

GENDER MISMATCH VARIATION IN RUSSIAN: EVIDENCE FROM PRODUCTION AND JUDGEMENT DATA*

1. Gender Agreement Patterns in Russian

The standard agreement pattern implies the same gender values for adnominals and verbs inflected for past tense choosing between masculine, feminine and neuter agreement.

	DP			Verb	DO
	Determiner	Attributive	Noun		
Masculine	<i>Moj</i>	<i>dorogoj</i>	<i>brat</i>	<i>kupil</i>	<i>kartinu</i>
	My-M	dear-M	brother.M	bought-M	picture
Feminine	<i>Moja</i>	<i>dorogaja</i>	<i>mama</i>	<i>kupila</i>	<i>kartinu</i>
	My-F	dear-F	mother.F	bought-F	picture
Neuter	<i>Mojo</i>	<i>dorogoje</i>	<i>objedinenie</i>	<i>kupilo</i>	<i>kartinu</i>
	My-N	dear-N	association.N	bought-N	picture

However, there is a set of nouns that denote professional status of humans and by default trigger masculine grammatical agreement, but that are also used for denoting female humans as far as they do not have a feminine parallel: *vrač* ‘doctor’, *direktor* ‘director/principal’, *sekretar'* ‘secretary’, *agent* ‘agent’, *redaktor* ‘editor’. When referring to women in nominative case they may trigger both masculine or feminine agreement and gender mismatch may occur: constituents may demonstrate different values of the same feature.

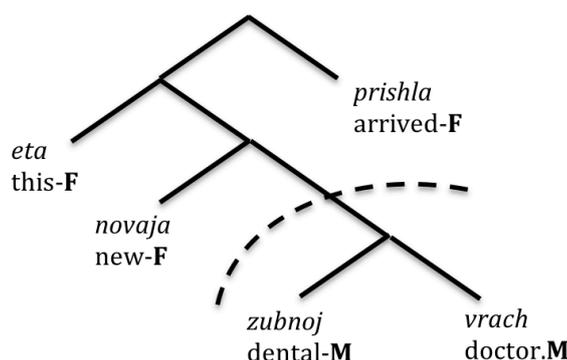
Table 1. *The paradigm adopted from (Lyutikova 2015) with added demonstratives*

	Demonstrative	High adjective	Low adjective	Noun	Verb (Past)	Agreement pattern
a.	<i>etot</i> this-M	<i>novyj</i> new-M	<i>zubnoj</i> dental-M	<i>vrač</i> doctor.M	<i>prishel</i> arrived-M	masculine grammatical agreement
b.	<i>etot</i> this-M	<i>novyj</i> new-M	<i>zubnoj</i> dental-M	<i>vrač</i> doctor.M	<i>prishla</i> arrived-F	feminine predicate agreement = <i>referential</i>
c.	<i>eta</i> this-F	<i>novaja</i> new-F	<i>zubnoj</i> dental-M	<i>vrač</i> doctor.M	<i>prishla</i> arrived-F	feminine attributive and predicate agreement
d.	<i>***eta</i> this-F	<i>novaja</i> new-F	<i>zubnaja</i> dental-F	<i>vrač</i> doctor.M	<i>prishla</i> arrived-F	
e.	<i>*eta</i> this-F	<i>novaja</i> new-F		<i>vrač</i> doctor.M	<i>prishel</i> arrived-M	ill-formed
f.	<i>*etot</i> this-M	<i>novyj</i> new-M	<i>zubnaja</i> dental-F	<i>vrač</i> doctor.M		

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- Low adjectives cannot demonstrate feminine agreement.
Low adjectives ~ classifying adjectives (Rothstein 1980); adjectives with nonintersective, idiomatic or argumental interpretation (Svenonius 2008, Pesetsky 2013, Lyutikova 2015): *publishing editor, first lieutenant, academic secretary, French toast, wild rice*.
- According to grammars:
(Table 1: b) is the preferred agreement pattern: attributives agree with the formal features of the noun and predicate shows feminine agreement.
(Table 1: d) is not acceptable: all attributives show feminine agreement
- The general restriction:
An attributive bears feminine agreement only when *higher* attributive (left attributive) and a verb are feminine.

Fig. 1



2. Gender Mismatch Analysis

The main idea: The observed variance results from “feminization” at some stage of derivation, that henceforth determines agreement pattern of the nominal.

The examples:

- | | | | | |
|--------|--------------------------------|----------------------------------|----------------------------------|--|
| (1) a. | <i>nov-yj</i>
new-M.NOM.SG | <i>redactor</i>
editor.NOM.SG | <i>rabotala</i>
was working-F | <i>s uvlecheniem</i>
enthusiastically |
| b. | <i>nov-aja</i>
new-F.NOM.SG | <i>redactor</i>
editor.NOM.SG | <i>rabotala</i>
was working-F | <i>s uvlecheniem</i>
enthusiastically |

2.1 Inherent Semantic Feature [FEMALE]

(Matushansky 2013):

- Gender switch occurs when a gender semantic feature [FEMALE] is introduced into syntactic structure with a node.
- For (1a) [FEMALE] is introduced within the VP, for (1b) [FEMALE] is introduced by AP *novaya*.

Fig. 2

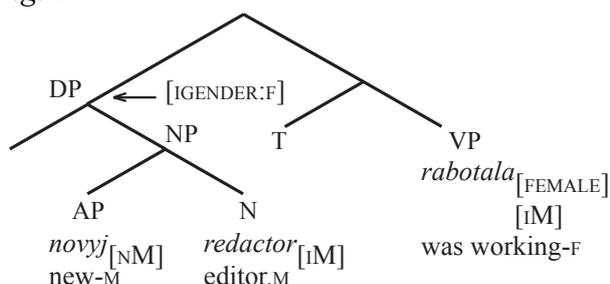
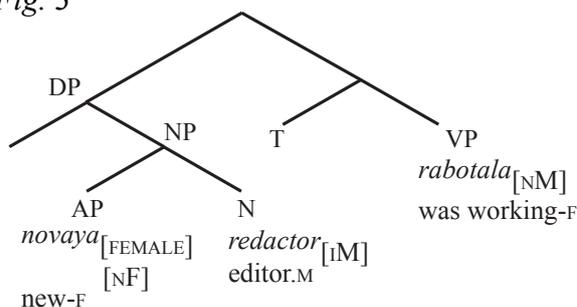


Fig. 3



2.2 The Feminizing Head Ж

(Pesetsky 2013):

- Gender switch occurs when a phonologically null morpheme Ж ([že]) is introduced.
- The feminizing head cannot be merged below a certain structural threshold that is above the lowest level of the nominal phrase at which adjectives with nonintersective, idiomatic or argumental interpretation are introduced.

Fig. 4

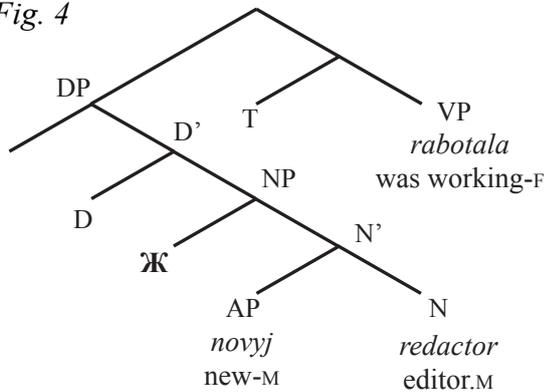
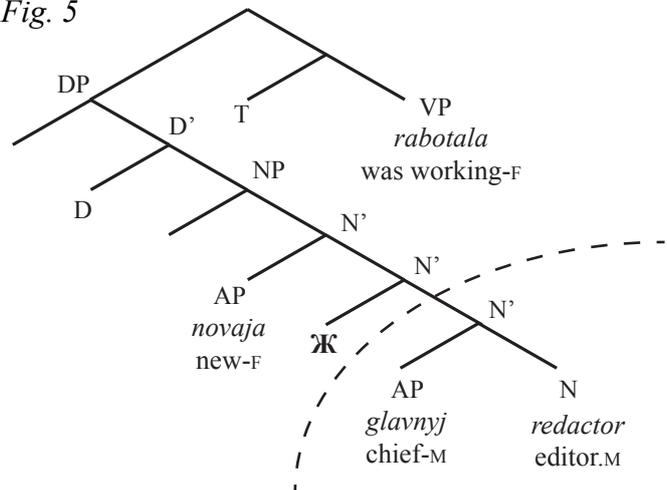


Fig. 5



(Lyutikova 2015):

- More precisely describes possible positions of the feminizing head inside the syntactic structure of Russian DP. Ж should be introduced: above the level of lexical noun; above cardinal and collective numerals.
- Referential agreement correlates with the DP projection.
- Adjectives, demonstrative and possessive pronouns can occupy different positions in the syntactic structure: appear higher or lower Ж.

Fig. 6

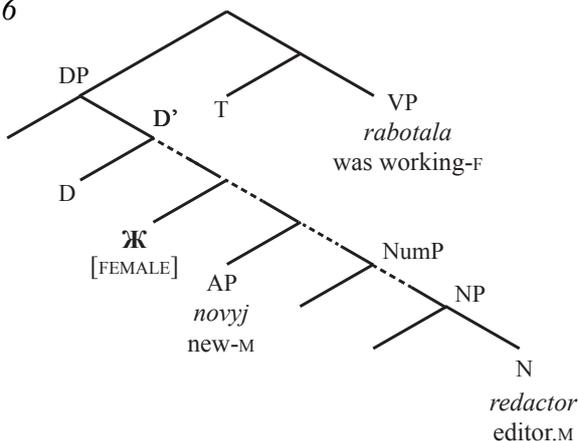
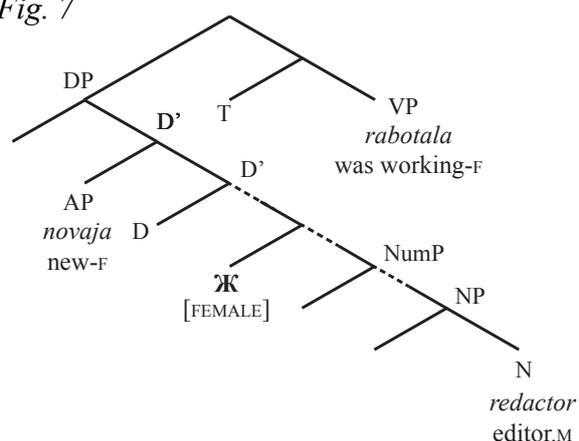


Fig. 7



2.3. The multilayered DP-hypothesis

(Steriopolo 2018):

- Following (Zamparelli 1995, Cheng, Heycock, and Zamparelli 2017) assumes the multilayered DP-hypothesis, according to which the three topmost layers of DP correspond to referential (Strong DP), predicative (Predicative DP), and kind interpretation (Kind DP).
- The semantic gender feature [FEMALE] can be inserted in the head of SD, which receive a referential interpretation.

➤ Adjectives modify different layers of DP.

Fig. 8

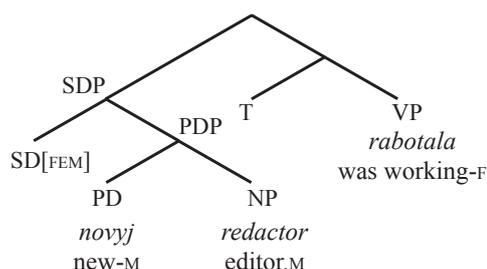
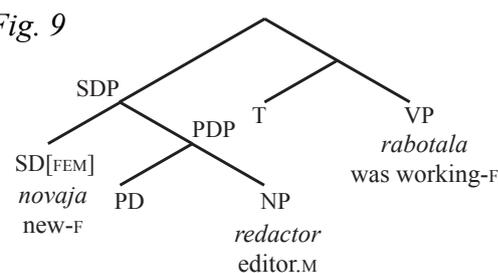


Fig. 9



2.4. DP as Referential Semantics Domain

- (2) a. ? *ochen'* *interesn-aja* *nov-yj* *vrach* (Pesetsky 2013: (38))
 very interesting-F new-M doctor
- b. **ochen'* *interesn-yj* *nov-aja* *vrach*
 very interesting-M new-F doctor

(Pesetsky 2013): (2a) is marginally possible. Ill-formedness of (2b) is explained by the fact that the lower constituent already demonstrates female agreement, which means that the feminizing head has already merged (3b).

- (3) a. [_(F) very interesting-F.NOM.SG [_(F) new-F.NOM.SG [_(F) Ж [_(M) doctor.NOM.SG]]]
 b. *_(M) very interesting-M.NOM.SG [_(F) new-F.NOM.SG [_(F) Ж [_(M) doctor.NOM.SG]]]

All the analyses discussed above allow (2a) because neither of them poses restriction on where several adjectives and demonstratives can be located in the syntactic tree with respect to the feminine semantic feature.

⇒ The analyses do not account for the fact that constituents of the same nature cannot have different gender value.

(Pereltsvaig 2015): (2a) is considered to be ill-formed.

Relying on Lyutikova's (2015) hypothesis that referential agreement correlates with the DP projection, Pereltsvaig proposes the syntactic structure consisting of *nP* and DP layers. Both *nP* and DP may introduce the referential argument (Pereltsvaig 2001), which may bear the gender semantic feature [FEMALE].

Fig. 10

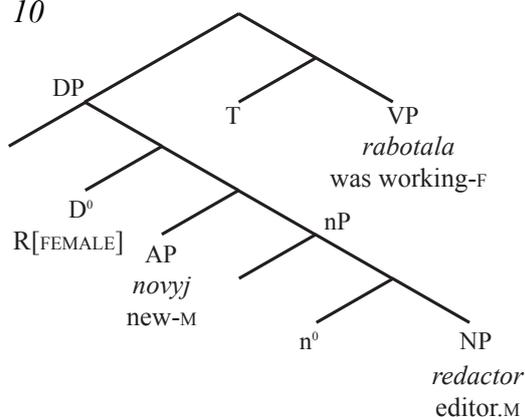
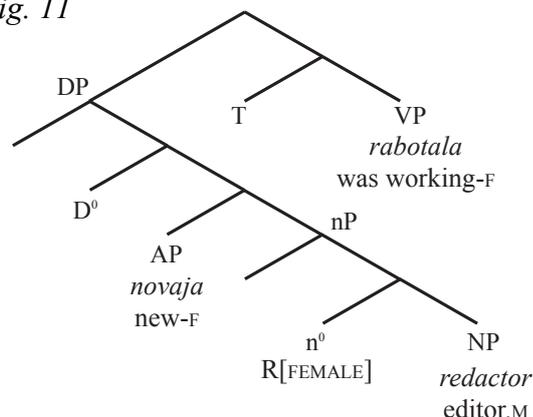


Fig. 11



Ill-formedness of (2a) can be explained by the fact that APs cannot be separated by the referential argument. An interesting question is what happens when the demonstrative/possessive pronoun is feminine and high adjective is masculine. Is this pattern possible or it is as unacceptable as (2a)?

- (4) *nash-a trudoljubiv-yj menedzher organizoval-a konferenciju*
 our-F hard-working-M manager.M organized-F conference

(Lyutikova 2018): possessive and demonstrative pronouns do not obligatory correspond the D head: they do not receive GEN from the D head, they do not act as arguments of the noun. Their distribution is similar to the one of adjective modifiers.

Therefore, we may expect that the pattern in (4) would be as unacceptable as the pattern in (2a)

The key question to decide which analysis is more appropriate:

To which extent semantic factors influence the choice of gender agreement pattern?

3.1. Experiment 1

Aim: Find out the range and frequency of mixed agreement patterns. **Participants:** 106 speakers.

Materials: In this experiment I wanted to estimate how speakers would inflect various combinations of attributives and past tense verb knowing that the noun was referring to female human.

Gender agreement was examined for various combinations of determiners (possessive, demonstrative pronouns), high adjectives, low adjectives and verb inflected for past tense. All combinations used are listed in (5).

(5)	1. <i>det</i> <i>high adj.</i> <i>low adj.</i>	our hard-working executive supervisor organized
	2. <i>det</i> <i>high adj.</i>	our hard-working supervisor organized
	3. <i>det</i> <i>low adj.</i>	our executive supervisor organized
	4. <i>det</i>	our supervisor organized
	5. <i>high adj.</i> <i>low adj.</i>	hard-working executive supervisor organized
	6. <i>high adj.</i>	hard-working supervisor organized
	7. <i>low adj.</i>	executive supervisor organized
	8. (no attributives)	supervisor organized

det = determiner (possessive/demonstrative pronoun)

Respondents were asked to read a compound sentence:

The first clause provided context that explicitly indicated the gender of the human denoted by the subject in the second coordinate clause. This was done by using traditionally female name. In this part of the sentence there was no agreement morphology involved. The second clause contained the noun phrase and the verb in past tense with gaps instead of endings. Native speakers were asked to write the attributive and the verb with the endings in the textbox so that the sentence was complete.

- (6) Vsju noch' Tane ne udalos' somknut' glaz: **nash_ otvetstvenn_ proektn_ menedzher gotovil_ prezentaciju reklamnoj kompanii dlja radioholdinga.**
*All night long Tanya (female name) didn't have a chance to get a wink of sleep: **our responsible project manager was preparing** a presentation of promotional campaign for the radio corporation.*
- (7) a. nash otvetstvennyj proektnyj gotovil
 our-**M** responsible-**M** project-**M** was preparing-**M**
- b. nash otvetstvennyj proektnyj gotovila
 our-**M** responsible-**M** project-**M** was preparing-**F**

3.2. The Results:

Exp. 1 shows that the distribution of patterns for combinations of attributives does not differ significantly. In **68%** of answers speakers used attributives in masculine while verb was feminized.

(8) *nash otvetstvenn-yj proektn-yj menedzher gotovil-a prezentaciju*
our-M responsible-M project-M manager.M was preparing-F presentation

Agreement with the formal features of noun was in **25%** of answers.

(9) *nash finansov-yj analitik predstavil prognoz cen na neft'*
our-M financial-M analyst.M presented-M forecast for oil prices

Purely feminine agreement is possible only for types 1, 2, 3 and 5 of combinations (1).

At least one modifier was feminine in 5% of answers.

(10) *vash-a uchen-yj sekretar' organizoval-a konferenciju*
your-F academic-M secretary.M organized-F conference

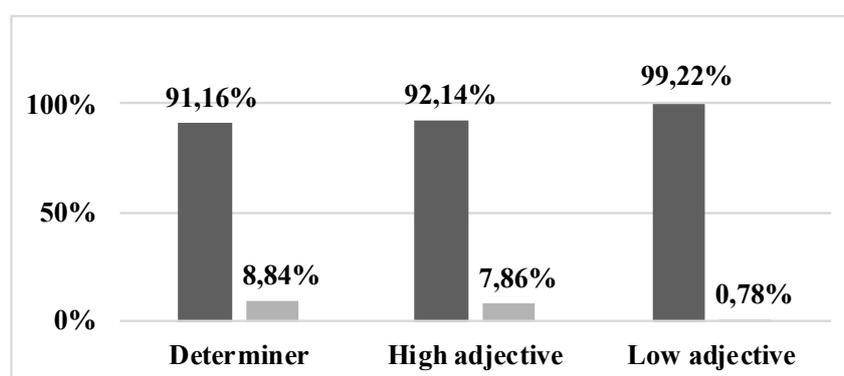


Fig. 12. Masculine vs. feminine attributive agreement

Determiners were demonstrating feminine agreement more often when high adjective was also feminine.

(11) a. feminine determiner + masculine high adj. (2,19%)

nash-a talantliv-yj povar
our-F talented-M cook.M

b. feminine determiner + feminine high adj. (4,4%)

nash-a talantliv-aja povar
our-F talented-F cook.M

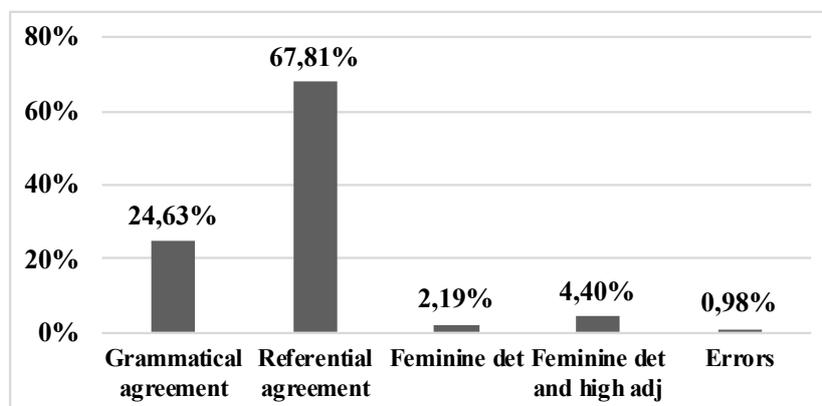


Fig. 13. Distribution of agreement patterns for combinations 1 and 2

⇒ Speakers preferred to use the pattern with no gender mismatch between determiner and high adjective. However, frequency of feminine attributive agreement is significantly low.

3.3. Experiment 2

Aim: Gather acceptability judgements of different gender agreement patterns.

Participants: 57 respondents from Exp.1.

Materials: The task involved evaluating the acceptability of sentences constructed by the same model that was applied in the first experiment using a five-point Likert scale.

In this experiment I used the 8 combinations from (5). For each combination the examined patterns were:

- grammatical agreement (A)
- attributive feminine agreement (B)
 - including feminized low adjectives (B') (for combinations 1, 3, 5, 7)
- referential agreement (C)
- ill-formed agreement patterns (D)

This makes in total 32 conditions. For each condition there were 2 sentences, which makes in total 60 sentences (type 8 can only show patterns A and C).

3.4. The Results

Exp. 2 shows that the judgement of patterns for different combinations of attributives does not differ significantly. Referential agreement is the most acceptable agreement pattern.

- (12) *nash otvetstvenn-yj proektn-yj menedzher gotovil-a prezentaciju*
 our-M responsible-M project-M manager.M was preparing-F presentation

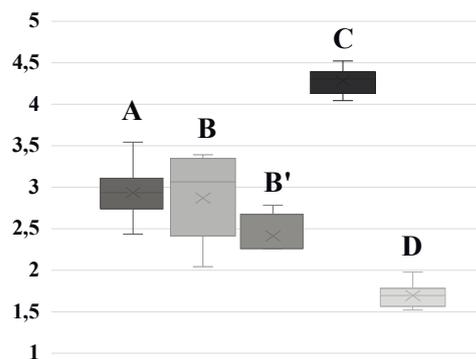


Fig. 14. Boxplot for different patterns

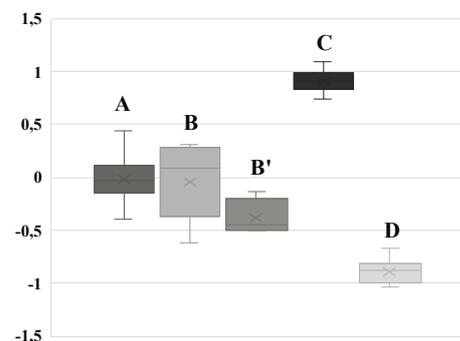


Fig. 15. Boxplot for different patterns (z-score)

Grammatical agreement and feminine agreement within determiners and high adjectives are both less acceptable. The difference between the scores of these two patterns appeared to be non-significant.

- (13) *nash finansov-yj analitik predstavil prognoz cen na neft'*
 our-M financial-M analyst.M presented-M forecast for oil prices

- (14) a. *vash-a uchen-yj sekretar' organizoval-a konferenciju*
 your-F academic-M secretary-M organized-F conference

- b. *trudoljubiv-aja sekretar' organizoval-a konferenciju*
 hard-working-F secretary-M organized-F conference

- c. *vash-a trudoljubiv-aja sekretar' organizoval-a konferenciju*
 your-F hard-working-F secretary.M organized-F conference

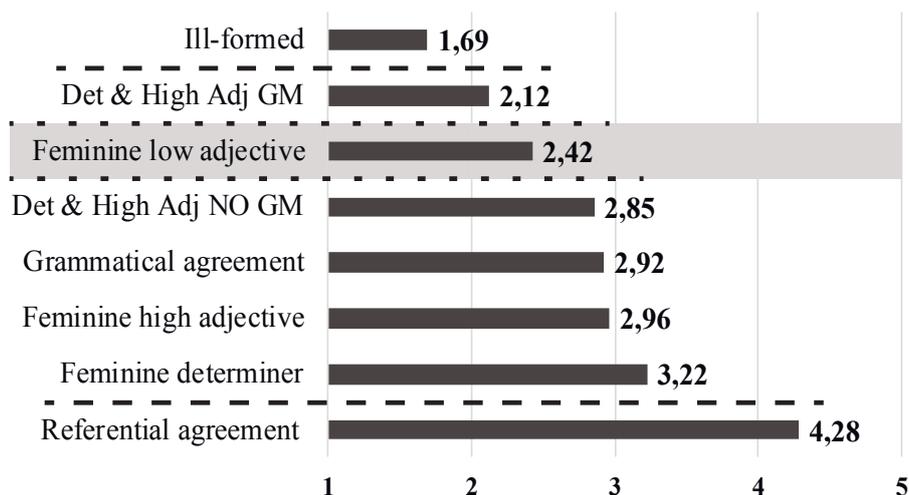


Fig. 16. The mean scores for different patterns¹

Gender mismatch for determiner and high adjective is significantly less acceptable than the pattern when both determiner and high adjective are feminine.

- (15) a. *nash-a talantliv-yj povar* *less acceptable*
 our-F talented-M cook.M
- b. *nash-a talantliv-aja povar* *more acceptable*
 our-F talented-F cook.M

The acceptability score of feminine low adjective is significantly higher than the lowest possible score. It is:

- significantly more acceptable than ill-formed;
- significantly less acceptable than referential agreement for the determiner.

⇒ **The pattern with no gender mismatch between determiner and high adjective was more acceptable than the pattern with gender mismatch. However, in general both feminine attributive agreement and grammatical agreement patterns are not considered acceptable.**

4. The Comparison

(Muchnik 1971) – questionnaire-based research. The questionnaire distributed in 1963. 3780 participants. Several lexical variants of “high adjective + noun” and “noun + verb” combinations.

How would you say referring to woman: “nice-M doctor” or “nice-F doctor”?

(Graudina et al. 1976) – frequency-based stylistic dictionary of variants.

Statistical research; data from newspaper corpus from 60s-70s. The frequency distribution of agreement patterns provided separately for attributive agreement with high adjectives and for predicate agreement.

¹ As the result of the experiment we analyzed the acceptability judgements of the stimuli and calculated the average acceptability scores. To eliminate some of the potential scale bias *z-score transformation* was applied to each participant’s response. However, results of the statistical tests were same for bare data and for z-score transformed data.

To group the patterns *Student’s t-test* was applied to the sets of acceptability scores for different agreement patterns. T-test shows whether the mean differences between the sets are significant.

(16)			(Muchnik 1971) 60s	(Graudina et al. 1976) 60s-70s	<i>Current survey</i>
a.	novyj new-M	vrach doctor.M	69.9%	69.05%	92.14%
b.	novaja new-F	vrach doctor.M	25%	30.96%	7.86%
c.	vrach doctor.M	prishel arrived-M	38.6%	4.57%	25.21%
d.	vrach doctor.M	prishla arrived-F	51.7%	95.43%	74.79%
e.	moj my-M.	vrach doctor	-	-	91.16%
f.	moja my-F	vrach doctor	-	-	8.84%

⇒ In 50 years the distribution of masculine and feminine agreement within verbs and high adjectives has significantly changed. The percent of agreement with formal features of the noun has increased.

5. Discussion

5.1. Modelling the gender mismatch

- The comparison with data from (Graudina et al. 1976) concerning predicate agreement shows that the frequency of feminization is declining.

Has grammatical agreement indeed become more frequent or such difference is the result of the change in methods (controlled experiment vs. questionnaire and corpus)?

- Determiners and high adjectives demonstrate feminine agreement to the same extent.

Demonstrative and possessive pronouns and high adjectives have the same effect as two high adjectives regarding referential agreement.

- (21) a. *interesnyj* *novyj* *vrach*
interesting-M.NOM.SG new-M.NOM.SG doctor.M.NOM.SG
- b. *moja* *zamechatel'naja* *redaktor*
my-F.NOM.SG wonderful-F.NOM.SG editor.M.NOM.SG
- c. *?interesnaja* *novyj* *vrach*
interesting-F.NOM.SG new-M.NOM.SG doctor.M.NOM.SG
- d. *?moja* *zamechatel'nyj* *redaktor*
my-F.NOM.SG wonderful -M.NOM.SG editor.M.NOM.SG

Contra to the analyses by Matushansky (2013), Pesetsky (2013), Lyutikova (2015) and Steriopolo (2018):

The merge of gender semantic feature [FEMALE] between two adnominal constituents (excluding low adjectives) is troublesome. The number of possible positions for the feminizing head / [FEMALE] feature is decreasing till two: right above low adjectives and above attributives.

The analysis by Pereltsvaig (2015) seems to be the most appropriate with respect to the data because it describes the correct restriction on gender mismatch for attributives.

Fig. 17

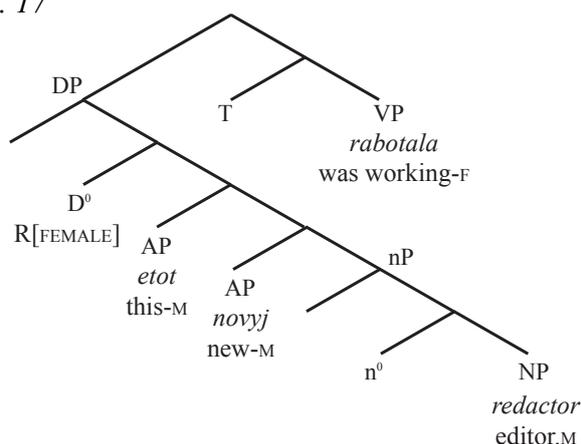
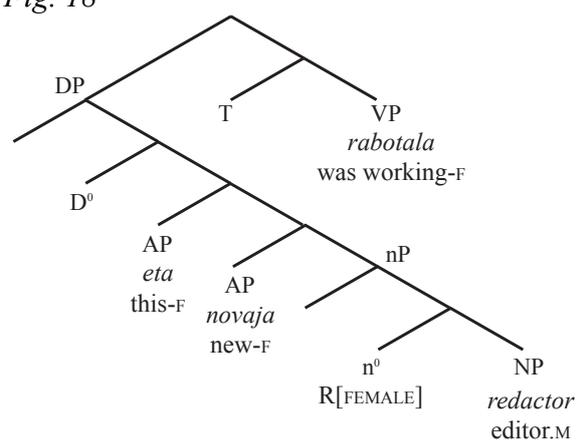


Fig. 18



However, the analysis by Pereltsvaig (2015) is inconsistent with Russian data. According to Lyutikova (2018), the position of the attributives in the syntactic structure of Russian DP is not fixed. The disadvantage of the analysis by Lyutikova (2015) is in that nothing prohibits the two APs from occupying positions below and above Ж at the same time.

Fig. 19

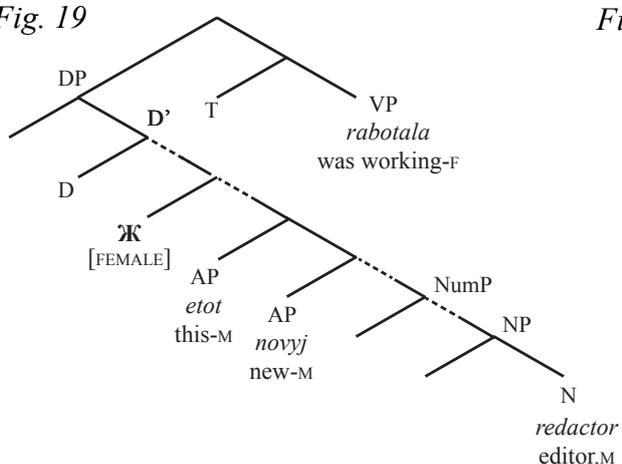
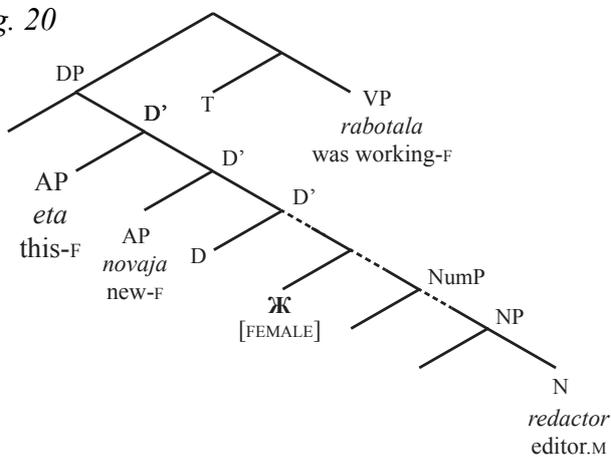


Fig. 20



The temporary solution could be to postulate this restriction additionally. For example, we could posit that the semantic feature [FEMALE] can appear on D and the modifiers cannot be separated by the D head: they all appear either below or above this head. Therefore, referential agreement would correspond DP projection, which functions as referential semantics domain (in spirit of (Lyutikova 2015) and (Pereltsvaig 2015)).

5.2. Is feminine attributive agreement indeed a thing?

The two experiments have shown that the patterns within which attributives show feminine agreement are mostly restricted. Although researchers were focusing primarily on them when modelling mixed agreement, these patterns demonstrated low frequency in production experiment (5%) and low acceptability score (2,75).

Feminized **low adjective** is more acceptable than the violation of constraint “*adnominal cannot trigger referential gender if higher adnominals or predicate are masculine*”.

Grammatical or processing effect may lower the acceptability, but it does not make the sentence fully unacceptable as in the case of ill-formed clauses.

Is feminine attributive agreement indeed available for the speaker as a grammatical choice?

The obtained empirical evidence leads to the hypothesis that feminine attributive agreement arises as the effect of formal and semantic feature competition during the process of speech production. The new question: To which extent semantic factors influence gender agreement processing?

Suggestion:

- Investigate reaction times in production and perception: Conflicting semantic information should increase processing time.

5.3. Production vs. judgement

The data from the production experiment shows more variation than the data from the acceptability judgements experiment. Although grammatical agreement and feminine attributive agreement had significantly different frequencies in the production experiment, they had statistically equal acceptability scores.

Such difference raises methodological issues concerning

- (i) the efficiency of using solely production or judgment experiments when investigating variance.
- (ii) the possibility of making adequate predictions of acceptability judgements from frequencies of occurrence. Bermel et al. (2017), Verhoeven, Temme (2017) and Klavan, Veisman (2017) claim that in case of language variation judgemental data correlates with frequency in production. Our data is not in concordance with this claim.

The combination of production studies with comprehension/acceptability judgements studies provides the fuller description for cases of intralingual variation than a single method.

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