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4000 MEASURE NPS: ANOTHER PASS THROUGH THE ШЛЮЗ

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Утром Путин без затей
Слопал четверо детей *(Internet meme)*

1. THE STRUCTURE OF THE TALK

Russian provides a number of syntactic diagnostics distinguishing two types of numeral NPs:
- lack of animacy with lexically animate nouns (Mel'čuk 1980a, b, 1985)
- default verbal agreement

Claim: both are sensitive to degree denotation

Event-oriented readings pattern with numeral NPs clearly denoting degrees:
- differentials in various constructions
- internal arguments of accumulative verbs
- approximative inversion

This syntactically uniform class exhibits several semantic properties characteristic of degrees and cannot be demonstrated to contain anything other than degrees

Given that NPs not headed by measure nouns can be shown to be able to denote degrees, the most economic solution is obvious

The compositional semantics of degrees in argument positions is borrowed from Krifka 1990

The default predicate agreement is shown to result from the failure of formal (syntactic) and semantic agreement mechanisms

2. EVIDENCE FOR DEGREE DENOTATION OF NPS IN RUSSIAN

It is relatively undisputed that NPs can denote degrees (but see Schwarzschild 2005, 2006):

(1) a. tri litra vodki — measure 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 (on measure pseudo-partitives see also Rothstein 2009, Partee and Borschev 2012):

(2) a. My vypili tremja butylkami vodki bol'še. — instrumental differential
we drank three-INS bottle-INS vodka-GEN more
We drank three bottles of vodka more.

b. Èta serija na pjat' knig dlinnee. — prepositional differential
this series on five books-GEN longer
This series is five books longer.

c. My vypili pol-butylki šampanskogo. — measure pseudo-partitive
we drank half-bottle-ACC champagne-GEN
We drank half a bottle of champagne.

Standard view: lexico-semantic shift in the meaning of the noun:

(3) ⟦glass⟧ = λnλPλx [P(x) ∧ MEAS(x) = <n,GLASSFUL>] — Landman 2004

(4) a. $[\![\text{glass}]\!]_{\langle e, \langle e, t\rangle\rangle} = \lambda y.\lambda x\ [\text{glass(es)}(x) \ \&\ \exists z\ [z \subseteq y\ \&\ z \text{ fills } x]]$ Partee and Borschev 2012
b. $[\![\text{glass}]\!]_{\langle n, \langle e, t\rangle\rangle} = \lambda n.\lambda x[\text{glass}(y_i)\ \&\ x \text{ would fill } y_i \text{ n times}]$,
where y_i is a context-dependent variable

(3) does not make explicit the meaning shift itself, so (4), incorporating something alike the productive English *-ful* suffix, as in *truckful*, *spoonful*, *bowlful*, etc., is preferable

Syntactic identification of degree-denoting NPs:
- syntactic inanimacy
- failure to trigger plural marking

Reasoning: from measure NPs to derived measures

3. DEGREE DENOTATION AND ANIMACY

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:

(5) a. uvidet' London/Lenina
see-INF London-ACC=NOM/Lenin-ACC=GEN
to see London/Lenin

b. uvidet' tri čexla/trëx čelovek
see-INF three-ACC=NOM cover-PAUC/three-ACC=GEN persons-ACC=GEN
to see three people/covers

In numeral NPs the case is realized on the cardinal. While on the higher cardinals accusative is always realized as nominative, on paucal cardinals it surfaces as genitive if the lexical noun is animate

3.1. Clear degree contexts

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:

(6) 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'še 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

In all these cases the numeral NP in question does not denote concrete individuals but rather a certain amount expressed in the terms of nonstandard measures

3.2. Accumulation

Accumulative verbs, discussed by Pereltsvaig 2006b, take as their direct objects amounts or measures, which can syntactically correspond to pseudo-partitive or numeral NPs:

(7) 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 [djužinu čertežej].
James Bond ACM-copied dozen-ACC blueprints-GEN
James Bond copied a (whopping) dozen blueprints.

When the direct object is a numeral NP headed by a lexically animate noun, the inanimate case-marking pattern is possible:

(8) a. Ja nasčital četyrëx soldat. animate pattern
I ACM-counted four-ACC=GEN soldier-GEN.PL
I counted four soldiers. (There were at least four soldiers that I counted.)

b. Ja nasčital četyre soldata. inanimate pattern
I ACM-counted four-ACC=NOM soldier-PAUC
I counted four soldiers. (I counted off four soldiers.)

Intuition: the animate case-marking implies preexistence

Confirmation: accumulative verbs can (but do not have to) be creation verbs (which may fail to give rise to a new object):

(9) a. ?Ja nafotografirovala četyrëx zelënyx čelovečkov.
I ACM-photographed four-ACC=GEN green-PL-GEN man-DIM-PL-GEN
I took a lot of photographs of four little green men.

b. Ja nafotografirovala četyre zelënyx čelovečka.
I ACM-photographed four-ACC=NOM green-PL-GEN man-DIM-PAUC
I took a lot of photographs and the outcome was four little green men.

NB: it is not the case that in all creation uses the direct object is a measure of the event:

(10) Skul'ptor slepil četyrëx zelënyx čelovečkov/*četyre zelënyx čelovečka.
sculptor molded four-ACC=GEN green men/four-ACC=NOM green men
The sculptor molded four little green men.

The default use of accumulative verbs is where the direct object is the measure of the event. In this use numeral NPs headed by a lexically animate noun may behave as inanimates.

3.3. Approximative inversion

Approximative inversion (Mel'čuk 1985, Fowler 1987, Franks 1994, Billings 1995, Franks 1995, Isakadze 1998, Yadroff and Billings 1998, Pereltsvaig 2006a, b, Zaroukian 2012, Matushansky 2013, Rothstein and Khrizman 2013) consists of the reversal of the normal linear order between a cardinal and a noun, with the resulting effect of imprecision or speaker uncertainty as to the exact amount:

(11) a. tri časA
three hour-PAUC
three hours

b. časA tri
hour-PAUC three
about three hours

The NP that has undergone approximative inversion denotes an amount rather than an entity (individuals are not subject to approximation)

Matushansky 2013, Rothstein and Khrizman 2013: the fronted noun is obligatorily a measure noun, lexically or as a result of coercion:

(12) rabočix sorok pjat'
worker-GEN.PL forty five
about 45 workers

Approximative inversion also requires inanimate case-marking (Franks 1995:167):

(13) 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

For further diagnostics see Matushansky 2013, Rothstein and Khrizman 2013

3.4. Working hypothesis

We have identified three environments where numeral NPs headed by non-measure nouns can be argued to denote degrees on semantic grounds:

- differentials and quantity prepositions
- direct objects of accumulative verbs
- approximative inversion

In each case the putative degree denotation correlates with the obligatorily inanimate pattern of accusative case-marking

Vinogradov 1952:369: numeral NPs headed by nouns denoting animals can also decline as inanimates (see also Franks 1995:104, Mikaelian 2013):

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

Difference in interpretation: nominative implies pre-existence:

(15) a. Kak pojmaju tri rybki, pojdëm. [that number of fish]
how catch-1SG three-ACC=NOM fish-PAUC go-1PL
We'll go as soon as I have caught three fish.

b. Kak pojmaju trëx rybok, pojdëm. individual fishes
how catch-1SG three-ACC=GEN fish-PAUC go-1PL
We'll go as soon as I have caught (the) three fishes.

Hypothesis: lexically animate numeral NPs functioning as inanimates always denote degrees, though in some cases it will be difficult to determine that such is the case (Mikaelian 2013)

Since degrees are not animate, it is unsurprising that the entire numeral NP behaves as if it is inanimate

Question: can the inanimate accusative case-marking pattern for numeral NPs track a broader semantic class than degrees?

Answer: it could, but **there is no independent evidence for a broader class**

4. DEGREE DENOTATION AND DEFAULT AGREEMENT

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

(16) 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.]

Such optionally agreeing NPs are headed by:

- cardinals higher than one (the cardinal *one* is adjectival, always agreeing with the head noun in phi-features and requiring predicate agreement in the same features)
- vague numerals such as *malo* 'few' (but not other weak indefinite adjectives, like *kakie-to* 'some')
- quantity nouns, like *rjad* 'series', *para* 'couple', *kuča* 'heap', etc.

All these elements assign genitive case to their sister, which strongly suggests that unlike the cardinal *one*, they function as heads. Vague numerals and true cardinals also exhibit disjoint behavior in direct and oblique case positions (Babby 1985, 1986)

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.

Matushansky and Ruys 2013: **default agreement correlates with the degree denotation**

4.1. Default agreement and semantically motivated degrees

Rothstein and Khrizman 2013: measure nouns require default agreement:

(17) Prošlo/*prošli pjat' let.
passed-NSG/PL five years
Five years passed.

Unsurprisingly, **approximative inversion** triggers obligatory default agreement in the subject position:

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

Passivization of accumulative verbs (in their creation uses) gives rise to the default agreement pattern (with some caveats, see Matushansky and Ruys 2013):

(19) Vsego bylo nafotografirovano ?djužina/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: 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. While slightly marked with pseudo-partitives, it is perfect with numerals

Constructions with the classifier-like items *čelovek* ‘persons’, *štuk* ‘items’, *golov* ‘heads’ also require default agreement (Pereltsvaig 2006b):

(20) Desjat’ čelovek terroristov s pistoletami stoit/??stojat vo dvore.
ten persons terrorists with handguns stand-NSG/PL in yard
Ten terrorists with handguns stand in the yard.

So degrees at least form a subset of non-agreeing numeral NP subjects

4.2. The referential deficiency of non-agreeing numeral NPs

Pereltsvaig 2006b identifies a number of **properties of non-agreeing numeral NPs** that they share with direct objects of **accumulative verbs**

The assumption that both denote degrees straightforwardly explain these properties

4.2.1. Non-individuated interpretation

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

(21) Rol’ Džejmsa 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.

The default agreement is possible if those five actors performed the role of James Bond in the same movie (Pereltsvaig 2006b), yet the NP is not interpreted as a group (Pesetsky 1982:85) and collective predicates are generally infelicitous with default agreement

Likewise, verbs that select individuated objects are incompatible with the accumulative prefix *na-*:

(22) *Džejms Bond naljubil [(pjat) krasivyx ženščin]. Pereltsvaig 2006b
James Bond ACM-loved (five) beautiful women
intended: *James Bond loved many beautiful women.*

Intuition: separate individuals are not distinguished

Correlation: degrees are in fact non-individuated (see the discussion of Krifka 1990 below)

4.2.2. Lack of specific or referential interpretation

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

(23) V Mariinskom teatre tancevali/*tancevalo [opredelënnye pjat’ balerin]. Pereltsvaig 2006b
in Mariinsky theater danced-PL/*-NSG certain five ballerinas-GEN
A certain five ballerinas danced in the Mariinsky Theater.

(24) Džejms Bond nasobiral [(*opredelënnuju) oxapku cvetov]. Pereltsvaig 2006b
James Bond ACM-picked particular armful flowers-GEN
James Bond picked an armful of flowers.

Non-partitivity: (25b) cannot be taken as the continuation of (25a):

(25) a. Deti vymyli vse griby… Pereltsvaig 2006b
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.*

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

(26) V naš gorod priexali baleriny iz Peterburga. Pereltsvaig 2006b
in our town came ballerinas from Petersburg
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

Lack of non-isomorphic wide scope:

(27) 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.

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

Intuitively, low referentiality entails no specificity/D-linking and therefore the inability to outscope a higher quantifier

Degrees are expected to have low referentiality and are independently known to be unable outscope any quantifier (the Heim-Kennedy generalization, Kennedy 1999, Heim 2000)

4.2.3. Pronominalization

Pereltsvaig 2006b: non-agreeing numeral NP subjects can be pronominalized by *skol'ko* 'how much/how many' and *stol'ko* 'that much/many'; no other pronominal element is possible:

(29) 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.

Direct objects of accumulative verbs in creation uses are also incompatible with pronouns:

(30) *Džejms Bond napriglašal nas/menja.
James Bond ACM-invited us me
intended: *James Bond invited {us / me} a lot.*

Adger 1996: measure phrases (i.e., unambiguous degrees) cannot be DPs (cf. (29))

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

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

(31) [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**:

(32) [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.

Pereltsvaig 2006b also claims that non-agreeing subjects and direct objects of accumulative verbs cannot control PRO and bind reflexives and reciprocals, but the actual facts are more complicated than that (see Matushansky and Ruys 2013)

Proposal: it's because pronouns cannot denote degrees.

4.3. Working hypothesis

The default agreement on the verb is clearly associated with referential deficiency:

- unquestionable: **when the subject denotes a degree**
- potential extension: degree-denoting NPs form a special case of a broader class of referentially deficient elements (e.g., NPs or QPs (Pesetsky 1982, Franks 1994, Pereltsvaig 2006b), non-individuated entities, nonspecific indefinites...)

Against extension: no evidence for a broader class; degrees are independently motivated

5. THE 4000 SHIPS AND THE SYNTAX OF DEGREES

Krifka 1990 observes that examples like (33) are ambiguous:

(33) Four thousand ships passed through the lock last year.
a. there exist 4000 individual ships that passed through the lock — object-related
b. there were 4000 events of passing through the lock by a ship — event-related

Gupta 1980: the solution lies in different criteria of identity for different nouns:

(34) National Airlines served at least two million passengers in 1975.

Carlson 1982, Doetjes and Honcoop 1997, Barker 1999: what's being counted is stages

Krifka 1990: it is impossible to count stages and the ambiguity can be constructed for almost any noun. Event-oriented readings involve degrees

5.1. Event-oriented readings and degree contexts

Unsurprisingly, event-oriented readings of numeral NPs cannot trigger plural agreement on the verb and decline as inanimates even if containing a lexically animate noun:

(35) a. 4000 korablej prošli čerez šljuz. — plural: individual ships only
4000 ships passed-PL through lock
4000 ships passed through the lock.

b. 4000 korablej prošlo čerez šljuz. — default: no commitment
4000 ships passed-N.SG through lock
4000 ships passed through the lock.

(36) a. ?Dvadcat' dvux čelovek *pro* èvakuirovali. — animate: individual people only
twenty two-ACC=GEN person-GEN.PL evacuate-PAST-PL
Twenty-two people were evacuated.

b. Dvadcat' dva čeloveka *pro* èvakuirovali. — inanimate: no commitment
twenty two-ACC=NOM person-PAUC evacuate-PAST-PL
Twenty-two people were evacuated.

Approximative inversion is fully compatible with event-orientation:

(37) Čerez šljuz prošlo korablej četyresta.
through lock passed-N.SG ships 4000
Some 4000 ships passed through the lock.

Accumulative verbs in their creation uses necessarily give rise to distinct individuals, but if pre-existence is not excluded, event-oriented readings are perfectly fine:

(38) a. Na ètix fotkax ja nasčital tysjaču soldat.
on these photos I ACM-counted thousand-ACC soldier-PL-GEN
On these photographs I counted one thousand soldiers.

The meaning of the verb has to be compatible with an event-oriented reading, so once again a broader phenomenon can potentially be suspected

Barker 1999: the contribution of *different*:

(39) 4000 raznyx/različnyx korablej prošli/*prošlo čerez šljuz. no event-related reading
4000 different ships passed-PL/NSG through lock
4000 different ships passed through the lock.

Strikingly, *different* is incompatible with measure nouns (**different meters/kilograms*)

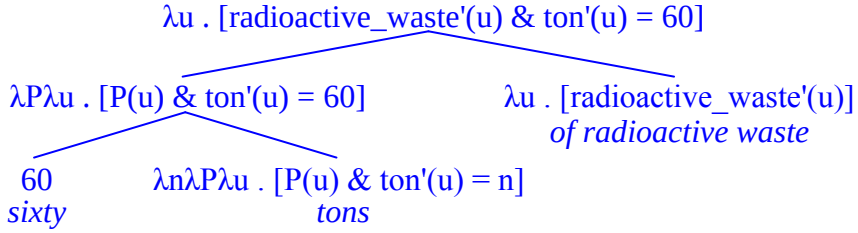
Conclusion: **degree-denoting numeral NPs allow event-related readings** (diagnosed by the possibility of the same individual participating in the event more than once)

Clear degree-denoting numeral NPs are extremely unlikely to involve stages (contra Doetjes and Honcoop 1997 and Barker 1999)

5.2. Krifka's solution

The numeral NPs in examples like (33) denote degrees, defined as **quantized predicates**:

(40)



Under this view degrees are complex objects containing by virtue of the lexical semantics of their components the **position on the scale**, (the scale incorporated into) the **unit of measure** and the **substance** measured (which can also be supplied by an additional component)

The degrees defined by Grosu and Landman 1988 are also complex objects, consisting of the measure value, the measure domain (substance) and the object measured (although the details are somewhat less worked out than in Krifka's analysis):

(41) three books → λx. BOOKS(x) & $\text{DEGREE}_{\text{BOOKS}}$(x) = **⟨3, BOOKS, x⟩**

Krifka's solution clearly extends to Russian degree-denoting NPs in argument positions

To combine a degree with a predicate Krifka defines two operators: Ø and OEMR:

The **object-related** reading of the numeral NP asserts the existence of the (plural) individual that the numeral NP measures

(42) Ø = λQλRλe∃u [R(e,u) & Q(u)] null existential quantifier

The **event-related** reading measures events in the terms of the numeral NP measure:

(43) Let Σ be a quantized predicate of the lattice sort and α an event relation then OEMR (α) is defined as the smallest relation σ between an event and a quantized predicate of the lattice sort Σ such that (for any event e and quantized predicates β, β')

(i) (Standardization)
$\neg$ ITER(e, α) $\rightarrow$ [σ (e, β) $\leftrightarrow$ $\exists$u[β(u) & α (e, u)]]

(ii) (Generalization)
$\neg$ e $\circ_{\Sigma}$ e' & σ (e, β) & σ(e', β'') $\rightarrow$ σ (e U_{Σ} e', β $+_{\Sigma}$ β')

In English and in small print:

- if the event is not iterative (i.e., e.g., no ship passes the lock more than once), then OEMR yields true of an event and a measure if there exists an entity corresponding to the measure (i.e., the plural individual consisting of 4000 ships) that participated in the event
- otherwise the event is separated into a number of non-iterative non-overlapping pass-through-the-lock sub-events and the measure into the corresponding number of sub-measures that together add up to the main event and 4000 ships, respectively, and of which OEMR holds (pairwise)

Minor problems with this solution:
- the need for real numbers as a semantic type
- the need to regard count nouns as measure functions (but see Krifka 1989)
- the syntax (shared by Landman 2004, Rothstein 2009, Partee and Borschev 2012)

None of these assumptions are really necessary (Ruys 2014) -- what matters is that **numeral NPs can denote degrees**

6. THE SYNTAX OF AGREEMENT FAILURE

Agreement failure is sensitive to both the syntax and the semantics of numeral NPs subjects

The lack of an overt determiner does not lead to agreement failure:

(44) a. Dinozavry žili/*žilo v tretičnom periode. bare plurals
dinosaurs lived-PL/NSG in Triassic period
Dinosaurs lived in the Triassic period.

b. Za reformy golosoval/*golosovalo odin procent. the cardinal *one*
for reforms voted-MSG/NSG one-MSG percent.M
One percent voted for the reforms.

Degree denotation does not lead to agreement failure if the degree itself is definite/specific:

(45) Last night I drink five liters of beer and...

sejčas èti pjat' litrov/*èti litry dajut/*daët o sebe znat'.
now these five liters these liters give-3PL/3SG about self know
now these five liters are making themselves felt.

Approximative NPs require plural agreement if presupposed to exist (see Mel'čuk 1985:373-374):

(46) Okolo trëxsot takix ženščin brosilis' k nemu so vsex storon.
around three.hundred such women rushed towards him from all sides
Around 300 such women rushed towards him from every side.

Pereltsvaig 2006b: non-agreeing subjects lack the DP layer
Problem: what about the cardinal *one*? and what about **wh-indefinites**:

(47) a. Kakie zveri zdes' živut/*živët?
what animals here live-PL/SG
What/which animals live here?

b. Skol'ko zverej zdes' živët/*živut?
how many animals here live-SG/PL
How many animals live here?

Proposal:

- syntactic agreement tracks formal (syntactically active) ϕ-features: the adjectival *one* and wh-indefinites inherit the phi-features of the noun
- cardinals higher than *one* do not have formal phi-features (cf. Klockmann 2013)
- if numeral NPs are referential, their phi-features can be retrieved semantically (cf. Dowty and Jacobson 1988, Corbett 2006)
- otherwise default agreement ensues (see Preminger 2011)

The mechanism of semantically-based agreement is still unclear

7. CONCLUSION AND FURTHER QUESTIONS

We have argued that non-agreeing numeral NPs subjects in Russian denote degrees

Evidence:

- numeral NPs headed by non-measure nouns can denote degrees
- all cases where degree denotation can be independently established trigger default agreement (unless existence is presupposed)
- there is no independent evidence for a broader semantic or syntactic category for non-agreeing numeral NPs than non-referential degrees

The compositional semantics of degree-denoting numeral NPs in argument positions, for the lack of a better hypothesis, is supplied by Krifka 1990

7.1. Future research

Why do we have doubts about Krifka's account?

Issue 1: **simplified nominal semantics**: all NPs denote extensive measure functions; there is no difference between lexical measure nouns (*liter*, *kilogram*...) and derived measures, while it seems likely that with lexical measure nouns the event-oriented reading is the default:

(48) This reactor requires 3000 liters of water for cooling per month. recycling allowed

The intuition that event-oriented readings involve measures is not expressed: object-oriented readings are constructed on the basis on exactly the same NPs

Issue 2: **status of OEMR**: since it can be necessary in any argument position, OEMR would seem to be a determiner. However, degree-denoting NPs can also combine with determiners:

(49) The 4000 ships that passed through the lock last year brought us hardly any revenue.

Krifka provides accounts for *many*, *most*, *every* and *no*, but they do not have the same status: the apparent event-oriented readings with *every* and *no* are actually associated with focus:

(50) a. Which lock did every ship pass through AT NIGHT? multiple passings impossible
b. Which lock did 4000 ships pass through AT NIGHT? multiple passings allowed

Furthermore, true quantifiers do not combine with measure nouns (**every meter longer*)

The vague numerals *many*, *most*, etc., pattern with cardinals. Krifka's NP-internal syntax and compositional semantics cannot handle vague numerals, but with certain modifications (Ruys 2014) the OEMR will work

Issue 3: the issue of **non-individuation is not addressed**; however, agreement failure with non-individuated numeral NPs in Russian actually forms part of a broader cross-linguistic phenomenon of individuation hierarchies in syntax

7.2. Non-individuation and numeral stranding

Pesetsky 1982: a left-edge topic with a correlate in a bare numeral NP subject is incompatible with the plural agreement on the verb:

(51) Planov stroitel'stva bylo/*byli dva. Grashchenkov 2009
plan-GEN-PL construction-GEN was-N.SG/PL two-NOM
There were two construction plans.

Semantically, such examples are felt to be about amounts, so stranded numerals can be used to determine whether a numeral NP denotes a degree in an environment where the agreement diagnostic cannot be applied.

However, the fronted NP in numeral stranding is not itself an argument of the cardinal (since a paucal cardinal would have assigned paucal rather than genitive plural):

(52) Ja vižu dva minusa/*minusov. Grashchenkov 2009
I see two minus-PAUC/minus-PL-GEN
I see two drawbacks.

On the assumption that numeral stranding involves a null classifier (licensed somehow by the hanging topic itself) it is unsurprising that true measure nouns cannot be left-edge topics:

(53) a. My kupili pjat' kilogrammov jablok.
we bought five kilogram-GEN.PL apple-GEN.PL
We bought five kilograms of apples.

b. *Kilogrammov my kupili pjat' jablok.
kilogram-GEN.PL we bought five apple-GEN.PL

c. *Kilogrammov jablok my kupili pjat'.
kilogram-GEN.PL apple-GEN.PL we bought five

(54) a. My ždali pjat' časov.
we waited five hour-GEN.PL
We waited for five hours.

b. ČASOV/*časov my ždali pjat'.
hour-GEN.PL we waited five
If you count in hours, then we waited for five hours.

So numeral stranding cannot be cross-checked against other degree contexts (approximative inversion, differentials, accumulative verbs): while possible, it doesn't front the measure noun

8. BIBLIOGRAPHY

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