics of the predicate, plural agreement becomes ungrammatical (many thanks to Masha Polinsky for the suggestion and examples):

- (38) a. Vsego u nix bylo nažito tysjača rublej.
 all-in-all at them was-NSG ACM-live-PPT-NSG thousand.F rubles-GEN
Overall, they had saved a thousand rubles.
- b. #Vsego u nix byla nažita tysjača rublej.
 all-in-all at them was-FSG ACM-live-PPT-FSG thousand.F rubles-GEN
Overall, they had saved a thousand of rubles.
- c. *Vsego u nix byli nažity tysjača rublej.
 all-in-all at them was-PL ACM-live-PPT-PL thousand.F rubles-GEN

Note: (38b,c) are acceptable to the extent that a pre-existing thousand rubles can be viewed as a result of saving

A similar effect can be achieved with the sequential/repetitive prefix *pere-*:

- (39) a. Xuntoj bylo perevešano tysjača povstancev.
 junta-INS was-NSG SEQ-hang-PPT-NSG thousand.F rebels-GEN
There was a thousand rebels hanged by the junta one by one.
- b. ?Xuntoj byla perevešana tysjača povstancev.
 junta-INS was-FSG SEQ-hang-PPT-FSG thousand.F rebels-GEN
A/? the thousand of rebels was hanged by the junta one by one.
- c. #Xuntoj byli perevešany tysjača povstancev.
 junta-INS was-PL SEQ-hang-PPT-PL thousand.F rebels-GEN
A thousand rebels was re-hung by the junta.

Summary: when the subject, be it the underlying internal argument or the external argument of the verb, expresses the measure to which the predicate holds, it triggers default agreement

5. SUMMARY

Independent evidence for the availability of degree denotation for NPs:

- direct objects of accumulative verbs: quantity-denoting expressions; share all the semantic properties of non-agreeing NP subjects; when passivized, require default agreement (except if the verb meaning is shifted); pseudo-partitives behave just like numeral NPs
- lexically animate numeral NP complements of prepositions specifying quantity

Crucially, both of these environments **semantically select** for measure-denoting NPs.

For the differential argument of the comparative in (5b) degree denotation is required by the standard semantic treatments of comparatives. In other words, independent factors necessitate that numeral NPs can denote degrees.

The scopal behavior of measure-denoting NPs matches that of degrees, up to and including the Heim-Kennedy generalization for modals

Degree denotation of NPs not headed by measure nouns has also been proposed by Ionin and Matushansky 2012, Matushansky and Ionin 2011 for a type of nominal comparatives

A proposal that NPs can denote degrees is also explored in Krifka 1990:

(40) *Four thousand ships passed through the lock.*

Event-oriented quantification may fail to entail the existence of 4000 ships. Agreement in the Russian counterpart clearly distinguishes the two readings:

- (41) a. 4000 korablej prošli čerez šljuz. individual ships only
 4000 ships passed-PL through lock
 4000 ships passed through the lock.
- b. 4000 korablej prošlo čerez šljuz. no commitment
 4000 ships passed-NSG through lock
 4000 ships passed through the lock.

That adjectives are ungrammatical with the default agreement (Neidle 1988:208) may be due to the fact that they lack an event argument, though stative verbs are fine.

6. QUESTIONS FOR FUTURE RESEARCH

Rullmann 1995, Carston 1998, Kennedy 2010: **numerals under modals can have at least, at most or exactly readings**:

- (42) a. In Britain, you have to be 18 to drive a car. minimal
 b. Once you have your degree, you can have a salary of \$100,000 a year.
- (43) a. She can have 2000 calories without putting on weight. maximal
 b. You may attend six courses per semester.

Oda 2008, Beck 2009: **exactly-NPs can have an at least reading** under modals:

- (44) You are allowed to write exactly 5 pages.
 a. writing exactly 5 pages is permitted (but you can write more than that, too)
 b. the maximum you are allowed to write is exactly 5 pages

Hackl 2000: **comparative numerals** interact with intensional predicates:

- (45) John is required to read **fewer than 6 books**.
 a. the number of books that John reads is not allowed to exceed 5
 b. the minimal number of books that John should read is less than 6

If numeral NPs can denote degrees, their behavior under modals is expected

Heim 2000: **comparative ambiguity** under modals:

- (46) The draft is 10 pages long. The paper is required to be exactly 5 pages longer than that.
 a. the paper cannot be longer or shorter than 15 pages
 b. the minimal length of the paper is 15 pages; it can also be longer than that
- (47) The draft is 10 pages long. The paper is allowed to be less long than that.
 a. it is possible for the paper to be shorter than the draft
 b. it is required that the paper be shorter than the draft

Comparative ambiguity under modals has been shown using (a) **numeral NP differentials**, which can themselves denote degrees and (b) downward-entailing comparatives of inferiority (*less than*)

Research hypothesis: all instances of comparative ambiguity under modals involves QR of degree-denoting NPs rather than QR of the comparative morpheme.

If correct, this hypothesis will allow us to get rid of the syntactically dubious mechanism of QR of the comparative morpheme.

Further extension: can all downward-entailing "determiners" (*few, little, less than five*, etc.) have **degree denotation only**?

7. BIBLIOGRAPHY

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