Semantic agreement in Russian:
Gender, declension, and morphological ineffability

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Abstract

In this paper, I argue that declension classes are not primitives (see Aronoff 1994, Alexiadou 2004, Kramer 2015, i.a.), but are decomposed into simpler features, one of which is gender (Harris 1991, Wiese 2004, Caha 2019). The argument is based on semantic gender agreement in Russian, where a grammatically masculine noun can trigger feminine agreement if its referent is female (Mučnik 1971, Pesetsky 2013). Semantic agreement is grammatical only in those forms where a regular nominal exponent is syncretic with an exponent of a declension class that includes feminine nouns. In other forms, conflicting masculine and feminine gender features lead to ineffability in morphology (cf. Schütze 2003, Asarina 2011, Coon & Keine 2020). Ineffability arises because the Subset Principle (Halle 1997) that holds between features of a vocabulary item and a terminal at the point of Vocabulary Insertion is violated later in the derivation. This is in turn possible if Vocabulary Insertion applying cyclically bottom-up (Bobaljik 2000) is interleaved with Lowering that alters structure below a triggering node (Embick & Noyer 2001). Finally, I show that Russian also has a number of cases where conflicting gender features in a noun phrase do not result in a realization failure (Iomdin 1980). The difference between these patterns is derived in a principled way and follows from the positions where conflicting features are introduced.

Keywords: declension class, gender, semantic agreement, morphological ineffability, feature conflicts, Russian

1 Introduction

In some languages the shape of nominal inflection is determined not only by features like number and case, but also by the declension class of a noun. A declension class can be defined as a group of nouns taking the same set of inflectional exponents (see Aronoff 1994). Class membership often correlates with gender, but there is no one-to-one correspondence between them. For instance, Russian has 3 genders and 4 declension classes (see Karcevskij 1932, Corbett 1982, and Timberlake 2004). Gender specifications cannot be fully deduced from declension class membership. All class III nouns are feminine, but class II includes both feminine and masculine nouns. Similarly, gender is insufficient to predict class. While all neuter nouns belong to class IV, feminine nouns are distributed over classes II and IV. Apart from that, class membership and gender are relevant for different processes in a language: Class determines nominal inflection, while agreement targets gender.

In this paper, I address the connection between declension class and gender: What derives correlation, but not one-to-one correspondence between them? The existing literature provides several possible answers. According to the first, declension classes are formed from bundles of features,

one of which is gender (see Roca 1989, Harris 1991, Wiese 2004, Wunderlich 2004, Caha 2019; 2021). Gender can be accompanied by phonological or formal features of a lexeme. Inflectional exponents traditionally viewed as expressing declension class then in fact realize gender combined with other features of nominal stems. According to the second answer, class exponents do not bear gender features and the relation between declension and gender is captured only indirectly, for instance by implicational redundancy rules. Under this view, there are either separate features corresponding to declension classes (as in Corbett 1982; 1991, Ralli 2000, Alexiadou 2004, Kramer 2015, Arsenijević 2021, Gouskova & Bobaljik 2022) or class is decomposed into features not related to gender (see Müller 2004, Alexiadou & Müller 2008). Finally, some approaches give the major role in forming declensions to separate class features but allow individual exponents to refer to gender in a very limited number of cases (see Halle 1992; 1994, Aronoff 1994, Halle & Vaux 1998, Calabrese 2008, and Kučerová 2018).

So far, the choice between these models has been made on the basis of such conceptual merits as elegance of a resulting model. In this paper, I present an empirical argument for the first position, using novel data on semantic gender agreement in Russian.[1] I will show that semantic agreement is subject to case number restrictions: It is grammatical only in some cells of the paradigm. The restriction is due to the inability to insert nominal exponents in the presence of an additional [+fem] feature. It indicates that insertion of nominal inflection targets gender features. Since gender alone is insufficient to determine declension classes, I suggest that declensions arise from the combination of gender ([±fem]) and an idiosyncratic feature of a nominal stem ([±α]).

I will argue that the inability to insert a nominal exponent in some forms is a case of morphological ineffability: The morphological component fails to realize a structure supplied from the syntax. Under semantic gender agreement, a problem for realization arises from the conflict between grammatical and semantic gender, which that can be resolved only if a form is syncretic and underspecified for gender. This phenomenon thus contributes to an already substantial body of evidence showing that features with conflicting values can result in a realization failure (see Groos & van Riemsdijk 1981, Zaenen & Karttunen 1984, Schütze 2003, Citko 2005, Dalrymple et al. 2009, Asarina 2011, Bhatt & Walkow 2013, Bjorkman 2016, Hein & Murphy 2019, Coon & Keine 2020 among others).

At the same time, Vocabulary Insertion governed by the Subset Principle (Halle 1997), as is widely assumed in Distributed Morphology (see Halle & Marantz 1993; 1994, Harley & Noyer 1999, Siddiqi 2010), cannot fail due the presence of an additional feature independently of whether this new feature contradicts other features in the node. In case no vocabulary item matches all features in the node, insertion resorts to an exponent that matches a subset of the features. I propose that ineffability is derived as follows. First, Vocabulary Insertion applies to *n*, where case, number, grammatical gender, and [±α] are gathered, and inserts a nominal inflectional exponent. Second, semantic gender that is introduced higher in the nominal structure, but by virtue of belonging to the noun must be also incorporated in its feature structure, lowers into *n*. If the lowered feature is more marked, it overwrites existing features, e.g., [+fem] replaces [−fem]. If the inserted vocabulary item is specified for such features, the subset relation between its features and features of the node into which it was inserted does not hold anymore. This leads to a crash.

Thus, ineffability is due to the violation of the Subset Principle, which not only underlie Vo-

cabulary Insertion, but is essentially a well-formedness constraint that must hold throughout the derivation; see, e.g., Arregi & Nevins (2012) on inviolable constraints in Distributed Morphology. The Subset Principle can be violated if features of a node are changed after Vocabulary Insertion has applied. This turns out to be possible in a model where Vocabulary Insertion that applies cyclically bottom-up coexists with the Lowering operation that alters features on the node below the trigger node. In contrast to the standard model where all morphological structure rules precede Vocabulary Insertion (Halle & Marantz 1993), I suggest that Vocabulary Insertion can be interleaved with Lowering; for other instances of interleaving Vocabulary Insertion with morphological operations see Noyer (1992), Halle (1997), and González-Poot & McGinnis (2006) on Fission, Chung (2009) on Fusion; see also Dobler et al. (2011), Piggott & Travis (2017) on interleaving Vocabulary Insertion and head movement.

According to this analysis, a contradictory feature will not lead to a realization failure if it is introduced lower in the structure and is incorporated into a node before Vocabulary Insertion. I will show that such derivations are attested in Russian with class II animate masculine nouns that have a conflict between masculine features triggering agreement in syntax and feminine gender realized by morphology, as well as with so-called common gender nouns.

I will start by introducing semantic gender agreement in Russian and the case number restrictions on it in section 2. Section 3 first argues that gender is part of the decomposition of declension classes, and then decomposes the Russian declensions accordingly. In section 4, I turn to morphological ineffability. Section 5 presents the analysis of the core data and section 6 derives cases where conflicting features do not lead to a crash. I discuss implications of the analysis in section 7.

2 Semantic gender agreement in Russian

2.1 Basics

In Russian, some profession-denoting nouns are grammatically masculine but allow for feminine agreement if the referent is female (see Panov 1968, Mučnik 1971, Skoblikova 1971, Crockett 1976, Graudina et al. 1976, Corbett 1991, and Gerasimova 2019). *Vrač* 'doctor' is one such noun. In (1a), it indicates a female individual and can trigger attributive agreement either for its grammatical masculine gender or for its semantic feminine gender.[2] Example (1b) shows that both grammatical and semantic agreement are also possible on the predicate.[3]

(1)   a.   Xoroš-**ij**   / xoroš-**aja** vrač   prinimaet zavtra.
           good-M.SG.NOM good-F   doctor[I.SG.NOM] receives   tomorrow
           'The good doctor is available tomorrow.'

       b.   Vrač   prišël   / prišl-**a**.
           doctor[I.SG.NOM] came.M   came-F

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[2]I use the international scholarly system (Timberlake 2004: 24-27) to transliterate Russian data, with two exceptions required to ensure a more consistent notation of palatalization. First, ^{j} is used instead of ' to indicate palatalization before a consonant and in word-final position. Second, I also use ^{j} to indicate palatalization before *a* and *u*. Note, however, that palatalization is not marked before front vowels (i.e., in *Ci* and *Ce* syllables) as well as before *ë*.

[3]For the sake of simplicity, only the parts of examples that are relevant for the discussion are fully glossed. Glosses also do not represent syncretisms between cases and declension classes.

'The doctor came.'

In (2), two probes agreeing with the same noun bear distinct gender values and give rise to mixed agreement.

(2) Xoroš-**ij**   vrač   prišl-**a**.
     good-M.SG.NOM doctor[I.SG.NOM] came-F
     'The good doctor came.'

The set of masculine nouns that allow for feminine semantic agreement is naturally limited to nouns that have referents of different genders, but no separate form that could be used without negative connotations for female referents. Among this already fairly restricted group of nouns, feminine semantic agreement is widely attested and productive.[4]

All analyses of feminine agreement with grammatically masculine nouns agree that there is an additional feminine gender feature in the noun phrase, but differ with respect to where this feature is introduced. It may be on a dedicated functional projection (see Asarina 2009, Pesetsky 2013), on ϕP (see Sauerland 2004), on the D head (see Pereltsvaig 2006, Steriopolo & Wiltschko 2010, King 2015, Lyutikova 2015, Steriopolo 2019), on the Num head (see Landau 2016), on the noun (as in Smith 2015; 2017, Puškar 2017; 2018, Salzmann 2020), or on a nominal modifier directly (see Matushansky 2013, Caha 2019). The higher position of the feminine gender adopted in some of these approaches is motivated by height restrictions. First, feminine semantic agreement is impossible with low classifying adjectives:

(3) General^{j}n-**yj**   / *gerenal^{j}n-**aja**   direktor   op^{j}at^j kričit.
     general-M.SG.NOM   general-F.SG.NOM director[I.SG.NOM] again yells
     'The executive director is yelling again.'

Second, while the switch from masculine agreement on lower modifiers to feminine agreement on higher probes is (somewhat marginally) allowed, the reverse switch from feminine to masculine agreement is ruled out; cf. (4a) vs. (4b).

(4) a. $^?$Èt-**a**   nov-**yj**   vrač   vsë   pereputal-a.
         this-F.SG.NOM new-M.SG.NOM doctor[I.SG.NOM] everything mixed.up-F
         'This new doctor mixed everything up.'
     b. *Èt-**ot**   nov-**aja**   vrač   vsë   pereputal.
         this-M.SG.NOM new-F.SG.NOM doctor[I.SG.NOM] everything mixed.up.M
         'This new doctor mixed everything up.'

For now I will abstract away from the height restrictions (see references above for possible analyses) and will introduce a different type of restriction on semantic gender agreement in Russian – the case number restrictions.

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[4]Another way to indicate gender is to use construction *ženščina-X* 'woman-X'; for instance *ženščina-vrač* 'woman-doctor' or *ženščina-kosmonavt* 'woman-cosmonaut'. This construction, however, implies that the profession is not typical for women and is often accompanied by the modifier *pervyj* 'first' (see Piperski 2019). Agreement with such compounds shows the gender of the first member and is invariably feminine; see Graudina et al. (1976), Sitchinava (2011).

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2.2 Case number restrictions

Russian has six basic cases and two numbers, i.e., there are twelve cells in the nominal paradigm. Only a few of these forms allow for semantic feminine agreement with grammatically masculine nouns. As shown in examples above, feminine agreement is possible in the nominative singular; see also example (5).

(5) Xoroš-**aja**   vrač   prišl-**a**.
     good-F.SG.NOM doctor[I.SG.NOM] came-F
     'The good doctor came.'

Feminine agreement is ruled out if the noun is singular and has any case other than nominative. Examples in (6) show ungrammaticality of feminine agreement with a singular noun in the accusative, genitive, dative, locative, and instrumental case forms.

(6) a. vižu nov-**ogo**   / *nov-**uju**   vrač-a
         see new-M.SG.ACC   new-F.SG.ACC doctor-I.SG.ACC
         'see the new doctor'
     b. net nov-**ogo**   / *nov-**oj**   vrač-a
         no new-M.SG.GEN   new-F.SG.GEN doctor-I.SG.GEN
         'The new doctor is absent.'
     c. k nov-**omu**   / *nov-**oj**   vrač-u.
         to new-M.SG.DAT   new-F.SG.DAT doctor-I.SG.DAT
         'to the new doctor'
     d. o   nov-**om**   / *nov-**oj**   vrač-e
         about new-M.SG.LOC   new-F.SG.LOC doctor-I.SG.LOC
         'about the new doctor'
     e. s   nov-**ym**   / *nov-**oj**   vrač-om
         with new-M.SG.INS   new-F.SG.INS doctor-I.SG.INS
         'with the new doctor'

Gender agreement in Russian is, as a rule, restricted to the singular; that is, if a noun is plural, agreement on its modifiers realizes number and case but not gender. This is shown in (7), where a modifier agreeing with a masculine noun *stol* 'table' and with a feminine noun *dver^j* 'door' has exponents differing in gender in the singular, but the same exponent is used in the plural.

(7) a. nov-**yj**   stol   nov-**aja**   dver^j
         new-M.SG.NOM table[I.SG.NOM]   new-F.SG.NOM door[III.SG.NOM]
     b. nov-**ye**   stol-y   nov-**ye**   dver-i
         new-PL.NOM table-I.PL.NOM   new-PL.NOM door-III.PL.NOM

One exception to the absence of gender agreement in the plural is the modifier *ob-a/e* 'both-M/F'. It shows gender distinctions after agreement with a plural noun. Gender is marked by a vowel that precedes regular case and number exponents:

(8) *ob-o-ix* 'both-M-PL.LOC' vs. *ob-e-ix* 'both-F-PL.LOC'
     ob-o-im 'both-M-PL.DAT' vs. *ob-e-im* 'both-F-PL.DAT'

As observed by Pesetsky (2013), 'both' agrees in semantic feminine gender with a plural noun marked for cases other than nominative:

(9) a. vižu ob-**o**-ix   / ob-**e**-ix   vrač-ej
         see both-M-PL.ACC both-F-PL.ACC doctor-I.PL.ACC
         'see both doctors'
     b. net ob-**o**-ix   / ob-**e**-ix   vrač-ej
         no both-M-PL.GEN   both-F-PL.GEN doctor-I.PL.GEN
         'Both doctors are absent.'
     c. k ob-**o**-im   / ob-**e**-im   vrač-am
         to both-M-PL.DAT   both-F-PL.DAT doctor-PL.DAT
         'to both doctors'
     d. ob   ob-**o**-ix   / ob-**e**-ix   vrač-ax
         about both-M-PL.LOC   both-F-PL.LOC doctor-PL.LOC
         'about both doctors'
     e. s   ob-**o**-imi   / ob-**e**-imi   vrač-ami
         with both-M-PL.INS   both-F-PL.INS doctor-PL.INS
         'with both doctor'

The availability of feminine agreement in the nominative plural form cannot be tested: If the noun phrase is in the nominative position, 'both' is marked for nominative, while the noun is in a form that for *vrač* 'doctor', as well as for a majority of Russian nouns, is homophones with the genitive singular; see (10).

(10) Ob-**a**   / *ob-**e**   vrač-a   prišli.
      both-M.NOM   both-F.NOM doctor-I.PAUCAL came
      'Both doctors came.'

Despite the similarity with the genitive singular, the marking on the noun in (10) is often viewed as a separate form because for a number of nouns it differs from the genitive singular in its stress pattern (see Zaliznjak 2002). Also, adjectives modifying it show genitive plural, not genitive singular agreement; see (11).

(11) Ob-a   nov-**yx**   / *nov-**ogo**   vrač-a   prišli.
      both-M.NOM new-PL.GEN   new-M.SG.GEN doctor-I.PAUCAL came
      'Both new doctors came.'

All in all, the nature of this form is one of the widely discussed puzzles in Russian numeral constructions (see Babby 1987, Franks 1994, Pesetsky 2013, Ionin & Matushansky 2018, i.a.). Apart from 'both', the form appears with a group of small numerals – paucals. This group includes two further modifiers that mark gender distinctions: *dv-a/e* 'two-M/F' and *poltor-a/y* 'one.and.a.half-M/F'.

(12) dv-a   stol-a   dv-e   dver-i
      two-M.NOM table-I.PAUCAL   two-F.NOM door-III.PAUCAL

Unlike *ob-* 'both', *dv-* 'two' and *poltor-* 'one.and.a.half' mark gender distinctions only in the nominative. As for *ob-* 'both', feminine agreement with profession-denoting grammatically masculine

nouns is ungrammatical in this form; see (13).

(13) Dv-**a**   / *dv-**e**   vrač-a   prišli.
      two-M.NOM   two-F.NOM doctor-I.PAUCAL came
      'Two doctors came.'

Not all modifiers that require the paucal form show gender distinctions; for instance, *tri* 'three' and *četyre* 'four' do not mark gender. Modifiers that show gender agreement with non-singular nouns, at least in some of their forms – 'both', 'two', 'one.and.a.half' – can then be unified as having a dual meaning (see Ionin & Matushansky 2018: 180), and one might further hypothesize that gender agreement in Russian is in fact possible only with a dual but not with a plural noun. The hypothesis presupposes that Russian factually distinguishes between three numbers: singular, dual, and plural. This is not supported empirically: First, Russian does not have special dual inflection. The paucal form discussed earlier cannot be viewed, as its distribution is broader than that of dual modifiers. Second, gender and number can be realized in parallel only by exponents on the dual modifiers, but not on other modifiers (e.g., adjectives) in the same noun phrase. Realization of gender together with the plural also does not occur if the noun phrase just has dual meaning but the relevant modifiers are missing.

I conclude that despite a severely restricted set of modifiers that can show gender agreement with a plural noun, agreement on 'both' shows that gender agreement with a plural noun is in principle possible. Plural nouns thus must have gender features, but they are not realized morphologically in the presence of plural number. Realization of both gender and number turns out to be possible on dual modifiers due to their inherent number features (see section 5.4 for a formal analysis).

To sum up, this section has introduced case number restriction in semantic feminine agreement with grammatically masculine nouns in Russian. The data show that feminine agreement is possible in the nominative singular and in non-nominative plural forms.

2.3   Previous accounts of case number restrictions

Case number restrictions are mentioned in the literature (see Pereltsvaig 2006, Matushansky 2013, Gerasimova 2019), and Pesetsky (2013) and King (2015) aim to account for them. According to King (2015), feminine gender is introduced in the D head that is present in the nominative but absent in other cases. Thus, the ungrammaticality of feminine agreement in oblique cases is due to the lack of the projection that can bear feminine gender. The underlying assumption about the distribution of the DP layer is however not supported empirically. Furthermore, since semantic agreement is possible with oblique cases in the plural, this analysis does not derive the full set of data.

According to Pesetsky (2013), feminine gender is introduced in a functional projection above the noun and some of its modifiers. Gender probes that are higher in the structure then target this gender instead of the one on the noun. This derives the possibility of semantic feminine agreement. Feminine agreement can be ungrammatical for one of two reasons: the inability to realize [+fem] on class I nouns or the inability of a modifier to get the feminine feature. In the first case, the feminine feature appears on the noun because the case-assigning heads V, N, and P probe for gender and then assign it to the noun together with case. In the singular, the feminine feature on

class I nouns like *vrač* 'doctor' results in a realization failure. This explains the ungrammaticality of feminine agreement in (6). In the plural, the feminine gender does not lead to a crash (see (9)) because all nouns are assigned to class I, so that inflection realizing [+fem] is available. As for the nominative singular, where feminine agreement is allowed as well (see (5)), the noun does not receive the feminine feature: The D head that assigns nominative does not probe for gender and does not assign it to the noun. In the second case, modifiers do not show feminine agreement because they cannot access the feminine feature. This causes ungrammaticality in (10), where *ob-a* 'both-M' is in the nominative and the noun is marked for genitive. Pesetsky suggests that 'both' is merged lower than the feminine gender feature, so it agrees with the noun and gets masculine. Next, it head-moves to D, which has no gender to assign. Note that the incompatibility between feminine gender and class I declension cannot derive this example because the noun does not receive the feminine feature. It shows genitive, which under Pesetsky's approach is the intrinsic case that surfaces in the absence of a case assigner. This means that there is no higher head that assigns case and could introduce the feminine gender here.

This analysis shares with the account that I will develop the idea that the unacceptability of the feminine agreement on a modifier can arise due to a morphological conflict on a noun. However, in Pesetsky's analysis, morphological properties are insufficient to derive the full set of data, and additional factors such as properties of the D head are employed. I would like to contend that this analysis misses a generalization about the distribution of feminine agreement. In fact, all ungrammatical examples are due to the conflict in morphology, and this conflict is resolved by a syncretic exponent in all contexts where feminine agreement is allowed. Moreover, in Pesetsky, the incompatibility between the declension class of profession-denoting nouns that trigger semantic agreement and the feminine feature is assumed rather then derived.

Before turning to my account in sections 3 and 4, I will present two novel arguments showing that ungrammaticality stems from the inability to realize nominal inflection in morphology.

2.4 Syncretism

The first argument comes from the shape of nominal inflection. As mentioned above, Russian has 4 declension classes, and class membership often correlates with the gender of a noun. In particular, class I includes only grammatically masculine nouns. Class II predominantly consists of feminine nouns but also includes a group of animate masculine nouns.[5] Class III has feminine nouns, and class IV (labeled Ib by Timberlake (2004)) consists of neuter nouns. The relation between gender and declension in Russian is summarized in (14).

(14) Gender and declension in Russian

I	MASC
II	FEM, some animate MASC
III	FEM
IV	NEUTR

Table (15) presents the nominal inflectional exponents in Russian. The table does not show

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[5]Class II also includes so-called common gender nouns that can trigger agreement in masculine or in feminine gender depending on the gender of their referent. I defer discussion of these nouns till section 4, where a more elaborate empirical picture and an analysis will be presented.

regular phonological alternations. In the accusative and genitive plural of classes I and III, the choice between /ov/ and /ej/ is phonologically conditioned for nouns that end in a consonant that contrasts for palatalization. For all other nouns, the choice is subject to a set of idiosyncratic rules. Also, the exponents given in (15) are used by animate nouns. For them, accusative coincides with genitive in the singular of class I and in the plural. Inanimate nouns take inflection identical to the nominative in these forms.[6]

(15)   Nominal inflection in Russian

	SG				PL			
	I	II	III	IV	I	II	III	IV
	MASC	FEM, MASC	FEM	NEUTR	MASC	FEM, MASC	FEM	NEUTR
NOM	ø	a	ø	o	i	i	i	a
ACC	a	u	ø	o	ov/ej	ø	ov/ej	ø
GEN	a	y	i	a	ov/ej	ø	ov/ej	ø
LOC	e	e	i	e	ax	ax	ax	ax
DAT	u	e	i	u	am	am	am	am
INS	om	oj	ju	om	ami	ami	ami	ami

Profession-denoting nouns that trigger feminine agreement are, like all other nouns of class I, grammatically masculine. By going through the declensional exponents of Russian nouns, I will show that semantic gender agreement is grammatical if and only if a class I exponent is syncretic to an exponent of a class that includes feminine nouns.

In the singular, /ø/ is the nominative exponent in classes I and III. Note that although all nouns in class III end in a palatalized consonant, *š*, or *ž* in the nominative singular, palatalization is not a nominative singular exponent but a property of class III nouns. This can be shown by attaching suffixes that preserve the palatalization specification of the preceding consonant. The locative plural suffix /ax/ is one such affix.[7] Examples (16a-b) show that this affix retains the [±palatalized] feature of the final consonant of the root. In these examples, locative /ax/ is attached to class II nouns ending in a non-palatalized and in a palatalized consonant respectively. In both cases, the locative suffix does not affect the characteristics of the final consonant.

(16)   a.   [−palatalized]: *pčel-a* 'bee-II.SG.NOM' → *pčël-ax* 'bee-PL.LOC'
         b.   [+palatalized]: *kastrʲulʲ-a* 'pot-II.SG.NOM' → *kastrʲulʲ-ax* 'pot-PL.LOC'

The locative plural suffix /ax/ is attached in (17) to a class III noun, whose final consonant remains unchanged. This demonstrates that [+palatalized] is a feature of the root: Where it the

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nominative singular marker, it would not occur before this suffix.[8]

(17) [+palatalized]: *postel^j* 'bed[III.SG.NOM]' → *postel^j-ax* 'bed-PL.LOC'

As a result, the third class nominative singular inflection is /ø/, and it is syncretic to the corresponding exponent in class I. In the singular, exponents of the locative case are also segmentally identical in classes I and II. They differ however in accentual properties: The class II exponent is underlyingly stressed, while the class I exponent is not; see Melvold (1989: 21), and also Zaliznjak (2010: 141) for the same contrast between these two exponents in Old Russian[9], and Müller (2004), which analyzes them as distinct vocabulary entries on the basis of independent conceptual considerations. Note that the underlying stress on the class II exponent and its absence on the exponent of class I does not imply that the former affix is always stressed while the later never bears accent. It means that if these affixes are attached to stems with the same accentual characteristics, a resulting stress pattern will differ in some cases. Due to this suprasegmental differences, I conclude that the class I locative exponent is not syncretic to the exponent of class II.

Consequently, in the singular, the nominative is the only form where an exponent of class I is syncretic to an exponent from a declension class that contains feminine nouns, and this is also the only form where semantic feminine agreement is grammatical.

In the plural, class I exponents are identical to class III exponents in the accusative and genitive. Plural inflection also does not differentiate between classes in the locative, dative, and instrumental. Thus, in the plural, class I inflection is syncretic with the inflection of at least one class with feminine nouns in all non-nominative forms, and as shown in section 2.2, semantic agreement is grammatical in all these forms. As for the nominative plural from, exponents from classes I, II, and III are identical, so that semantic agreement is expected to be possible here as well. These data are however not available due to quirks in the syntax of the Russian noun phrase; see (10).

To sum up, all nouns that can trigger feminine agreement are grammatically masculine and belong to declension class I, which includes only masculine nouns. Feminine agreement is restricted to forms where exponents of this class are syncretic to exponents of class III, which has feminine nouns. Thus, the grammaticality of feminine agreement on a modifier depends on nominal inflection. This dependency indicates that the restrictions are due to the inflection on a noun.

2.5 Ellipsis

The conclusion from the previous section is further supported by nominal ellipsis data. As shown in the examples below, the case number restrictions do not hold if the noun is absent. Example (18) presents a minimal pair: In (18a), the noun is in the accusative singular form, and semantic feminine agreement is ungrammatical. In (18b), the noun is absent and feminine agreement is

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[8]To derive vowel-zero alternations in certain environments in Russian, it is sometimes assumed that the underlying form of class I and class III nominative singular inflection is a short vowel that is deleted later (see Lightner 1965, Pesetsky 1979). Given that this vowel is never overtly realized in this case, and palatalization is a property of a noun as argued above, there are no reasons to assume that vowels used as nominative singular inflection in classes I and III are different.

[9]According to Zaliznjak (2010), stress in contemporary Russian nominal inflection is better described by assigning nouns to one of twelve stress patterns, not by deriving the stress position from the underlying accentuation of a noun and an inflectional suffix. At the same time, roots and derivational affixes have underlying accentual properties, and stress in the derived forms is based on them. This makes such a system highly redundant.

allowed.

(18) a. Vse pacienty žalovalis^j na nov-**ogo** / *nov-uju vrač-a.
     all patients complained on new-M.SG.ACC new-F.SG.ACC doctor-I.SG.ACC
     'All patients complained about the new doctor.'

b. ... no vse pacienty žalovalis^j na nov-**ogo** / nov-**uju**.
     but all patients complained on new-M.SG.ACC new-F.SG.ACC
     '{Context: The previous doctor was great, while} all patients complained about the new one.'

The absence of the noun in (18b) is an instance of nominal ellipsis: The noun is present in the syntactic structure but not realized phonologically (see Merchant 2001, van Craenenbroeck & Merchant 2013, and Saab 2019 on nominal ellipsis). Evidence for this comes from (19)-(20). They show that the absent noun must be syntactically present for assignment of a Θ-role to its arguments as well as for idiosyncratic marking of its modifiers. The examples in (19) use the profession-denoting noun *redaktor* 'editor'. It can take an internal argument that indicates the object of editing. In (19a), this internal argument survives ellipsis of the noun by virtue of being focused and moving out of the ellipsis site. This shows that the phonologically absent noun can still assign a Θ-role to its argument and must therefore be present syntactically. The possessive modifier of the elided noun in (19a) shows feminine agreement.[10] Such agreement would be ungrammantical in the presence of the noun; compare (19b).

(19) a. Tekst-a u nas uže est^j redaktor, a **videor^jad-a** xotim
     text-I.SG.GEN by us already be editor[I.SG.NOM] but video-I.SG.GEN want
     peremanit^j **vaš-u**.
     poach your-F.SG.ACC
     'We already have the editor of the text but we want to poach your [editor] of video.'

b. My xotim peremanit^j vaš-**ego** / *vaš-u redaktor-a.
     we want poach your-M.SG.ACC your-F.SG.ACC editor-I.SG.ACC
     'We want to poach your editor.'

The example in (20a) demonstrates the availability of an idiosyncratic marking associated with the noun if it is elided. This examples contains the profession-denoting noun *repetitor* 'tutor'. The modifier indicating the tutor's specialization is introduced by the preposition *po*.

(20) a. Repetitor-a po russk-omu jazyk-u my uže našli, a **po**
     tutor-I.SG.ACC on Russian-M.SG.DAT language-I.SG.DAT we already found but on
     matematik-e iščem **nov-uju**.
     mathematics-II.SG.DAT search new-F.SG.ACC
     'We already found a Russian language tutor, but we are searching for a mathematics tutor.'

b. My iščem nov-**ogo** / *nov-uju repetitor-a.
     we search new-M.SG.ACC new-F.SG.ACC tutor-I.SG.ACC
     'We are searching for a new tutor.'

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[10]There are speakers who do not accept this example as grammatical. The reasons for this variation still remain to be determined.

The preposition *po* can be used with various professions to indicate specialization, but its use is nevertheless restricted to a subset of hypothetically possible professions; compare (21a) and (21b). The preposition is thus idiosyncratically related to a number of nouns and its presence under ellipsis argues for the presence of the noun in the structure. As in the previous case, the adjective modifying an elided noun in (20a) allows for feminine agreement, while such agreement is ungrammatical if the noun is present as in (20b).

(21) a. menedžer po turizm-u   jurist po semejn-ym   del-am
          manager   on tourism-I.SG.DAT   lawyer on familial-PL.DAT affair-I.PL.DAT
      b. *vrač   po glaz-am   *lingvist po sinaksis-u
          doctor on eye-I.PL.DAT   linguist on syntax-I.SG.DAT

The assignment of a Θ-role and the idiosyncratic marking on a modifier shows that the syntactic structure of a noun phrase with ellipsis and one without it must be parallel. This argues against the analyses under which the absence of a noun is derived by nominalization of an adjective (see Bošković & Şener 2014) or by the null pronouns (see Lobeck 1995). The possibility of semantic feminine agreement with an elided noun, and the impossibility of it with a pronounced one, shows that it is the realization of the noun that leads to the ungrammaticality of feminine agreement.

The examples so far have illustrated the grammaticality of feminine agreement when the elided noun is in the accusative singular. Examples (22)-(25) present minimal pairs for other contexts where feminine semantic agreement is not acceptable in the presence of the noun and demonstrate that feminine agreement is grammatical under ellipsis; see (22) for the genitive singular, (23) for the dative, (24) for the locative, (25) for the instrumental.

(22) a. Net tol^jko nov-**ogo**   / *nov-oj   vrač-a.
          No only   new-M.SG.GEN   new-F.SG.GEN doctor-I.SG.GEN
          'Only the new doctor is absent.'
      b. ... i   net tol^jko nov-**ogo**   / nov-**oj**.
          and no only   new-M.SG.GEN   new-F.SG.GEN
          '{Context: All doctors are gathered} and only the new one is absent.'

(23) a. Daša ne pojdët k nov-**omu**   / *nov-oj   vrač-u.
          Dasha not will.go to new-M.SG.DAT   new-F.SG.DAT doctor-I.SG.DAT
          'Dasha won't go to the new doctor.'
      b. ... i   ona ne pojdët k nov-**omu**   / nov-**oj**.
          and she not will.go to new-M.SG.DAT   new-F.SG.DAT
          '{Context: Dasha only trusts her usual doctor} and she won't go to the new one.'

(24) a. O   nov-**om**   / *nov-oj   vrač-e   my ničego ne znajem.
          about new-M.SG.LOC   new-F.SG.LOC doctor-I.SG.LOC we nothing not know
          'We don't know anything about the new doctor.'
      b. ... a   o   nov-**om**   / nov-**oj**   my ničego ne znajem.
          but about new-M.SG.LOC   new-F.SG.LOC we nothing not know
          '{Context: The previous doctor was great,} but we don't know anything about the new one.'

(25) a. Oni xot^jat obsudit^j èto s   nov-**ym**   / *nov-oj   vrač-om.
          they want discuss this with new-M.SG.INS   new-F.SG.INS doctor-I.SG.INS

'They want to discuss this with the new doctor.'

b. ... tak čto teperʲ oni xotʲat obsuditʲ èto s nov-**ym** / nov-**oj**.
   so that now they want discuss this with new-M.SG.INS new-F.SG.INS
   '{Context: The previous doctor did not help} so that now they want to discuss this with the new one.'

The examples in (26) show that ellipsis has no effect in cases where feminine agreement is grammatical in the presence of the noun. Example (26a) illustrates this for the nominative singular form, and (26b) for the accusative plural.

(26) a. Xoroš-**ij** / xoroš-**aja** (vrač) ne pridet.
         good-M.SG.NOM good-F.SG.NOM doctor[I.SG.NOM] not will.come
         '{Context: The bad doctor came, and} a good (doctor) will not come.'
      b. ... no pacienty žalujutja na ob-**o**-ix / ob-**e**-ix (vrač-ej).
         but patients complain on both-M-PL.ACC both-F-PL.ACC doctor-I.PL.ACC
         '{These doctors must be very good,} but the patients complain about both (doctors).'

To sum up: the case number restrictions do not apply if a noun is elided, even though such nouns are syntactically present. It is therefore the Vocabulary insertion of the noun that leads to ungrammaticality.

3 Gender in declension

3.1 The argument

In this section, we move from the data to how they inform our understanding of declension classes and their relation to gender. Existing approaches (also discussed in section 1) capture the correlation between class and gender in different ways. According to one view, gender is one of the features into which declension classes are decomposed, so that insertion of a nominal exponent that is traditionally considered class inflection in fact targets gender among other features (see Roca 1989, Harris 1991, Wiese 2004, Wunderlich 2004, Caha 2019; 2021). According to another view, declensions are either not decomposed, or decomposed into features other than gender (see Ralli 2000, Alexiadou 2004, Müller 2004, Alexiadou & Müller 2008, Kramer 2015, Gouskova & Bobaljik 2022). The relation between declension class and gender can be derived by implicational redundancy rules that supply class on the basis of gender or gender on the basis of class. Note that redundancy rules can also be used under the first view (see Roca 1989 and Harris 1991). The difference between the approaches is in whether redundancy rules are the only tool connecting gender and declension, and in whether other (formal or phonological) features are targeted by Vocabulary Insertion together with gender or instead of it. Another interesting perspective is offered by Arsenijević (2021), where in the spirit of Corbett (1982; 1991), it is argued that effects traditionally subsumed under the notion of gender can be derived from declension class and some semantic properties of nouns. Finally, some approaches that primarily rely on separate class features and essentially belong to the second type allow gender to participate in class inflection, but its usage is restricted to a few exponents (see Halle 1992; 1994, Aronoff 1994, Halle & Vaux 1998, Calabrese 2008, and Kučerová 2018).

The views above make different predictions about what a change to gender features on a noun leads to. If exponents are specified for gender directly, altering the gender specification on a noun will immediately affect insertion of exponents in several forms, but crucially the change might not encompass all cells of the paradigm. It will not apply to exponents that are used with nouns of different genders and are therefore underspecified for it. Case number restrictions on semantic gender agreement in Russian display such an effect.

Under semantic gender agreement, a grammatically masculine noun has a female referent and triggers feminine agreement. Feminine agreement clearly indicates the presence of a feminine gender feature in a noun phrase, and there is a near consensus in the literature that this feature is introduced in the extended projection of a noun, so that it can act as a goal for probes on nominal modifiers (see Pereltsvaig 2006, Asarina 2009, Steriopolo & Wiltschko 2010, Pesetsky 2013, King 2015, Lyutikova 2015, Smith 2015; 2017, Steriopolo 2019). Thus, semantic agreement presents a case of change in the gender specifications of a noun – the feminine gender feature is added. The data in the previous section also show that semantic gender agreement gives rise to case number restrictions, i.e., it is acceptable only in some cells of a paradigm. Ungrammatical forms are due to the inability to insert an inflectional exponent, and grammatical forms are characterized by syncretism of exponents used with masculine class I nouns and feminine class III nouns. These exponents are underspecified for gender.

Semantic gender agreement in Russian once again confirms the connection between declension class and gender: Insertion of a nominal class exponent becomes impossible in the presence of an additional gender feature. Furthermore, case number restrictions on semantic gender agreement are what is predicted if class exponents are directly specified for gender: Altering gender features results in ineffability unless exponents are underspecified for gender. This is because Vocabulary Insertion fails to provide an exponent for a node that contains contradictory features (masculine and feminine gender).

Let's now turn to how the observed effect differs from the predictions made by approaches where class exponents are not specified for gender or the use of gender is radically restricted to a few exponents. The connection between gender and declension could be viewed as accidental, but this position is obviously falsified by case number restrictions, because the change in gender features affects class inflection. Alternatively, there could be implicational rules that connect declension and gender. If so, altering the gender specification of a noun could potentially lead to a change in a class feature that is supplied by a rule and targeted by Vocabulary Insertion, so that the change in gender results in differences in nominal inflection.

To identify how the change in inflection might look, I will examine some rules that have been used to connect gender and declension (see Halle 1990, Halle & Marantz 1994, Halle 1992; 1994, Aronoff 1994, Halle & Vaux 1998, Kramer 2015, Kučerová 2018, Gouskova & Bobaljik 2022). These are redundancy rules that were originally proposed in phonology (see, for instance, Jakobson & Halle 1956 and Chomsky & Halle 1968: 171). They supply a new feature on the basis of features that are already present, but cannot replace existing features or insert a second feature of a given type. At the same time, as rules of Vocabulary Insertion in Distributed Morphology (see Halle 1997), they apply according to specificity: If a context for more than one rule is met, only the more specific one applies. Thus, one noun will never have more than one class feature if class features are inserted by such redundancy rules.

I will exemplify these properties by redundancy rules that were suggested for Russian in Aronoff (1994). That work suggests a system with three classes; see (27). It differs from the

one assumed here in that class I includes both masculine and neuter nouns. Differences in the inflection of masculine and neuter nouns are captured by the inclusion of both class and gender in the specifications of some affixes. Most realization rules are conditioned by the features I, II, and III, which directly correspond the three classes. The relation between declension and gender is derived by the three redundancy rules given in (28).

(27) <u>Classes in Russian (see Aronoff 1994)</u>
    I   MASC, NEUTR
    II   FEM, some animate MASC
    III FEM

(28)   a.   [N, Feminine] → [class II];
        b. [N] → [class I];
        c. [N, class III] → [Feminine].

The rule in (28a) applies to feminine nouns, the one in (28b) to all nouns. If a noun is feminine and does not have a class feature, the contexts for both rules are met, so that one might expect insertion of two declension class features, but in fact, only the class II feature — the more specific one — is inserted. Thus, specificity ensures that the rules in (28) never insert two class features simultaneously. The rules also do not apply if a class feature is prespecified. For instance, class III nouns have a declension feature from the lexicon, and the rule in (28b) does not apply to them even though the context for its application is formally met.

The inability to supply two class features or alter an existing specification is by no means unique to the approach by Aronoff (1994). It is a defining property of class-filling redundancy rules used to relate gender and declension; among others see Halle & Vaux (1998: 224) for an elsewhere rule in Latin, and Kramer (2015: 239) for such a rule in Spanish. This inability to insert two class features defines what effect a change in gender might have on inflection in this type of approach.

There are two scenarios. In the first, an additional gender feature has no effect on the declension class feature. This will be the case, for instance, if a noun is prespecified for class or if the usual class is inserted because the redundancy rule that supplies it is more specific. Because nominal inflection only targets class features, which are not altered by changes to a noun's gender, there will be no difference in inflection.

In the second, the class feature is inserted based on a new gender. Inflection from another declension will then be used throughout the paradigm, but there will be no source of ineffability in any cells of the paradigm.

To sum up, in approaches that only employ feature-filling redundancy rules to capture the connection between gender and declension class, an additional gender feature either does not lead to a change in inflection, or triggers insertion of different exponents in all forms. This differs from the case number restrictions arising in the presence of an additional gender feature in Russian, where the feature leads to ungrammaticality in some forms, but regular exponents are used in others.

Finally, for the sake of the argument, let's assume that contrary to the nature of redundancy rules two class features are inserted. Since inflection under semantic gender agreement is impossible unless classes I and III are syncretic, the inserted class features must be I and III.[11] To derive the data, conflicting class features must lead to a realization failure in forms where these classes

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[11]Note that existing approaches relying on implicational rules supply class II on the basis of the feminine gender, while class III is prespecified on nouns (see Aronoff 1994, Halle 1994). This is justified by the composition of Russian lexicon: Class II is significantly larger than class III.

require different inflection, and exponents syncretic between the two classes must be unspecified for class altogether to resolve the conflict.

The complete absence of class features in syncretic forms makes it impossible to derive forms where two or more declensions have the same inflection. For instance, classes I and III are syncretic in the accusative and genitive plural, as are classes II and IV. Class I is also the same as class IV, and class II the same as class III, in the genitive singular. If identical inflection is analyzed as true syncretism rooted in features, as is required for the syncretism between classes I and III to account for case number restrictions, both the class I/III exponent and the class II/IV exponent must be unspecified for class. But then, the distribution between them cannot be derived. Thus assumptions that are required to account for resolution by syncretism under semantic gender agreement make it impossible to account for the distribution of nominal exponents in general.

This further indicates that approaches employing primitive class features are poorly equipped to capture transparadigmatic syncretism, i.e., syncretism between declension classes. For such approaches, one could assume that all instances of transparadigmatic syncretism are in fact accidental homophony, but case number restrictions provide clear evidence that this type of syncretism is not different from, e.g., case syncretism in its capacity to resolve feature conflicts and must therefore be reflected in the feature specifications of vocabulary items (see Zaenen & Karttunen 1984, Ingria 1990, Dalrymple & Kaplan 2000, Asarina 2011, and also Pullum & Zwicky 1986 on ambiguity vs. neutrality).

I conclude that case number restrictions are predicted if Vocabulary Insertion of class exponents targets gender features directly, but not if gender and declension class are unrelated, or related by feature-filling redundancy rules. Semantic gender agreement in Russian therefore provides an argument for gender being present in the decomposition of class.

3.2 Decomposition of declension classes in Russian

This section provides a decomposition of Russian's declension classes. Since gender participates in the decomposition, I will start by laying out my assumptions concerning it.

I suggest that the three genders in Russian are formed by two binary features: [±fem] and [±masc]. Grammatically feminine nouns are [+fem][−masc], grammatically masculine nouns are [−fem][+masc], and neuter nouns are [−fem][−masc].

(29)   Gender features in Russian

FEM	[+fem][−masc]
MASC	[−fem][+masc]
NEUTR	[−fem][−masc]

Out of the two gender features only [±fem] is targeted by declension class exponents. As shown in the introduction, gender alone is not enough to fully determine declension class, i.e., it must be accompanied by other features. I propose that declension classes arise from the combination of a gender feature and an idiosyncratic feature of a nominal stem $[\pm\alpha]$.[12] Note that declension classes are here understood as groups of nouns that take the same set of inflectional exponents. Four such groups of nouns – declensions – in Russian are identified by four possible combinations of two features: [±fem] and $[\pm\alpha]$. Under this analysis, the features $[\pm\alpha]$ are analogous to the primitive class features ([I], [II], etc.) in that their main function is to determine the

declension class of a noun. The difference is that they do not determine classes by themselves but are targeted by Vocabulary Insertion together with gender. Decomposition of declension classes into gender and a formal feature allows us to capture the relation between gender and declension class in a way that was argued for in the previous section. It also allows us to group the declensions into natural classes, which will be necessary for the analysis of case number restrictions.

The table in (30) provides specifications for Russian's declension classes. Class I, made up of masculine nouns, and class IV, made up of neuter nouns share the $[-\text{fem}]$ feature. Classes II and III include feminine nouns, and both have $[+\text{fem}]$. Classes I and III share $[+\alpha]$. Classes II and IV have $[-\alpha]$.

(30)   Class feature specifications in Russian

Class	Gender of nouns	Decomposition
I	MASC	$[-\text{fem}][+\alpha]$
II	FEM, some animate MASC	$[+\text{fem}][-\alpha]$
III	FEM	$[+\text{fem}][+\alpha]$
IV	NEUTR	$[-\text{fem}][-\alpha]$

Exponents that appear only with nouns of one class (e.g., the class III instrumental exponent /ju/) have a full class specification, while exponents syncretic between declensions are underspecified for features that differentiate between these classes. For instance, the instrumental exponent /om/ is used with class I as well as class IV nouns that differ in their values for $[\alpha]$. This means that /om/ is underspecified for $[\pm\alpha]$. Exponents syncretic between classes II and III are also underspecified for $[\pm\alpha]$. Suffixes shared by nouns from classes I and III or classes II and IV are specified for $[\pm\alpha]$ but not for $[\pm\text{fem}]$. Note that although the features participating in decomposition are different, the natural classes produced this way match those suggested by Müller (2004) and Alexiadou & Müller (2008).[13]

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[12]Caha (2021) argues that features like $[\pm\alpha]$ as well as the primitive declension class features I/II/III/etc., being arbitrary and language-specific, cannot be in Universal Grammar; their presence weakens grammatical theory. I see no reason why formal features like $[\pm\alpha]$ or primitive class features cannot be part of Universal Grammar. First, they are arbitrary because semantic or phonological properties of lexemes do not fully determine the distribution of these features. This is perfectly natural for grammatical features, cf. grammatical gender that also has no clear correlate and is arbitrary in the same way. Second, these features are language-specific because they determine nominal inflection in specific languages. Neither nouns in, for instance, class I nor the inflection of this class in one language share properties with class I nouns or their inflection in another language. This is again not surprising given that nouns in class I do not share anything but their membership in this class, and the correspondence between grammatical features and their phonological realization has been known to be arbitrary as least since Saussure's "Course in General Linguistics". I conclude that formal features like $[\pm\alpha]$ or I/II/etc. can be in UG. Their shape and number must be established by typological research. A task of native speakers is to identify how many of them are present in their language and how they correspond to observed inflection patterns. In this way, these features acquire their language-specific use.

[13]Here, I will show how the exceptional cases presented in fn. 6 can be handled under this analysis of declension classes. First, following Caha (2019: 270-273), I assume that neuter nouns such as *strem^{j}a* 'stirrup' and *brem^{j}a* 'burden' belong to class IV but have two different exponents: /a/ in the nominative and accusative and /i/ in the genitive, locative, and dative. The nominative and accusative also lack the /Vn/ augment that is added to roots of these nouns in other forms. I assume that this is because /a/ is a special exponent that is contextually specified as being used with these ten nouns, and it realizes case and number as well as features responsible for insertion of the augment in other forms. Second, contrary to traditional approaches I assume that the noun *put^j* 'way' belongs to class I. The difference between *put^j* and regular class I nouns can be reduced to one exponent /i/ that appears in the genitive, dative, and locative singular. This, as well as the use of /i/ with neuter nouns discussed above, can be derived by introducing

Recall that profession-denoting nouns that allow for semantic gender agreement belong to class I. According to this decomposition of declension classes, class I nouns realize [−fem] by their inflection. This is line with the grammatical gender ([−fem][+masc]) of such nouns, but contradicts their semantic gender ([+fem][−masc]). As a result, nouns like *vrač* 'doctor' have conflicting values of the [fem] feature. This makes the derivation ineffable unless an exponent regularly used in a given form is underspecified for gender and consequently syncretic between classes I and III.

Note also that class II, which is decomposed into [+fem] and [−α], includes a small group of nouns that denote male individuals and trigger masculine agreement in syntax. I suggest that this is an instance of deponency, a phenomenon known due the group of Latin verbs that show passive morphology but are active in syntax. Generally, deponency is defined as a mismatch between syntactic properties and morphological realization (see Embick 2000, Stump 2007, and Müller 2013). Class II masculine nouns are deponent because they are masculine ([+masc][−fem]) syntactically but realize a contradicting [+fem] feature morphologically. Thus, nouns have contradicting [−fem] and [+fem] features, exactly as profession-denoting class I nouns that give raise to semantic agreement. Masculine class II nouns are however not subject to case number restrictions; realization of their inflection is not dependent on the transparadigmatic syncretism and underspecification of exponents. The difference between the two cases is due to the position of conflicting features in the structure and will follow from the analysis of morphological ineffability developed later in section 4.

3.3   Further evidence: Augmentative *išč*

The decomposition of the Russian declensions in (30) is further supported by the interaction between class and gender in nouns with the augmentative suffix *išč*.[14] If the affix is attached to a noun, the class of the derived noun is dependent on the original gender of the noun (see Švedova 1980: 213, Timberlake 2004: 146). In (31), the suffix appears on feminine (i.e., [+fem]) nouns that belong to different declension classes: (31a) shows a noun from class II, (31b) a noun from class III. In both cases, the derived noun is feminine and bears class II inflection.

(31)   a.   knig-a (FEM, class II) 'book' → kniž-išč-a (FEM, class II)
       b.   gr^{j}az^j (FEM, class III) 'mud' → gr^{j}az^j-išč-a (FEM, class II)

In (32), *išč* attaches to non-feminine (i.e., [−fem]) nouns. The base in (32a) is originally masculine and belongs to class I; the base in (32b) is neuter and belongs to class IV. In both cases the noun with suffix *išč* is neuter and inflects like a class IV noun.

(32)   a.   golos (MASC, class I) 'voice' → golos-išč-e (MASC, class IV)
       b.   vino (NEUTR, class IV) 'vine' → vin-išč-e (NEUTR, class IV)

If *išč* is specified for [−α] but has no gender feature, the declension of a derived noun follows directly from the combination of this formal feature and the gender of the original noun: [−α] and

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an exponent that is used in the context of these roots. Third, variation in nominative and genitive plural forms can be captured by Readjustment Rules that overwrite original feature specifications and allow the use of inflection from other declensions.

[14]As pointed out by Steriopolo (2014) and Gouskova & Bobaljik (2022), the augmentative *išč* co-exists with a homophonous nominalizer with a broad 'place' meaning that can attach to stems that are not full words by themselves.

[+fem] in (31) produce the feature specification of class II, $[-\alpha]$ and $[-\text{fem}]$ in (32) that of class IV.[15]

To sum up, in this section I have discussed which effect a change in the gender specifications of a noun can have on its inflection, and shown that the pattern predicted by approaches where inflection targets gender directly is the one that is empirically borne out under semantic gender agreement in Russian. Then, I presented a decomposition of the declension classes in Russian under which classes are built from two binary features: gender $[\pm\text{fem}]$ and a purely formal feature $[\pm\alpha]$. In the next section, I turn to the morphological realization of these features, and show how syncretism can resolve conflicts between them.

4 Ineffability in morphology

4.1 Subset Principle

I adopt the framework of Distributed Morphology, according to which structures produced in syntax undergo morphological realization in a post-syntactic component (see Halle & Marantz 1993; 1994, Harley & Noyer 1999, Siddiqi 2010). In the course of this, Vocabulary Insertion matches bundles of features in terminal nodes to vocabulary items. Vocabulary Insertion applies according to the Subset Principle proposed by Halle (1997); see (33). The this principle requires that the features of a vocabulary item match as many features present in a syntactic terminal as possible and that a vocabulary item not introduce new features. Thus, the vocabulary item's features must either be identical to the features on the terminal or form a proper subset of them.

(33)　　Subset Principle (Halle 1997:128)
　　　　The phonological exponent of a vocabulary item is inserted into a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the vocabulary item contains features not present in the morpheme. Where several vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen.

Vocabulary Insertion that is based on the Subset Principle cannot fail because of the presence of an additional feature. To illustrate this, consider the following case: Node N_1 bears the features $[+\alpha][-\beta]$. Vocabulary Insertion finds an item I_1 with the features $[+\alpha][-\beta]$, that is, the vocabulary item matches all features on the node. Node N_2 differs from N_1 in that it also has feature $[f]$. The type and the value of $[f]$ play no role. It can be $[-\alpha]$, $[+\beta]$, or a new feature $[\pm\gamma]$. If there is a vocabulary item I_2 specified as $[+\alpha][-\beta][f]$, it will be inserted into N_2 in accordance with the Subset Principle. If there is no such item, I_1 will be chosen: The features of this vocabulary item are a subset of the features on N_2, and the selected item is most specific for a given context. Thus, if there is a new feature on a node, and there is no more specific item that would match this new
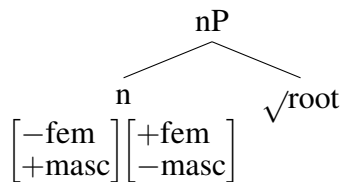
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[15]In colloquial Russian, attachment of the suffix *išč* can be also produce class IV neuter nouns independently of the class and gender of the original noun; cf. *knig-a → kniž-išč-e*. I suggest that in this case the suffix also has the gender specification $[-\text{fem}][-\text{masc}]$, so that derived nouns are fully determined by features of the suffix, and the gender of the original noun plays no role.

feature too, the less specific vocabulary item (I_1 in this example) will be inserted. Independently of the identity of the new feature, Vocabulary Insertion succeeds.

At the same time, morphological ineffability that is due to the inability to provide an exponent for a node with conflicting features, and that gets resolved by a syncretic exponentm is attested for various phenomena cross-linguistically; see, e.g., Groos & van Riemsdijk (1981) on matching in free relatives, Taraldsen (1981) on topicalization, Zaenen & Karttunen (1984), Dalrymple et al. (2009), Asarina (2011) on right node raising, Schütze (2003), Bhatt & Walkow (2013), Bjorkman (2016), Coon & Keine (2020) on predicative agreement with multiple targets, and Citko (2005), Hein & Murphy (2019) on ATB-movement. This poses a dilemma: On the one hand, data show that ungrammaticality in some forms stems from a failure during morphological realization. On the other hand, the model of morphology does not provide a reason for a crash.[16] Most of the approaches that model how conflicting features lead to ineffability share two ideas. First, conflicting features cannot co-exist within a single feature structure. They have to be stored in two separate structures that in turn can co-exist on one node, as shown in (34) for conflicting gender features.

(34)   Conflicting gender features

nP
├── n
│ $\begin{bmatrix} -\text{fem} \\ +\text{masc} \end{bmatrix}\begin{bmatrix} +\text{fem} \\ -\text{masc} \end{bmatrix}$
└── √root

Second, Vocabulary Insertion applies to each feature structure separately. A derivation converges only if the outputs happen to be phonologically identical and fails otherwise. Outputs are the same if the inserted vocabulary item is underspecified for conflicting features and is hence syncretic between at least two cells in a paradigm. Analyses differ in their hypotheses about the formal reason for the crash. For instance, Asarina (2011) postulates that distinct insertion rules cannot spell out material on a single node. Bjorkman (2016) suggests that two different vocabulary items on one node are morphologically uninterpretable. Coon & Keine (2020) propose that ineffability arises because morphology must pick one of the two selected items but it cannot do so. Essentially, all of these approaches impose a well-formedness constraint on the result of Vocabulary Insertion.

Cases of morphological ineffability with semantic gender agreement in Russian differ in that a noun does not have two full feature structures. It has two conflicting gender specifications but only one number feature and only one case feature. Encountering a similar issue, Asarina (2011) proposes that all features except for conflicting ones must be copied from one feature structure and inserted into another.

Such a duplication of features is not required under the approach developed by Hein & Murphy (2019). They propose an operation of intersection. It applies to two feature structures and produces one structure. If the original structures have features with conflicting values, the value for this feature will be absent in the unified feature structure: $[+\text{fem}] \cap [-\text{fem}] \Rightarrow [\text{fem}]$. Vocabulary Insertion of an item that is specified for this feature then introduces a new feature and thereby violates the Subset Principle. The analysis was developed for ATB-movement in Polish

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[16]Being interpretive in nature, Distributed Morphology encounters the same problem in the analysis of paradigm gaps; see Halle (1973), Baerman (2011).

and, given the vocabulary items provided for Polish interrogative pronouns by Hein & Murphy (2019), it correctly derives the data. However, the analysis runs into problems if there is a default maximally underspecified vocabulary item, because it can be always inserted without introducing new features.

In what follows, I will present an analysis of morphological ineffability. Ineffability arises in my approach, as in most others, because of an inviolable well-formedness constraint on morphological realization, but while other approaches introduce conceptually novel constraints, mine needs nothing beyond the independently necessary subset principle.

4.2   Interleaving Lowering and Vocabulary Insertion

I suggest that a derivation is ineffable if the subset relation between features of a vocabulary item and a terminal that holds when Vocabulary Insertion applies is destroyed later in the derivation. This is possible if Vocabulary Insertion can be interleaved with Lowering. The analysis is based on two major assumptions.

First, the Subset Principle is refashioned from a procedural restriction on Vocabulary Insertion into a constraint that holds after a vocabulary item is inserted; see Arregi & Nevins (2012) for other examples of inviolable constraints in Distributed Morphology.

(35)   Subset Principle (revised)
        For a vocabulary item with feature set F_1 inserted in a terminal with feature set F_2, $F_1 \subseteq F_2$, and there is no vocabulary item with feature set F_3 so that $F_1 \subset F_3 \subseteq F_2$.

Second, Vocabulary Insertion is interleaved with Lowering. According to the standard view morphology consists of multiple modules, so that the whole structure or a sizable part of it (e.g., a phase as understood in Chomsky 2000, Chomsky 2001) is subject to rules from one block (e.g, morphological structure rules), and only after operations from this block have applied to the top-most node can operations from the next block (e.g., Vocabulary Insertion) start applying. They process the structure anew, starting from the bottom (see Halle & Marantz 1993, Arregi & Nevins 2012). As a consequence, all Lowering operations apply before Vocabulary Insertion. Here, I at least partially depart from this modular architecture within morphology and suggest that morphology is a single module that processes a structure supplied by syntax from bottom to top. Morphological operations are still ordered so that, for instance, Impoverishment of a feature on a node applies before Vocabulary Insertion into this node, but Vocabulary Insertion into the bottom node does not have to wait till Impoverishment has applied to the top node; cf. Noyer (1992), Halle (1997), and González-Poot & McGinnis (2006) on interleaving Vocabulary Insertion and Fission, Chung (2009) on Vocabulary Insertion and Fusion, and also Dobler et al. (2011) and Piggott & Travis (2017) on Vocabulary Insertion and head movement. In result, Lowering can counterfeed Vocabulary Insertion. Lowering is a head-to-head downward movement that alters structure lower in the tree (see Embick & Noyer 2001). Vocabulary Insertion, on the other hand, applies bottom-up (see Bobaljik 2000, Myler 2017). Under this approach, Lowering can target nodes to which Vocabulary Insertion has already applied. If Lowering is followed by Fusion that unifies two sister nodes into one (see Halle & Marantz 1993 and also Kramer 2016a for examples of Fusion applying after Lowering), this makes it possible to change features on a node after Vocabulary Insertion has applied to it.
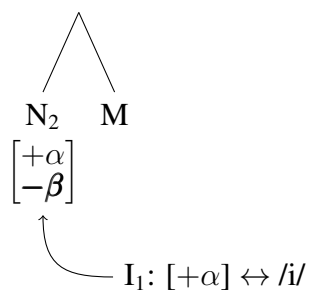
Consider the following derivation. In the first step in (36), node N_2 undergoes Vocabulary Insertion, and vocabulary item I_2 is inserted. The features of I_2 fully match the features on the terminal. After this, morphological computation proceeds to node N_1. It has to lower to N_2, as shown in (37). After Lowering, N_1 and N_2 undergo Fusion. I assume that in the course of Fusion the feature set of one node is incorporated into the feature set of another. If the original sets have the same feature, but with contradictory values, they cannot be both in the resulting feature set, but the more marked feature overwrites the less marked one; cf. the ban against conflicting features in well-formed feature sets in (Stump 2001:41). For binary gender features, I assume that a feature with a positive value is more marked than a feature with a negative value, i.e., $[+\beta]$ overwrites $[-\beta]$; cf. Noyer (1992), Nevins (2007), as well as Weisser (2018) on markedness with binary features. The resulting structure is provided in (38). Here, the Subset Principle is violated because the inserted vocabulary item is specified for $[-\beta]$, which is not present on the node. Vocabulary Insertion applies to terminals only once, so that the inserted exponent cannot be altered at this stage; see Embick (2010: 23). The violation of the Subset Principle leads to a crash.

(36)   Vocabulary Insertion   (37)   Lowering   (38)   Subset principle – *
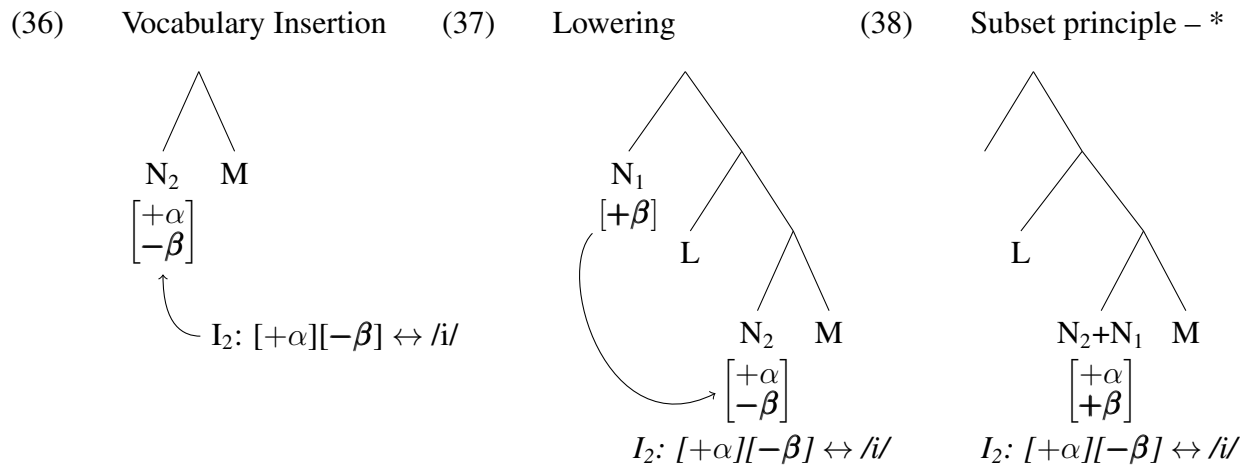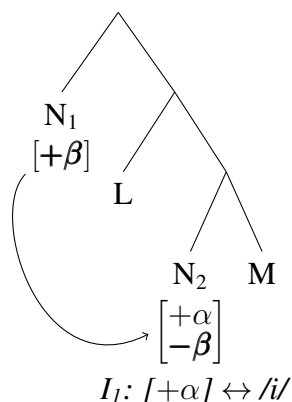

While here and in what follows I will talk about this process of more marked features replacing less marked ones as overwriting, it can in fact be formalized as a maximally general impoverishment rule $[+\alpha, -\alpha] \rightarrow [+\alpha]$ that applies whenever the premise is met.

A similar derivation does not lead to ineffability if there is no vocabulary item fully matching the features of N_2, and a vocabulary item I_1 underspecified for $[\pm\beta]$ is inserted; see (39). In this case, a change in the value of $[\beta]$ does not result in a violation of the Subset Principle; see (41). The feature conflict is resolved by a syncretic underspecified exponent.
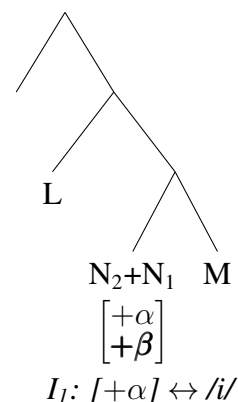
(39) Vocabulary Insertion   (40) Lowering   (41) Subset principle – OK

$$N_2 \quad M$$
$$\begin{bmatrix} +\alpha \\ -\beta \end{bmatrix}$$
$$I_1: [+\alpha] \leftrightarrow /i/$$

$$N_1 \quad L$$
$$[+\beta]$$
$$N_2 \quad M$$
$$\begin{bmatrix} +\alpha \\ -\beta \end{bmatrix}$$
$$I_1: [+\alpha] \leftrightarrow /i/$$

$$L$$
$$N_2{+}N_1 \quad M$$
$$\begin{bmatrix} +\alpha \\ +\beta \end{bmatrix}$$
$$I_1: [+\alpha] \leftrightarrow /i/$$

While this model allows Lowering to counterfeed Vocabulary Insertion, it is clearly not the case for all instances of Lowering. First, in some cases Lowering is not always followed by Fusion; see McFadden (2004) on Lowering in largely agglutinative Finno-Urgic languages. Second, the current application of Lowering is peculiar in that the targeted node is already specified for features introduced by Lowering and Fusion. I suggest that if the node is not yet specified for features that will be introduced by Lowering, the feature set on the node might be viewed as incomplete, and Vocabulary Insertion will be postponed until the feature set on the node is full. As a result, application of Vocabulary Insertion before Lowering is limited to configurations where lowering features are already present on a node, albeit with different values.

5   Case number restrictions derived

In this section, I will show how the analysis applies to the case number restrictions on semantic gender agreement in Russian. Recall that if a grammatically masculine noun trigger feminine agreement, morphology fails to realize inflection on the noun unless an exponent regularly used in a given form is underspecified for gender and thereby syncretic between classes I and III. Table (42) (repeated here from (15)) shows nominal inflection in Russian. Exponents that can be used under semantic gender agreement are boldfaced. Nominative plural exponents are italic because the analysis predicts they can resolve gender conflicts, but this cannot be tested empirically.

(42)   Nominal inflection in Russian

	SG				PL			
	I $\begin{bmatrix} -\text{fem} \\ +\alpha \end{bmatrix}$	II $\begin{bmatrix} +\text{fem} \\ -\alpha \end{bmatrix}$	III $\begin{bmatrix} +\text{fem} \\ +\alpha \end{bmatrix}$	IV $\begin{bmatrix} -\text{fem} \\ -\alpha \end{bmatrix}$	I $\begin{bmatrix} -\text{fem} \\ +\alpha \end{bmatrix}$	II $\begin{bmatrix} +\text{fem} \\ -\alpha \end{bmatrix}$	III $\begin{bmatrix} +\text{fem} \\ +\alpha \end{bmatrix}$	IV $\begin{bmatrix} -\text{fem} \\ -\alpha \end{bmatrix}$
NOM	**ø**	a	**ø**	o	*i*	*i*	*i*	a
ACC	a	u	ø	o	**ov/ej**	ø	**ov/ej**	ø
GEN	a	y	i	a	**ov/ej**	ø	**ov/ej**	ø
LOC	e	é	i	e	**ax**	**ax**	**ax**	**ax**
DAT	u	e	i	u	**am**	**am**	**am**	**am**
INS	om	oj	ju	om	**ami**	**ami**	**ami**	**ami**

5.1   Nominal inflection in Russian

Nominal inflection in Russian cumulatively realizes case, number, class (i.e., gender and $[\pm\alpha]$), and sometimes animacy. These features are often assumed to originate in different projections. For instance, grammatical gender is on *n* (see Kramer 2015; 2016b), number is on Num (see Ritter 1991), and case originates outside the noun phrase. In Russian, all these features are realized by a single exponent, and assuming that Vocabulary Insertion targets terminals (see Halle & Marantz 1993, Halle 1997), this means that they have to be gathered on one node. Nouns in Russian stay low: They follow modifiers such as numerals, adjectives, and demonstratives in the regular case. Thus, features realized by nominal inflection must also be low in the noun phrase structure. I suggest that they are on the *n* head,[17] which is inherently valued with some nominal features (e.g, gender) and has unvalued probes for others (e.g., number and case).[18]

In addition to their grammatical gender, nouns can optionally have a semantic gender. Semantic gender in Russian is widely argued to be introduced by a higher functional projection in the nominal structure (see Sauerland 2004, Pereltsvaig 2006, Asarina 2009, Steriopolo & Wiltschko 2010, Pesetsky 2013, King 2015, Lyutikova 2015, and Steriopolo 2019). Evidence for the higher position of semantic gender in Russian comes from the height restrictions illustrated in section 2.1. They show, first, that low classifying modifiers cannot agree in semantic gender and, second, that agreement in the grammatical masculine gender can switch to the semantic feminine gender but not the other way around. I further assume that the position of a projection with semantic gender is not fixed as there is no consistent height, at which grammatical agreement obligatory switches to semantic agreement. Semantic gender differs from other features introduced higher in the nominal structure in that at the point when it is introduced, the *n* head is already specified for (grammatical) gender. As a result, unlike other nominal features that originate in higher projections, semantic gender does not appear on the *n* head via Agree but lowers to *n* in the morphological component.

Structure (43) shows the relevant part of a noun phrase as it is built by syntax. Here and throughout, I do not include animacy because all discussed nouns are animate. I also abstract away from the decomposition of case; see Müller (2004), Wiese (2004), or Caha (2019) for some options.

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[17]As pointed out by an anonymous reviewer, inflection follows a nominalizer if the latter is overt. There are various ways to derive this. First, it can be assumed that there is an additional Fission operation that applies if the *n* head has separate lexical content and splits the inflectional features to another head. Second, inflectional features might be hosted by the Infl head that is immediately above the *n* head. Independently of which solution is adopted, for the sake of simplicity, I will present nominal inflectional features on *n* as suggested here.

[18]Alternatively, all nominal features originate on *n*, and higher projections have unchecked probes; see Privizentseva (2021). This facilitates the analysis of nominal concord because modifiers can cyclically agree with the noun.

(43)   Noun phrase structure

$$
\begin{bmatrix} +\text{fem} \\ -\text{masc} \end{bmatrix}
$$

nP

n

$$
\begin{bmatrix} \text{ins} \\ -\text{fem} \\ +\text{masc} \\ +\alpha \\ +\text{sg} \end{bmatrix}
$$

√doctor

In (43), the *n* head is specified for the grammatical gender [−fem][+masc] and the formal feature [±α]. These features are often idiosyncratically associated with nominal roots, but roots are acategorial and featureless (see Marantz 1997, Acquaviva 2009) so that *n* cannot acquire these features via Agree with them. Generally, how to ensure a correct pairing between roots and their idiosyncratic features without endowing roots with features is a long-standing question in Distributed Morphology. The relation between roots and such features is usually conceived of as licensing, but unless analyzed as Agree, licensing remains a vague, undefined concept. I suggest that the correct distribution of features on *n* is derived by two mechanisms. First, since syntax does not refer to [±α], this feature can be introduced in morphology by a rule as in (44) that inserts positively valued feature in the presence of some roots and the negatively valued feature in the presence of others; cf. Embick (2010) and Kramer (2015) for post-syntactic insertion of a class feature.[19]

(44) $n \rightarrow n_{[+\alpha]}$ / [__ {√doctor, √table ...}]

Second, gender features that are required in syntax for agreement cannot be inserted postsyntactically. I suggest that the connection between nouns and genders follows from selection in syntax. Depending on the gender features, *n* heads have different selectional restrictions. For instance, the *n* head with [−fem][+masc] selects for √doctor, among other roots. This approach requires differentiating roots in syntax, a position argued for by Harley (2014) for independent reasons.

5.2   Conflicting gender features in Russian noun phrase

Everything is now in place to derive the case number restrictions on semantic gender agreement in Russian. Let us consider the instrumental singular form. Morphology processes the structure bottom-up and starts by supplying the vocabulary item /vrač/ for the root √doctor. After this, the derivation proceeds to the next higher node – *n*. It bears case [ins], number [+sg], grammatical

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[19]As this topic is largely orthogonal to the current proposal, I will present the derivations as if there are no internal locality domains within a noun phrase. The analysis is, however, in principle compatible with category-defining heads being cyclic; see Embick (2010). The *n* head and the root are then in different spell-out domains, but the interaction between them required, for instance, for the assignment of class features remains possible due to the Activity Corollary proposed by Embick (2010: 56, example (45)). It postpones the inaccessibility of the spelled out material till yet another phrase head is merged into the structure.

gender [−fem][+masc] and [+α]. Russian has three instrumental singular exponents, listed in (45). The vocabulary item in (45a) is syncretic between classes I and IV, so it has the [−fem] feature but is underspecified for [±α]. The vocabulary item in (45b) realizes inflection on class II nouns and has a full feature specification: [+fem][−α]. Similarly, the vocabulary item in (45c) is used only with class III nouns and realizes [+fem][+α]. Out of these vocabulary items, only the one in (45a) can be inserted without a violation of the Subset Principle. The other exponents are specified for [+fem], which the *n* head does not have at this stage. Vocabulary Insertion is illustrated in (46).

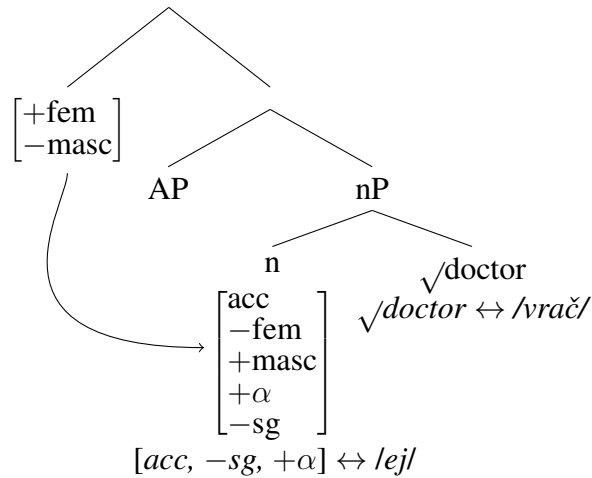(45) a. $\begin{bmatrix} \text{ins} \\ -\text{fem} \end{bmatrix} \leftrightarrow$ /om/;

    b. $\begin{bmatrix} \text{ins} \\ +\text{fem} \\ -\alpha \end{bmatrix} \leftrightarrow$ /oj/;

    c. $\begin{bmatrix} \text{ins} \\ +\text{fem} \\ +\alpha \end{bmatrix} \leftrightarrow$ /ju/.
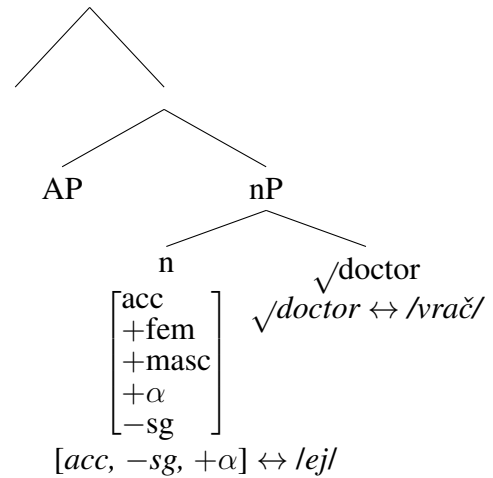
(46) Vocabulary Insertion into *n*
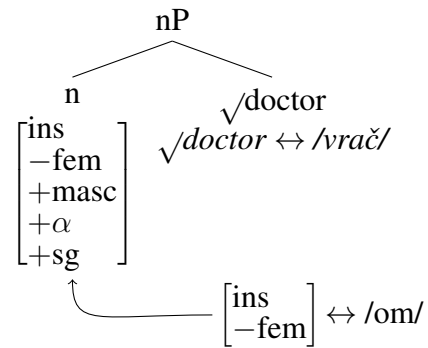
If the noun does not have semantic gender features, nominal inflection is essentially finished at this point. However, if a noun triggers semantic feminine agreement, there are feminine features higher in the structure. Belonging to features of the noun, semantic gender has to lower to the *n* head and be incorporated into its feature structure; see (47). When two nodes fuse, the new more marked feature [+fem] overwrites the less marked [−fem] feature on *n* as well as the less marked [−masc] that lowers as part of the semantic gender gets overwritten by a more marked [+masc] already present in the *n* head.[20] The resulting structure is given in (48). After Lowering and Fusion, features on *n* are changed so that features of the inserted vocabulary item are not in the subset relation to them anymore: the vocabulary item is specified for [−fem], which is now absent on the node. The violation of the Subset Principle and inability to exchange the already inserted exponent leads to the realization failure.

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[20]Cf. Slioussar & Malko (2016) for an experimental study on markedness of gender features in Russian.

(47) Lowering of feminine gender   (48) After Fusion, Subset Principle – *

$$\begin{bmatrix} +\text{fem} \\ -\text{masc} \end{bmatrix}$$

AP   nP

n $\sqrt{}$doctor

$$\begin{bmatrix} \text{ins} \\ -\text{fem} \\ +\text{masc} \\ +\alpha \\ +\text{sg} \end{bmatrix}$$ $\sqrt{}$*doctor* ↔ */vrač/*

[*ins*, −*fem*] ↔ */om/*

AP   nP

n $\sqrt{}$doctor

$$\begin{bmatrix} \text{ins} \\ +\text{fem} \\ +\text{masc} \\ +\alpha \\ +\text{sg} \end{bmatrix}$$ $\sqrt{}$*doctor* ↔ */vrač/*

[*ins*, −*fem*] ↔ */om/*
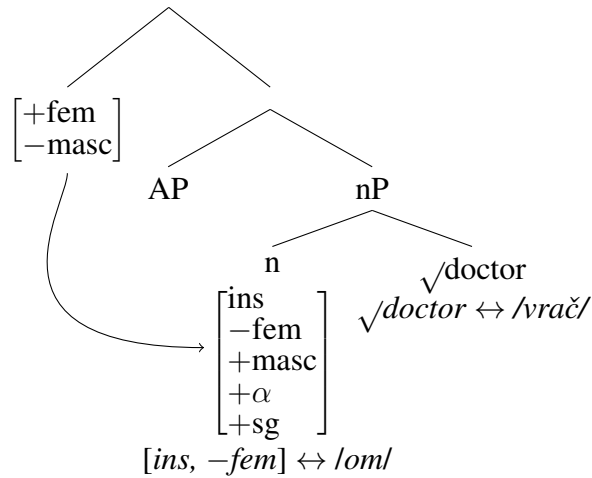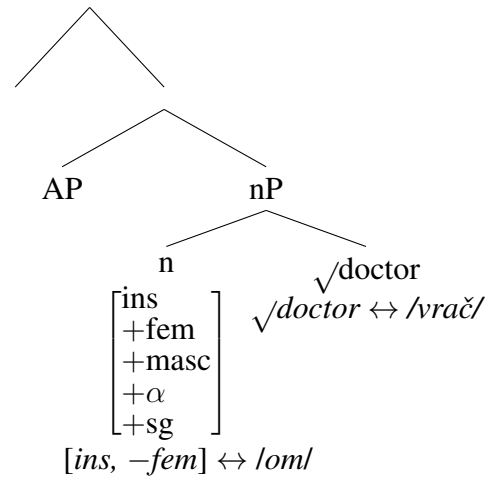
Thus, the morphological component fails to realize the instrumental singular inflection on the grammatically masculine class I noun in the presence of the semantic feminine gender. Given that this feminine feature enables feminine agreement in syntax, this derives the restrictions on semantic feminine agreement with masculine profession-denoting nouns in the instrumental singular as well as in other forms where inflection is specified for gender.

A derivation with a semantic gender feature that does not result in ineffability is illustrated in (50)-(52) on the basis of the accusative plural. In this form, the noun *vrač* takes the exponent /ej/ that is syncretic between classes I and III. Another vocabulary exponent used in accusative plural contexts is /ø/, which is syncretic between classes II and IV. Both affixes are specified for [$\pm\alpha$] and underspecified for [$\pm$fem]; see (49). As shown in (50), the vocabulary item /ej/ with the feature [$+\alpha$] is chosen to realize inflection on the masculine class I noun.

(49) a. $\begin{bmatrix} \text{acc} \\ -\text{sg} \\ +\alpha \end{bmatrix}$ ↔ /ej/;

b. $\begin{bmatrix} \text{acc} \\ -\text{sg} \\ -\alpha \end{bmatrix}$ ↔ /ø/.

(50) Vocabulary Insertion into *n*

nP

n $\sqrt{}$doctor

$$\begin{bmatrix} \text{acc} \\ -\text{fem} \\ +\text{masc} \\ +\alpha \\ -\text{sg} \end{bmatrix}$$ $\sqrt{}$*doctor* ↔ */vrač/*

$\begin{bmatrix} \text{acc} \\ -\text{sg} \\ +\alpha \end{bmatrix}$ ↔ /ej/
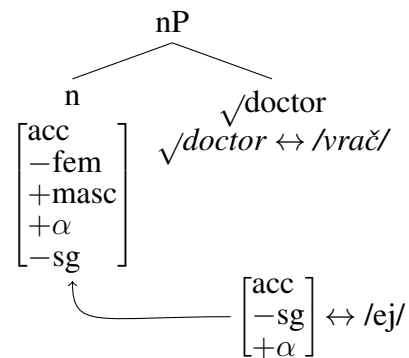
As in the previous derivation, if the noun has feminine gender higher in the structure, it must lower to *n* and fuse with its feature structure; see (51). Again, the new [+fem] feature replaces the less marked feature [−fem], but unlike in the previous case, the vocabulary item is not specified for gender here, so that the change in gender features cannot lead to a violation of the Subset Principle; see (52). Thus, the vocabulary item inserted earlier is legitimate, and morphological realization succeeds.

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(51) Lowering of feminine gender   (52) After Fusion, Subset Principle – OK
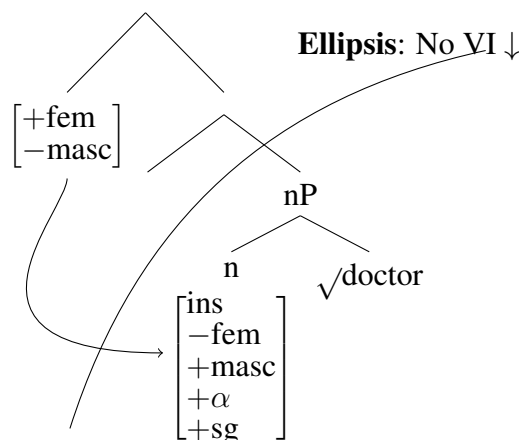
$\begin{bmatrix} +\text{fem} \\ -\text{masc} \end{bmatrix}$

AP   nP

n   √doctor

$\begin{bmatrix} \text{acc} \\ -\text{fem} \\ +\text{masc} \\ +\alpha \\ -\text{sg} \end{bmatrix}$ √*doctor* ↔ */vrač/*

[*acc, −sg, +α*] ↔ */ej/*

$\begin{bmatrix} +\text{fem} \\ -\text{masc} \end{bmatrix}$

AP   nP

n   √doctor

$\begin{bmatrix} \text{acc} \\ +\text{fem} \\ +\text{masc} \\ +\alpha \\ -\text{sg} \end{bmatrix}$ √*doctor* ↔ */vrač/*

[*acc, −sg, +α*] ↔ */ej/*

To sum up, morphological ineffability occurs if a more marked feature is incorporated into the feature structure of a terminal after Vocabulary Insertion has applied to it, and the inserted vocabulary item is specified for a feature that is altered.

5.3 Resolution by ellipsis

As shown in section 2.5, case number restrictions do not hold under ellipsis even though the syntactic structure is the same as in elliptical contexts (see also Merchant 2001, van Craenenbroeck & Merchant 2013, and Saab 2019). My analysis locates the source of case number restrictions in morphology. This makes it possible to derive the observed effect: Under ellipsis, a noun and its inflection are not realized, so that the Subset Principle is vacuously satisfied independently of the presence of the conflicting semantic gender. Let's consider the implementation on the basis of the instrumental singular form, whose ineffability in the presence of feminine semantic gender was derived in the previous subsection. As shown in (53), the difference is that part of the nominal structure is not phonologically realized under ellipsis. I assume that the elided nominal constituent in Russian is an nP and that material within the ellipsis site is exempt from Vocabulary Insertion.

(53) nP-ellipsis

Ellipsis: No VI ↓

$\begin{bmatrix} +\text{fem} \\ -\text{masc} \end{bmatrix}$

nP

n   √doctor

$\begin{bmatrix} \text{ins} \\ -\text{fem} \\ +\text{masc} \\ +\alpha \\ +\text{sg} \end{bmatrix}$

The feminine semantic gender feature is introduced above the ellipsis site but lowers onto the *n* head despite the ellipsis (pace Saab & Lipták 2016). As in the derivation without ellipsis, this creates a configuration under which features on the *n* head are overwritten later in the derivation, but as Vocabulary Insertion does not apply to *n*, material in this node cannot violate the Subset Principle. Thus, if the noun is elided, semantic gender can be freely introduced into the noun phrase structure and trigger semantic agreement on nominal modifiers.

5.4 Gender agreement on modifiers

For the sake of completeness, in this section I will briefly outline how mixed gender agreement in Russian can be analyzed. I assume that agreement in the noun phrase is derived via Agree in syntax (see Carstens 2001; 2020, Baker 2008, Landau 2016, Ingason & Sigurðsson 2017). Nominal modifiers have probes for gender, number, and case. These probes are initially located on a head in the projection of a modifier (e.g., on *a*) and then project to the phrase level (as in Béjar & Rezac 2009, Carstens 2016, and Keine & Dash 2022), where they c-command the nP.

The structures in (54)-(55) focus on gender agreement. The structure in (54) illustrates a modifier that is introduced below the semantic gender feature. Its gender probe agrees with the grammatical gender feature on the *n* head because the semantic gender feature is not yet present in the structure. The structure in (55) contains a modifier that is above the semantic gender feature. The gender probe on this modifier agrees with the semantic gender because it is closer than the grammatical gender. This derives the unidirectional switch from the grammatical masculine to the semantic feminine agreement.[21] Note that agreement in syntax cannot be affected by Lowering of the semantic gender to the *n* head: Lowering applies later in the morphological component and therefore counterfeeds all syntactic operations, including Agree.

(54)   Masculine agreement   (55)   Feminine agreement
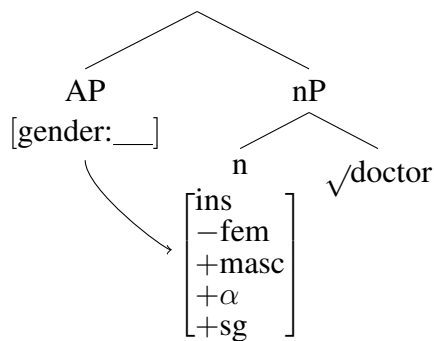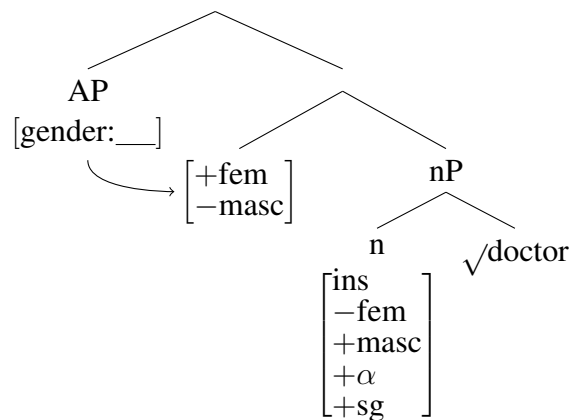
In the plural, differences in gender are not realized on the vast majority of nominal modifiers,

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[21]The absence of feminine agreement on low classifying adjectives can be derived by assuming that there is a lower threshold on where the semantic gender feature can be introduced. Following Asarina (2009), such a threshold might be motivated semantically: The semantic gender feature characterizes the individual that is denoted by the noun phrase, but low classifying adjectives specify the task that the profession relates to and for this reason must be introduced below the semantic gender.

but as this restriction does not encompass all modifiers, nouns in the plural must still have gender features. As a consequence, gender probes on modifiers are also valued for gender in plural contexts. Non-realization of gender distinctions on nominal modifiers in the presence of a plural feature is a morphological effect, and it can be derived in a number of ways. First, this can simply be due to the underspecification of morphological exponents. The feature specifications of vocabulary items could have either gender or number features but not both. The realization of number in plural contexts is preferred over the realization of gender, for instance, due to a feature hierarchy (cf. Noyer 1992) that would render vocabulary items specified for one feature more specific than those specified for another. Second, a more systematic analysis of gender neutralization can be implemented by an impoverishment rule as in (56). This rule deletes gender features on nominal modifiers, e.g., adjectives in the presence of $[-\text{sg}]$.

(56) $a \begin{bmatrix} \pm\text{fem} \\ \pm\text{masc} \end{bmatrix} \rightarrow a \ / \ [-\text{sg}]$

One modifier that consistently realizes gender and plural features is *ob-* 'both'. Recall, however, that even in this case gender and plural features are not realized by one exponent; gender is marked by a vowel that precedes regular adjectival plural inflection: *ob-o-ix* 'both-M-PL.ACC' vs. *ob-e-ix* 'both-F-PL.ACC'. In section 2.1, I have suggested that these exceptional properties of 'both' arise because the modifier has an inherent number feature. I assume that the difference between the singular and the plural in Russian is derived by $[\pm\text{sg}]$, where $[+\text{sg}]$ corresponds to singular and $[-\text{sg}]$ corresponds to plural. The modifier 'both' gets $[-\text{sg}]$ due to agreement with a plural noun, but it also has an inherent number feature $[+\text{min(inal)}]$. The features $[-\text{sg}]$ and $[+\text{min}]$ together produce the dual meaning of this modifier (cf. Noyer 1992, Harbour 2008; 2014; 2016). I suggest that $[-\text{sg}][+\text{min}]$ specification triggers Fission, as the result of which the gender feature and $[-\text{sg}]$ end up on different terminal nodes, as shown in (57). This derives the realization of the gender distinctions despite agreement with a plural noun.

(57)   Gender and number agreement on 'both'
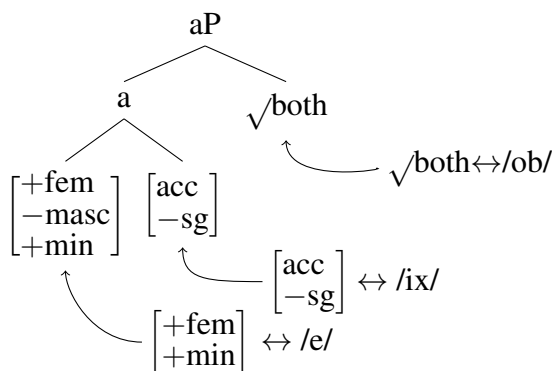
5.5 Summary

This section has presented the analysis of case number restrictions on semantic gender agreement with profession-denoting nouns in Russian. Building on empirical arguments from syncretism and ellipsis, the analysis locates the source of the restrictions in the morphological realization of the

noun. Nominal exponence traditionally viewed as class inflection in fact targets gender features on the *n* head. In addition to the grammatical gender feature on *n*, profession-denoting nouns have a semantic gender feature introduced higher in the structure. The semantic gender feature integrates into the feature structure on *n* and grammatical gender feature [−fem] gets overwritten by [+fem]. As morphology is viewed as a single module that processes the structure from the bottom to the top, Lowering of the higher gender feature applies after the lower *n* head has undergone Vocabulary Insertion. If an inserted exponent is specified for gender, this leads to a violation of the Subset Principle, which must hold between the features of an inserted exponent and features on a terminal node throughout the derivation. The ungrammaticalitiy of semantic gender agreement in this analysis comes from the feminine semantic gender feature itself, not from the application of Agree that underlies semantic gender agreement.

6 Feature conflicts without ineffability

The analysis in the previous section shows how conflicting gender features in the noun phrase can lead to morphological ineffability. In this section, I will consider a number of other cases in the Russian noun phrase in which conflicting gender features do not lead to ungrammaticality. I will show that these cases are different because the conflicting gender features are integrated into the feature structure on the *n* head before it undergoes Vocabulary Insertion. In result, Vocabulary Insertion and the Subset Principle target an already revised feature structure.

The data come from class II masculine nouns. According to my decomposition of Russian's declension classes, class II realizes [+fem]. At the same time, this class contains a small group of masculine nouns such as *muščina* 'man', *deduška* 'grandfather', *dʲadʲa* 'uncle', and *junoša* 'young man'. Example (58) shows that the noun *muščina* 'man' takes class II exponents, and example (59) shows that it triggers masculine agreement. Unlike profession-denoting class I nouns, masculine class II nouns do not allow for semantic agreement, so that there is no evidence for the presence of [+fem] in syntax.

(58) muščin-a   muščin-u   muščin-oj   muščin
      man-II.SG.NOM   man-II.SG.ACC   man-II.SG.INS   man[II.PL.GEN]

(59) Ét-**ot**   star-**yj**   muščin-**a**   prišël   pozdno.
      this-M.SG.NOM   old-M.SG.NOM   man-II.SG.NOM   came.M   late
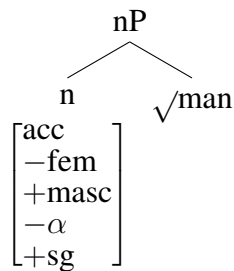   'This old man came late.'

In section 3.2, I suggest that this is an instance of deponency: The morphology of these nouns does not match their syntactic behavior. They show masculine features in syntax but realize feminine features in morphology. I suggest that these nouns indeed bear the features [−fem][+masc] in syntax, and [+fem] is inserted in morphology. Insertion of the latter feature is due to morphological rule (60). The inserted feature must be incorporated into the feature structure on *n*, where it overwrites the less marked [−fem] feature. As semantically feminine class I nouns, masculine class II nouns have conflicting gender features, and the more marked feature overwrites the less marked one, but this case differs from the derivations in the previous section in that conditions for a change of gender on *n* are created by a node below the *n* head. This ensures that the resolution of conflicting features that leads to a change in gender takes place before Vocabulary Insertion applies

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to the *n* head. Consequently, a vocabulary item that matches the altered feature set will be selected.
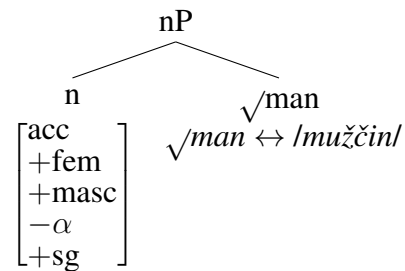
(60)   n → n$_{[+fem]}$ / [__ {√man, √grandfather ...}]^{22}

The derivation of masculine class II nouns is shown in (61)-(63). The structure in (61) shows a noun phrase before morphological computation. The *n* head has masculine gender. The structure is processed bottom-up: First, Vocabulary Insertion applies to the root. Next, [+fem] is inserted into the *n* head in accordance with rule (60); see (62). It overwrites the less marked [−fem] feature.

(61)   Noun phrase

$$
\begin{array}{c}
nP \\
\diagup\diagdown \\
\end{array}
$$

n
$$\begin{bmatrix} acc \\ -fem \\ +masc \\ -\alpha \\ +sg \end{bmatrix}$$
√man

(62)   Overwriting by [+fem]

$$
\begin{array}{c}
nP \\
\diagup\diagdown \\
\end{array}
$$

n
$$\begin{bmatrix} acc \\ +fem \\ +masc \\ -\alpha \\ +sg \end{bmatrix}$$
√man
√*man ↔ /mužčin/*

Finally, Vocabulary Insertion applies to *n* (see (63)), and the vocabulary item for class II with both [+fem] and [−α] is inserted. The features on *n* are not changed after this, and realization succeeds.^{23}

(63)   Vocabulary Insertion into *n*

$$
\begin{array}{c}
nP \\
\diagup\diagdown \\
\end{array}
$$

n
$$\begin{bmatrix} acc \\ +fem \\ +masc \\ -\alpha \\ +sg \end{bmatrix}$$
√man
√*man ↔ /mužčin/*

$$\begin{bmatrix} acc \\ +fem \\ -\alpha \end{bmatrix} ↔ /u/$$

<hr/>
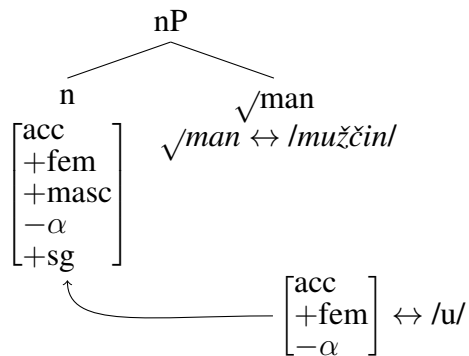
^{22}Gender can thus be introduced in syntax or in morphology. This might be viewed as a weakening the status of gender as a syntactic feature. However, since under the current approach gender features on nouns are targeted by Vocabulary Insertion, gender features are already both syntactic and morphological. One cannot view gender as a purely morphological feature because it participates in syntactic agreement relations.

^{23}Under this analysis, the deponency of a noun is essentially determined by a contextual restriction of the rule in (60) that lists all such nouns. The reduction of deponency to essentially idiosyncratic properties of stems is common place in existing approaches to it. Some analyses are, however, more systematic than others, because they turn out to be general enough to make predictions about the behavior of the relevant stems with respect to other properties (see, for instance, Grestenberger 2018). The analysis developed here potentially also makes predictions of this type: Since [+fem] replaces [−fem] in morphology, the analysis predicts that deponent nouns must pattern with masculine nouns in syntax but with feminine nouns in morphology. It remains an open question whether one can test this prediction in Russian, and what syntactic and morphological processes beyond nominal concord and Vocabulary Insertion one might use to do so.

To sum up, the difference between gender conflicts that can lead to ineffability in morphology and those that do not follows from the timing of Vocabulary Insertion and a change of features on the *n* head. Given the bottom-up organization of morphology, this in turn follows from the positions where conflicting features are introduced.

This is further confirmed by another small group of nouns in Russian that allows for variability in gender agreement – the so-called common gender nouns (see Švedova 1980: 464-466 on Russian, but also, e.g., Wechsler & Zlatić 2000, Alsina & Arsenijević 2012 on similar effects in Serbo-Croatian). In Russian, common gender nouns belong to class II and differ from regular nouns of this class in that agreement with them is determined by the gender of their referent. As shown by Iomdin (1980), common gender nouns in Russian are not a homogeneous class. Depending on their properties, they can be divided into three types.

The first type includes nouns that syntactically do not have a default gender. These nouns trigger feminine agreement if they denote a female individual (see (64a)) and masculine agreement if the referent is male (see (64b)). A mismatch between the gender of the referent and agreement in syntax is ruled out. Irrespective of masculine or feminine agreement, such nouns are inflected for exponents of class II (see (65)), that is, they realize [+fem] by their inflection.

(64) a. Ja znal ét-**ogo**   nesčastn-**ogo**   sirot-**u**.
          I   knew this-M.SG.ACC poor-M.SG.ACC orphan-II.SG.ACC
          'I knew this poor (male/*female) orphan.'
      b. Ja znal ét-**u**   nesčastn-**uju**   sirot-**u**.
          I   knew this-F.SG.ACC poor-F.SG.ACC orphan-II.SG.ACC
          'I knew this poor (female/*male) orphan.'

(65) sirot-a   sirot-u   sirot-oj   sirot
      orphan-II.SG.NOM   orphan-II.SG.ACC   orphan-II.SG.INS   orphan[II.PL.GEN]

I suggest that these nouns have no grammatical gender on *n* in syntax. Instead, the *n* head has gender probes that agree with a higher semantic gender. The feature [+fem] that is realized by nominal inflection is introduced by rule (60). If the semantic gender is masculine, the more marked [+fem] inserted in morphology overwrites it. If semantic gender is feminine, then gender inserted in morphology just coincides with it. Insertion of a second gender feature is triggered by the root, which is lower than *n*, and it feeds Vocabulary Insertion of the nominal exponent.

The second type consists of nouns with default masculine gender. Such nouns can trigger masculine agreement independently of the gender of the referent (see (66a)); and feminine agreement is optionally possible only if the referent is female; see (66b). Inflectional exponents belong to class II (see (67)), and this does not depend on agreement or gender of the referent.

(66) a. Naš-**ego**   byvš-**ego**   starost-**u**   zovut Maša / Van^ja.
          our-M.SG.ACC former-M.SG.ACC prefect-II.SG.ACC call   Masha / Vanja
          Our former prefect is called Masha (female name) / Vanja (male name).
      b. Naš-**u**   byvš-**uju**   starost-**u**   zovut Maša / *Van^ja.
          our-F.SG.ACC former-F.SG.ACC prefect-II.SG.ACC call   Masha / *Vanja
          Our former prefect is called Masha (female name) / *Vanja (male name).

(67) starost-a   starost-u   starost-oj   starost
      prefect-II.SG.NOM   prefect-II.SG.ACC   prefect-II.SG.INS   prefect[II.PL.GEN]

These nouns have masculine gender features ([−fem][+masc]) on the *n* head. Feminine gender features ([+fem][−masc]) if present are in a higher nominal projection. Despite having masculine gender in syntax, these nouns realize [+fem] by their class II inflection. As in the previous case, the feature [+fem] is inserted by a rule that applies in the presence of certain roots. The added [+fem] feature overwrites the less marked [−fem] on the *n* head, and Vocabulary Insertion applies next. The semantic feminine gender lowers later in the morphological derivation, but this does not change the features on *n* because it already has marked gender features.

The third type of common gender nouns are those with default feminine gender. This is also the gender realized by nominal inflection; see (68). These nouns allow for feminine agreement regardless of the gender of their referent; see (69a). If the denoted individual is masculine, these nouns can optionally trigger masculine agreement; see (69b).

(68) zanud-a   zanud-u   zanud-oj   zanud
      bore-II.SG.NOM   bore-II.SG.ACC   bore-II.SG.INS   bore[II.PL.GEN]

(69) a. Brat   / sestra Peti   – izvestn-**aja**   zanud-**a**.
          brother / sister Petja's known-F.SG.NOM bore-II.SG.NOM
          Petja's brother / Petja's sister is a known bore.

      b. Brat   / *sestra Peti   – izvestn-**yj**   zanud-**a**.
          brother / *sister Petja's known-M.SG.NOM bore-II.SG.NOM
          Petja's brother / *Petja's sister is a known bore.

In this case, the *n* head has grammatical feminine gender, and this gender is realized by the nominal inflection. Masculine gender is introduced in a higher nominal projection. Vocabulary Insertion applies to *n* before morphology reaches the node with semantic gender. Consequently, Lowering and Fusion counterfeed Vocabulary Insertion, as with semantically feminine class I nouns. However, this does not lead to ineffability, because the lowered [−fem] feature is less marked than the [+fem] feature already present on the *n* head. The lowered [+masc] overwrites [−masc] on *n*, but this feature does not participate in the decomposition of class, and nominal exponents are not specified for it.

The table in (70) summarizes the patterns of gender conflicts and their analyses.

(70)   Nouns with conflicting gender features

I	hybrid nouns *vrač* 'doctor'		• [−fem] on the *n* head; • semantic [+fem] gender higher; • Lowering of [+fem] counterfeeds VI
	deponent nouns *muščina* 'man'		• [−fem] on the *n* head; • [+fem] is inserted in the context of the root and feeds VI
II	common gender nouns	no default *sirota* 'orphan'	• no gender on the *n* head; • semantic [+fem] or [−fem] higher; • [+fem] is inserted in the context of the root and feeds VI; • Lowering of semantic gender counterfeeds VI but *n* already has marked [+fem]
		default masculine *starosta* 'prefect'	• [−fem] on the *n* head; • semantic [+fem] higher; • [+fem] is inserted in the context of the root and feeds VI; • Lowering of semantic [+fem] counterfeeds VI but *n* already has marked [+fem]
		default feminine *zanuda* bore	• [+fem] on the *n* head; • semantic [−fem] higher; • Lowering of semantic [+fem] counterfeeds VI but *n* already has marked [+fem]

7   Discussion

This paper makes two claims that are intended to reach beyond the analysis of specific phenomena in the syntax and morphology of Russian. This concluding section explores the scope and limitations of these claims.

The first claim is about the relation between gender and declension class. I have proposed that sets of inflectional exponents identifying declension classes in fact realize gender together with a formal feature of a stem. Note that this approach is not reductionist in that it does not aim to fully reduce declension to gender (for instance, by fully getting rid of formal class features) or gender to declension (as, e.g., Corbett 1982 or Arsenijević 2021). Nevertheless, the approach ties gender and declension together more tightly than redundancy rules do. This raises the question of whether such an approach can apply to other languages where gender and declension are correlated but not in one-to-one correspondence.

Let me outline some candidates. One is Spanish. Roca (1989) and Harris (1991) provide analyses under which nominal inflection in Spanish is derived from gender and essentially phonological properties of nouns. Such approaches are often criticized for being circular because phonological properties they rely on should in fact follow from class. If phonological properties were replaced by formal features, declension class inflection in Spanish can be viewed as targeting gender plus a formal feature, as in Russian. Another candidate is Latvian. For this language, Halle (1992) postulates classes A and B that largely correspond to masculine and feminine nouns. Both classes include several sub-classes whose differences and similarities are derived from formal features. Thus, it seems that nominal inflection in Latvian is also susceptible to an analysis under which 'class' exponents target gender together with a number of formal features. Further candidates come from languages for which the decomposition of class was argued for independently of gender (see Müller 2004, Alexiadou & Müller 2008). One of these languages is Greek, where gender is also strongly related to class, so that one of the formal features suggested in decomposition might turn out to be a gender feature.

Due to the tighter relation between class and gender in the approach I have developed for Russian, its extension to other languages might require treating some groups of nouns as exceptional, as is, for instance, the case for masculine class II nouns in Russian. Whether the account then remains plausible will naturally depend on a number of such exceptions. Ultimately, I argued that by including gender in the feature specifications of exponents in Russian that are traditionally thought to target declension classes, we can better explain empirical facts about the language. Similarly, the ultimate testing ground for similar analyses in other languages should be whether they allow a better understanding of empirical patterns, be it unexpected ungrammaticality under certain combinations of gender features or syncretisms between declensions with nouns of the same gender.

The second claim in this paper is about ineffability in morphology: Ineffability can arise because a feature can be integrated into a feature structure that has already undergone Vocabulary Insertion, which can cause a violation of the Subset Principle. Before developing a new account of morphological ineffability in section 4.2, I briefly reviewed existing approaches to it in Distributed Morphology and discussed why they cannot applied to case number restrictions in Russian. The proposal of the new account raises a reverse question: Can this new analysis be naturally extended to other instances of ineffability in morphology? Or to put it in more general terms: Can all attested cases of morphological ineffability be reduced to a single source?

It seems to me that all currently attested instances of ineffability in morphology can be roughly divided into two types. The first type includes patterns that can be unified under the catchy label of 'gluttony' introduced by Coon & Keine (2020). In these cases, an otherwise fully grammatical morphological form turns out ineffable in a certain context due to the presence of additional features that it must but cannot express together with its other features. Case number restrictions in Russian are due to an additional gender feature and, thus, belong to this type.

I speculate that the analysis developed in this paper can be extended to all instances of ineffability that belong to this type. While I cannot consider all relevant case studies here, let me briefly outline how the analysis would capture one of the best-known cases: case matching in free relative clauses (see Groos & van Riemsdijk 1981). The pattern is in a nutshell as follows. Free relative clauses are ungrammatical if the case assigned to a relative pronoun does not match the case assigned to a missing head noun unless a morphological form of the relative pronoun can realize both cases simultaneously, i.e., is syncretic between them. Analyses of free relatives differ in whether there is a null nominal head under which the relative CP is embedded (see Groos & van Riemsdijk 1981, Gračanin-Yuksek 2008, and Himmelreich 2017) or the relative pronoun itself fills the position in the main clause (see Donati & Cecchetto 2011, Ott 2011). For the approach to morphological ineffability proposed in this paper to account for the matching requirement in free relatives, Vocabulary Insertion of a relative pronoun's inflection must target a terminal that is specified for a case assigned in the relative clause, while a case feature assigned in the main clause must lower into this node later, possibly altering its features after Vocabulary Insertion has applied. This ordering is predicted under any approach to free relatives: A relative pronoun gets case inside the relative CP first and has a complete feature structure for realization after this. The second case feature is assigned by structurally higher material in the main clause later in the derivation. This feature must then be incorporated into the node that realizes inflection of the relative pronoun (for instance, because it has no other host).

The second type of morphological ineffability comes from cases where a stem does not have a form that would realize features regularly realized on stems of this category. This type can be unified as inflectional defectivity and illustrated by paradigm gaps. Ineffability of this type

also often receives an analysis in terms of conflicting requirements that cannot be fulfilled by morphology. However, these conflicting requirements do not seem to be reducible to syntactic features (cf. Albright 2009, Pertsova 2016, and Müller 2020). In result, the account in this paper is not straightforwardly extendable to ineffability of this type.

Acknowledgements

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