Interactions of gender and number agreement: Evidence from Bosnian/Croatian/Serbian*

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Abstract
Split hybrid nouns in Bosnian/Croatian/Serbian display two sets of interesting properties: they can bear both natural and grammatical gender, and which gender participates in agreement depends on the number of the noun. While in the singular they invariably trigger natural (masculine) agreement, optionality between masculine and (grammatical) feminine obtains in the plural. Such nouns pose two theoretical challenges: (i) Agree must be able to operate on two kinds of gender and (ii) gender must be allowed to interact with number. Previous accounts propose complex mapping between semantic, syntactic and class features, but ultimately cannot derive the obligatoriness of natural agreement in the singular and optionality in the plural in a unified way. I provide a Minimalist analysis of hybrid nouns' agreement, combining the formal tools of feature hierarchies and relativized probing, which derive the obligatoriness of natural gender in the singular, and Cyclic Agree, with different orders of application of Agree operations, which derives the optionality as intervention effects.
Keywords: gender, number, feature geometry, relativized probing, order of operations, opacity

1 Introduction and Overview

The focus of this paper are gender and number agreement patterns on different agreement targets in Bosnian/Croatian/Serbian (henceforth: BCS). This language has a mixed-gender system, i.e. a system with both natural and grammatical gender. Certain agreement patterns notably reveal that both kinds of gender can be found on the same noun, as a given noun may trigger grammatical gender agreement in some contexts and natural gender agreement in others. Even more curiously, this distinction is systematically conditioned by the number marking on the noun. An illustration of the phenomenon in BCS comes from so-called *split hybrid nouns* (Corbett 2015),

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which bear natural masculine gender but are grammatically feminine. Unlike with other hybrid nouns, agreement alternations between grammatical and natural gender with split hybrid nouns occur only in the plural. In particular, while they consistently trigger masculine (natural gender) agreement in the singular, as shown by (1a-b), in the plural they can trigger either feminine (grammatical gender) agreement, as in (1c), or masculine, as illustrated in (1d).

(1) a. Star-**i** vladika me je juče posetio-∅.
old-MSG bishop me is yesterday visit.PRT-MSG
'The old bishop visited me yesterday.'

b. *Star-**a** vladika me je juče posetil-**a**.
old-FSG bishop me is yesterday visit.PRT-FSG
'The old bishop visited me yesterday.'

c. Star-**e** vladike su me juče posetil-**e**.
old-FPL bishop.PL are me yesterday visit.PRT-FPL
'The old bishops visited me yesterday.'

d. Star-**i** vladike su me juče posetil-**i**.
old-MPL bishop.PL are me yesterday visit.PRT-MPL
'The old bishops visited me yesterday.'

The agreement patterns of split hybrid nouns in (1) show two interesting properties. (i) Agreement can reflect either natural or grammatical gender on the noun, and (ii) the choice of natural vs. grammatical gender agreement is conditioned by differences in number marking. This has not gone unnoticed even in traditional grammars (Stevanović 1989; Stanojčić and Popović 1992), as well as in some recent work, for instance Corbett 2010, 2015. However formal literature so far (Corbett 2010; Wechsler and Zlatić 2000, 2003; Alsina and Arsenijević 2012*a*,*b*; Despić 2017) has not provided an explanation in terms of a concrete agreement mechanism that consistently derives the patterns. These patterns raise important empirical and theoretical questions such as what enforces the obligatoriness of natural gender agreement in the singular, while allowing for optionality only in the plural and what the agreement patterns of these nouns reveal about the structure of nominals and agreement mechanisms in general in BCS, and languages with similar mixed gender assignment systems. The goal of this paper is to tackle these issues by investigating the complex interplay of number and gender agreement in BCS in detail.

I will argue that the obligatoriness of natural gender agreement in the singular and optionality in the plural are a result of a single underlying syntactic mechanism of agreement, which essentially involves cyclicity and intervention effects caused by plural number. I propose that natural gender is present on a lower functional projection than the grammatical gender, with the plural number feature being projected in between them. This intervening position, I argue, is partly responsible for triggering the gender agreement optionality in the plural. Additionally, I utilize the feature geometry approach (Harley and Ritter 2002) to analyze natural gender as featurally more complex than grammatical gender. Such complex gender is then taken to be the preferred goal for the gender probe and this preference will be modeled under the relativized probing approach (Béjar and Řezáč 2009; Preminger 2014). Relativized probing for the more complex natural gender will eventually derive the obligatoriness of natural gender agreement in the singular. Finally, I take gender and number agreement to be two separate operations that can be carried out in different orders with respect to each other. The freedom of ordering of Agree operations will be crucial in accounting for optionality in the plural. It will ultimately be shown that the intervention effects by plural number are a result of opaque interactions in the mechanism of Agree.

The paper is structured as follows. Section 2 gives an overview of the empirical domain, focusing on declension class II, for reasons to become apparent shortly. Section 3 discusses previous

accounts, pointing out why they cannot capture all the agreement facts in BCS. Subsequently, Section 4 outlines the basic assumptions regarding the structure of the DP in BCS, structure of gender features, relativized probing and ordering of operations, which provide the basic ingredients for the analysis and concrete derivations for all the patterns provided afterwards in 4.3. The restrictions on the agreement patterns in DP-internal and predicate agreement which show Agreement Hierarchy effects are discussed in Section 5, while other possible extensions to other hybrid agreement phenomena are presented in section 6. Section 7 summarizes and concludes.

2 Data

BCS distinguishes between three genders – masculine, feminine and neuter. The language has a mixed gender assignment system (cf. Corbett 1991:34). Natural gender is the gender of animate nouns which corresponds to the gender of the referent. Grammatical gender is assigned according to purely formal (morpho-syntactic) criteria, which are related to a noun's membership to an inflection class (cf. Corbett 1991:34). BCS distinguishes between three nominal inflection classes (Mrazović and Vukadinović 1990). The correlation between inflection class and the type of gender on the noun is represented in Table 1. Nouns belonging to Class I are either neuter, carrying the suffix *-o* or *-e*, or masculine, ending in -∅, hence the sub-division into I_m and I_n. Class II hosts nouns ending in *-a*, which include both feminine and animate masculine nouns. Class III nouns end in -∅ and almost all of them are feminine inanimate.

Class	Example	Ending	Gender
I_m	*otac*-∅ 'father', *krov*-∅ 'roof'	-∅	masculine
I_n	*sel-o* 'village', *mor-e* 'sea'	*-o* or *-e*	neuter
II	*majk-a* 'mother', *kuć-a* 'house'	*-a*	feminine
	vladik-a 'bishop'		masculine
III	*ljubav*-∅ 'love'	-∅	feminine

Table 1: Declension class and gender

This section provides an overview of the different types of Class II nouns in BCS. Only Class II nouns will be under scrutiny in this paper, as subtypes of nouns belonging to this class show optionality between natural and grammatical gender agreement of the type presented in (1). What makes all these nouns similar, as we will see below, is that they all bear grammatical feminine gender, and what makes them different from one another is the natural gender they may have. It is this latter point and its ramifications that this section will be concerned with.

2.1 Class II (Split Hybrid) Nouns with Natural Masculine and Grammatical Feminine Gender

Split hybrid nouns such as *vladika* 'bishop', *vojvoda* 'duke', *gazda* 'landlord', *starešina* 'head, senior', *drvodelja* 'carpenter', *bekrija* 'tippler', *kolega* 'colleague', *komšija* 'neighbour', among others, will henceforth be referred to using the label 'nouns with natural masculine and grammatical feminine gender' (Stanojčić and Popović 1992:288,Stevanović 1989:130f.).[1] Since they denote hu-

[1]A reviewer points out that split hybrid nouns tend to be quite a loose class in BCS and even nouns such as *drvodelja* 'carpenter' or *starešina* 'head, senior' can be used by some speakers as feminine when referring to a female. In this case, I assume that these speakers treat them as gender variable nouns, cf. Section 2.3.

man animate male referents, such nouns bear natural masculine gender in BCS. But these nouns have a curious property, as noted above – they show additional gender variation along the number divide. This has the effect that in the singular, they always trigger masculine agreement (2a) – straightforwardly reflecting the natural gender on the noun – but in the plural, they can trigger either masculine or feminine agreement:

(2) a. Star-**i**/*star-**a** vladik-**a** me je juče posetio-∅/*posetil-**a**.
old-MSG/old-FSG bishop-MSG me is yesterday visit.PRT-MSG/visit.PRT-FSG
'The old bishop visited me yesterday.'

b. Star-**e** vladik-**e** su me juče posetil-**e**/posetil-**i**.
old-FPL bishop-MPL are me yesterday visit.PRT-FPL/visit.PRT-MPL
'The old bishops visited me yesterday.'

I take the feminine agreement in (2) to be a reflex of grammatical gender on the noun, since the nouns in question bear natural masculine gender. Thus, in the plural the noun's agreement varies between grammatical and natural gender (with grammatical gender being the preferred option). Note that there is a restriction on mismatches between attributive and verbal agreement. If the nominal modifier agrees in grammatical gender, the verb can show either natural or grammatical agreement, as in (2b). If the modifier shows natural gender agreement, the verb must agree with the same gender; returning to grammatical agreement is not possible:

(3) Star-**i** vladik-**e** su me juče posetil-**i**/*posetil-**e**.
old-MPL bishop-MPL are me yesterday visit.PRT-MPL/visit.PRT-FPL
'The old bishops visited me yesterday.'

This pattern is in accordance with *Agreement Hierarchy* recorded by Corbett (1979). Once semantic agreement obtains on a nominal modifier, it has to be maintained on the predicate.[2]
The interpretation of agreement markers on predicates and modifiers presents further evidence that the feminine gender on such nouns reflects a formal property, and has nothing to do with the natural gender. Consider the following example with a plural Class II masculine noun.

(4) Komšije su stigle.
neighbours.PL are arrive.PRT.FPL
'Neighbours arrived.'

The noun above can never refer to a group of female entities. Despite the feminine agreement, the noun can refer either to a group of masculine entities, or alternatively to a mixed group of referents. The feminine gender is thus strictly formal. If a speaker wishes to refer to a group of female entities, the necessary noun is derived from the same root but has a slightly different form and it may never trigger masculine agreement:

(5) Komšinice su stigle/*stigli.
neighbours.FPL are arrive.PRT.FPL/arrive.PRT.MPL
'(Female) neighbours arrived.'

[2] Corbett (1979:204) posits the following Agreement Hierarchy: (i) *attributive* > *predicate* > *relative pronoun* > *personal pronoun*. In essence, the further rightward we move along the hierarchy, the greater the chance of semantic agreement. Thus there is a greater chance for the verb to show semantic agreement (natural gender), than the adjective (which prefers grammatical gender). Moreover, if the adjective (attributive) shows grammatical gender agreement, the verb can still show either grammatical or semantic agreement. But if the adjective agrees with semantic gender, it is impossible to go back to grammatical agreement, and the verb needs to agree only with the semantic features (i.e. show natural gender agreement, hence the ungrammaticality of (3)). See Puškar (2017) for a more detailed formal account of Agreement Hierarchy effects with hybrid nouns.

If, however, a plural Class II masculine noun triggers masculine agreement, and it refers to an all-male group, such agreement reflects natural gender on the noun (just as in the singular):

(6) Komšije su stigli.
neighbours.PL are arrive.PRT.MPL
'Neighbours arrived.'

It is less clear, though, why masculine agreement should nevertheless be possible with a mixed group. This could mean that having at least some male referents is a necessary precondition for natural gender agreement. Masculine could also be default agreement in this case, as suggested by a reviewer, inserted as a feature-conflict resolution strategy, since it is impossible to find a unique gender value in a mixed group. However, the issue of agreement with a mixed group of referents, while fascinating, is beyond the scope of this paper and will be left aside for future research (for further discussion of such issues, see Arsenijević 2016; Despić 2017).

2.2 Class II Nouns with Natural Feminine and Grammatical Feminine Gender

Nouns with natural feminine gender include those such as *majka* 'mother', *sestra* 'sister', etc. They denote animate female referents, so their morphosyntactic gender transparently reflects the natural one. They always trigger feminine agreement, both in the singular and in the plural. Masculine agreement with these nouns is impossible.

(7) a. Pametn-**a**/*pametan-∅ devojčic-**a** je otišl-**a**/*otišao-∅ u šetnju.
smart-FSG/smart-MSG girl-FSG is go.PRT-FSG/go.PRT-MSG in walk
'A smart girl went for a walk.'
b. Pametn-**e**/*pametn-**i** devojčic-**e** su otišl-**e**/*otišl-**i** u šetnju.
smart-FPL/smart-MPL girl-FPL are go.PRT-FPL/go.PRT-MPL in walk
'Smart girls went for a walk.'

Even though these nouns are naturally feminine, they share the form of other grammatically feminine nouns in the language. It is thus unclear from the surface representation which of the two genders agreement actually reflects.

2.3 Class II Nouns with Variable Natural and Grammatical Feminine Gender

A subtype of Class II nouns may denote either a male or a female entity. Such nouns include *budala* 'fool', *varalica* 'cheater', *kolovođa* 'leader in traditional dances', *mušterija* 'customer', *propalica* 'loser, failure', *pijanica* 'drunkard', *skitnica* 'wanderer, drifter', *sluga* 'servant', *sudija* 'judge' (Stevanović 1989:130ff., Stanojčić and Popović 1992:288). Their natural gender is variable and can be inferred from the context. In general, if the gender of the noun is made known in the context, the agreement in the singular always reflects the natural gender. The example (8a) below thus refers to a female customer, while (8b) refers to a male one.[3]

[3] A reviewer notes that both examples are somewhat degraded in the given context and suggests that these patterns should ideally be experimentally tested. See Murphy et al., to appear for an experimental study of agreement patterns with these nouns under NP ellipsis, showing that a number of speakers do find masculine agreement with male referents no less acceptable than feminine in certain contexts.

(8) a. Star-**a** mušterija je dobil-**a** popust.
old-FSG customer is get.PRT-FSG discount
'The old (female) customer got a discount.'
b. Star-**i** mušterija je dobio-∅ popust.
old-MSG customer is get.PRT-MSG discount
'The old (male) customer got a discount.'

Yet, any noun from this group can show grammatical gender agreement even in the singular. This is reflected in consistent feminine agreement when it is irrelevant whether the noun refers to a male or female entity. As illustrated in (9), a noun from this group, such as *budala* 'fool', obligatorily triggers feminine agreement when it indicates a non-specific individual and the speaker does not want to refer to their sex, or it is simply unknown or irrelevant to the discussion. The noun can thus be interpreted as referring to either a female or a male individual, but the invariable feminine agreement triggered under the noun in this context suggests that the unmarked grammatical gender of these nouns is feminine.

(9) Neka budala je kucala na vrata.
some.FSG fool.FSG is knock.PRT.FSG on door
'Some fool was knocking at the door.'

As with nouns in Section 2.1, the same alternation between natural and (feminine) grammatical gender agreement is also evinced in the plural.

(10) Budale su malo popil-**e**/popil-**i**.
fools are a.little drink.PRT-FPL/drink.PRT-FPL
'Fools drank a little.'

If the noun above denotes a group of *female referents*, feminine agreement on the verb can be considered to be either agreement according to natural gender, or as formal agreement, according to the grammatical gender on the noun.[4] If the noun denotes a group of *male referents*, feminine agreement is clearly an instance of formal agreement. Masculine agreement can only be considered to be agreement according to natural gender. Finally, if the noun denotes a *mixed group* of referents, feminine signals formal agreement, whereas masculine can be either natural or default, but its exact nature, as before, will be left for future research.

2.4 Class II Nouns with Grammatical Feminine Gender (and no Natural Gender)

Nouns such as *stolica* 'chair', *kuhinja* 'kitchen', etc. denote inanimate objects, thus they have no natural gender. Nevertheless, agreement triggered under these nouns both in the singular and in the plural is feminine (11), which indicates that their gender is grammatical.

(11) a. Drven-**a**/*drven-**i** stolic-**a** je stajal-**a**/*stajao-∅ u kuhinji.
wooden-FSG/wooden-MSG chair-FSG is stand.PRT-FSG/stand.PRT-MSG in kitchen
'A wooden chair was standing in the kitchen.'

[4] In case the plural noun of this kind referring to an all-female group triggers masculine agreement, this is neither natural nor grammatical, but undoubtedly default agreement, as there is no masculine feature anywhere on the noun to refer to. Some of my informants reject masculine agreement with an all-female group, whereas some find it acceptable or degraded. This potentially indicates a difference between individual grammars, where some speakers allow default as an option whereas others do not (see Marušič et al. 2015:60 for a similar claim on default agreement in Slovenian). I leave this issue for further research, awaiting a more precise empirical picture.

b. Drven-**e**/*Drven-**i** stolic-**e** su stajal-**e**/*stajal-**i** u kuhinji.
wooden-FPL/wooden-MPL chair-FPL are stand.PRT-FPL/stand.PRT-MPL in kitchen
'Wooden chairs were standing in the kitchen.'

An additional group of nouns with grammatical feminine gender are *epicene nouns*, which have animate referents, but denote, for example, members of a particular species, either male or female (see Arsenijević and Gračanin-Yuksek 2016). Such nouns include e.g. *roda* 'stork', *žirafa* 'giraffe' etc., and nouns like *osoba* 'person', *beba* 'baby'. The evidence for the absence of natural gender on them comes from the agreement they trigger. They always consistently agree as feminine, even when the speaker wishes to indicate that the referent is male.

(12) a. Mušk-**a**/*mušk-**i** rod-**a** je letel-**a**/*lete-**o** iznad grada.
male-FSG/male-MSG stork-FSG is fly.PRT-FSG/fly.PRT-MSG above town
'A male stork was flying above the town.'
b. Muške-**e**/*Muške-**i** rod-**e** su letel-**e**/*letel-**i** iznad grada.
male-FPL/male-MPL stork-FPL are fly.PRT-FPL/fly.PRT-MPL above town
'Male storks were flying above the town.'

Based on their agreement properties, despite the animacy specification, in the analysis below these nouns will be taken to be marked as grammatically feminine.

2.5 Summary and Generalisations

Let us briefly summarize the types of nouns and their agreement patterns from Sections 2.1–2.4:

Example	*nat. gen*	GRAMM. GEN	Agreement	
			SG	PL
2.1 *vladika* 'bishop'	*masc*	FEM	*masc*	*masc* / FEM
2.2 *majka* 'mother'	*fem*	FEM	*fem*	*fem* / FEM
2.3 *budala* 'fool'	*masc or fem*	FEM	*masc* / *fem*	*masc*/*fem* or FEM
2.4 *stolica* 'chair'	*none*	FEM	FEM	FEM

Table 2: Summary of gender agreement patterns with Class II nouns

The patterns above lead to three descriptive generalisations about gender features on Class II nouns. First, patterns of variation between natural and grammatical gender agreement in 2.1–2.3 indicate that both natural and grammatical gender features can be present on a single noun. Second, based on the agreement they trigger, what unifies all these nouns is the fact that their grammatical gender is feminine. There is no restriction on their natural gender – it can be feminine, masculine, variable, or undesrpecified. Finally, agreement mechanisms in BCS seem to be able to operate on both kinds of gender. Thus, gender features on nouns must be sufficiently similar in structure for Agree to recognize them. The gender features also need to be sufficiently different for the Agree mechanisms to target natural gender in the singular and allow for alternations in the plural, meaning in turn that agreement for gender must also be sensitive to the number information on the noun.

3 Previous Accounts

Previous literature has dealt with nouns of dual gender in BCS mostly within the studies on agreement with hybrid nouns. For instance, Corbett (1991, 2010, 2015) discusses nouns of dual gender in BCS, offering descriptive patterns and insightful observations on their agreement properties. Yet, apart from identifying such nouns as "hybrids" in Corbett 2010:162f. and stating that they may control both natural and grammatical gender agreement, little is said about how these agreement properties could be formally explained.

Wechsler and Zlatić (2000, 2003) offer a formal HPSG account of the representation of features on nouns in BCS, together with agreement mechanisms. As a detailed evaluation of an HPSG analysis is beyond the scope of this paper, I abstract away from the technical considerations inherent to that framework, and focus only on the points relevant for current purposes. In their theory, every noun has two sets of features: *concord features*, which denote purely formal properties of the noun (case, number, gender) and *index features*, related to a noun's referential index and semantics, e.g. whether a noun denotes a male or female entity. A constructive insight of their analysis is that BCS has *feature-mapping constraints* that regulate formal gender assignment which determine a noun's *concord* (grammatical) *gender* on the basis of the declension class it belongs to. For instance, such mapping constraints will ensure that nouns of Class II are assigned feminine gender as their concord gender. Concord gender then maps to index gender and thus for most nouns those two values are the same. However, mismatches between these three types of features are possible, as illustrated by Wechsler and Zlatić (2000, 2003) for Class II male-referring nouns such as *komšija* 'neighbour'. This noun, even though it belongs to Class II and declines like a feminine noun, involves a declension-concord mismatch in the singular, as its declension class fails to map to concord gender (such mismatch is caused by the noun's semantics, which forces masculine index and concord gender assignment). In the plural however, such noun need not be gender-specific (they can refer to a mixed group, thus the referents need not be strictly male). Feminine concord gender is then assigned regularly according to declension class. Such nouns are thus feminine in the plural, unlike in the singular where semantic features impose masculine gender assignment.

Wechsler and Zlatić (2000:814) acknowledge that in some dialects, however, it is possible that a noun be assigned natural gender even in the plural, and can therefore optionally trigger either natural or grammatical gender agreement depending on the gender assigned to it. This account, even though intuitively appealing, only derives optionality in the plural as a dialectal difference, ignoring the fact that it is a viable option in all dialects. It is also unclear why rules of semantic assignment can override grammatical gender assignment only in some contexts, and operate consistently in others. The analysis is thus ultimately unable to derive the obligatoriness of natural gender agreement in the singular and the alternation between grammatical and natural gender agreement in the plural in a systematic way.[5]

Some recent accounts that deal with gender features in BCS through investigating different agreement phenomena include Bošković 2009; Willer-Gold et al. 2016; Arsenijević and Mitić 2016; Despić 2016 (conjunct agreement), Arsenijević and Gračanin-Yuksek 2016 (agreement in relative clauses), and Arsenijević 2016; Despić 2017 (interaction of gender and number and mixed agreement patterns). Bošković (2009, 2011) argues that grammatical gender in BCS should be treated as a valued uninterpretable feature on a noun (following Pesetsky and Torrego 2007). Natural gender, on the other hand, is an interpretable feature. Under such an approach, it would

[5] See Landau 2016 for a recent account on agreement with hybrid nouns based on Wechsler and Zlatić 2003. See also Alsina and Arsenijević 2012*a*,*b* for a detailed discussion on different types of features proposed in Wechsler and Zlatić 2000, 2003, as well as for an LFG account of agreement with hybrid nouns in BCS.

have to be assumed that a noun such as the masculine Class II noun (one with natural masculine and grammatical feminine gender) has both an interpretable masculine and an uninterpretable feminine feature on the lexical entry and that the uninterpretable feature can be targeted only when the noun has plural number. Alternatively, it might be assumed that the uninterpretable feminine feature appears only in the context of plural number. What we would need in such an account is then either an assumption that uninterpretable feature assignment depends on number, or that the Agree mechanism always needs to target interpretable features in the singular while in the plural it can target both. Since this account focuses only on regular nouns and their behaviour in conjunctions, it has no way of explaining the assignment and location of two different gender features on a noun, or agreement patterns with them (but see Despić 2016 for an interesting proposal that tackles exactly these issues).[6]

Despić (2016; 2017) deals with agreement patterns with hybrid nouns in terms of feature markedness and impoverishment. In these accounts, natural gender is assigned according to the meaning that the root carries, while declension class is a diacritic on the noun's root. Grammatical gender is assigned according to declension class, via declension-gender mapping rules, and this feature is visible on the noun's suffix. Additionally, redundancy rules provide declension class diacritics for nouns that are only assigned natural gender, but do not have grammatical gender. The purpose of these redundancy rules, however, is somewhat unclear, since if we assume that declension class is the formal property of the noun that each noun's root should intrinsically have, we should not expect declension class to be specified in alternative ways.

Much of Despić's (2016; 2017) account is based on relative markedness of ϕ-features. Grammatical gender is assumed to be the less marked of the two genders, as it is easily retrievable from the noun's suffix, unlike the natural gender, which requires more complex semantic mapping mechanisms. Plural number and non-nominative case are also taken to be marked features. If marked features appear together on a lexical item, they cause markedness accumulation, which is remedied post-syntactically, by deleting the conflicting features via Impoverishment rules. Since gender is the least marked feature with respect to number and case (cf. Harley and Ritter 2002), it is the feature most prone to deletion under Impoverishment. Despić further argues that adjectives in Serbian obey strict markedness constraints and if they are valued with conflicting gender features, the marked gender is deleted via Impoverishment. With Class II masculine split-hybrid nouns, feminine agreement is preferred on the adjective in the plural since, under the assumption that plural adjective contains features [PL,F_{gramm},M_{nat},Nom], this combination of plural number and two gender features induces a markedness accumulation. Natural gender (as a more marked gender feature) is then deleted via an Impoverishment rule.

Languages (and even speakers) can differ in what markedness constraints apply in their grammars (i.e. which feature combinations they consider to be marked). According to this account, the source of variation in different languages/dialects/speakers lies in the presence of such constraints and and Impoverishment rules that mitigate against them. As Croatian, for instance, more readily allows masculine plural agreement, it might tolerate greater number of marked features than Serbian. Apart from that, little is said about what allows for more variation in predicate agreement with these nouns. (Predicate agreement is tackled in more detail with other types of hybrid nouns, but the focus is on secondary predicates, not verbs.) A possible solution could be that markedness constraints are less restrictive with predicates. Since Despić's account focuses more on deriving agreement patterns with other hybrid nouns in Serbian (*braća* 'brothers', *deca* 'children', etc., and agreement with honorific pronouns), all of which involve both conflicting

[6] For a proposal on the location of two different gender features on DP in BCS see Arsenijević and Gračanin-Yuksek 2016. This account however would require further extensions in order to explain how Agree could target one of them in singular and either of them optionally in the plural.

gender and number features, and the emphasis is more on nominal concord, the issues of predicate agreement and Agreement Hierarchy would need further elaboration in order to enable their critical assessment.
Previous approaches to hybrid agreement in BCS thus only address subsets of the general problem that this paper is concerned with: the nature of gender features, their position in the structure, or issues in agreement. I provide an account that tackles all these points, as well as the obligatoriness of natural gender agreement in the singular and optionality in the plural, and the Agreement Hierarchy, in a unified manner.

4 Analysis

In the sections that follow, I first introduce the theoretical tools for the analysis. Recall that the main empirical puzzle involves three complementary issues: (i) How is a noun able to bear only grammatical gender in some cases and both genders in others? (ii) How is the verb able to distinguish between the two types of gender and target them differently according to the number environment? (iii) How should the systematic connection between gender and number agreement be derived such that natural gender is always targeted in the singular, while allowing alternations to appear only in the plural? I will offer a proposal on how to capture the assumption that two kinds of gender features can be present simultaneously on a noun. Subsequently, I develop a theory of Agree that can distinguish between the two types of gender features, systematically operating on them in a different way. Finally, I show how plural number, located between the two gender features, triggers intervention effects for Agree.

4.1 The Structure of DP in BCS

4.1.1 Gender on nouns

In this section I propose a structural representation of the nominal phrase in BCS, starting with the loci of gender features.[7] Multiple gender features have already been proposed in the literature, but their representation is either modelled in a different framework (HPSG by Wechsler and Zlatić 2003), or based on feature interpretability (e.g. Smith 2015; Wurmbrand 2017), or assuming a configuration that cannot derive the BCS patterns (Pesetsky 2013; Landau 2016).[8] The necessity of distinguishing grammatical from natural gender syntactically and semantically has been supported in recent experimental work by Murphy et al. (to appear) on gender variable nouns (cf. *budala* 'fool' from Section 2.3). On the syntactic side, the two types of gender are treated differently by processes such as ellipsis, indicating that there should be a difference in their syntactic representation. Semantically, natural gender has an additional meaning component, i.e. it introduces a presupposition that the referent has a particular gender. In the analysis below, I will focus mostly on their (morpho)syntactic properties.[9]

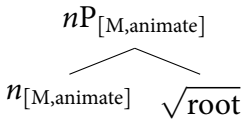
[7] I follow Progovac (1998); Caruso (2012); Stanković (2014) in treating the BCS nominal phrase as a DP (contra Bošković 2008). The analysis could potentially be transposed into a system without the DP layer under the assumption that each nominal modifier is a probe and individually carries out the Agree operations.

[8] I will postpone a more detailed evaluation of such proposals until Section 6.

[9] The results of the experiments reported by Murphy et al. (to appear) are thus suggestive of a necessity for separating grammatical and natural gender in the grammar. However, the results are inconclusive about the exact position of the gender features with respect to each other in the DP structure. As suggested in the paper, both constellations should be equally able to explain the agreement mismatches under NP ellipsis. However, the experiments have only tested the behaviour of gender variable nouns, and more data is necessary to establish whether there is a substantial difference between them and the split hybrid nouns addressed in this paper. Anticipating further experimental

Adopting the framework of Distributed Morphology (Halle and Marantz 1993; Harley and Noyer 1999) and the view that syntactic computation operates on abstract bundles of morphosyntactic features, I further follow Kihm 2005; Lowenstamm 2008; Acquaviva 2009; Kramer 2015 in treating gender as a morphosyntactic feature located on the functional head *n*, which merges with a category-free root (in the sense of Embick and Halle 2005; Acquaviva 2009; Harley 2014). Additionally, I utilize the functional projection Gen(der)P (Bernstein 1993; Picallo 2008), located above the *n*P, as another possible locus of gender features. A novel component of the present approach is the idea that in BCS both projections are necessarily present on DP.
Following Kramer 2015, the nominalizer combines with a root to derive a noun and if it bears a masculine gender feature, the resulting noun will bear natural masculine gender too.

(13) Nominalizer *n* + a category-free root (Halle and Marantz 1993; Harley and Noyer 1999)



I propose that BCS has three different nominalizers that build nouns in this language. The first nominalizer, n_m has a feature [M(asculine), animate] (henceforth [M,anim]), the second, n_f, has a gender feature [F,anim], and the third, $n_\varnothing$, has no gender features.[10] A noun created by a nominalizer that carries both gender and animacy features will thus have natural gender (see Section 4.2 below for a more elaborate implementation of this assumption under the Harley and Ritter 2002 feature geometry approach to ϕ-feature structure). Example (14) illustrates how these nominalizers build the types of nouns discussed in Section 2.

(14)
a. n_m + $\sqrt{\text{vladik-}}$ 'bishop'... → natural masculine (cf. Section 2.1)
b. n_f + $\sqrt{\text{majk-}}$ 'mother'... → natural feminine (cf. Section 2.2)
c. $n_\varnothing$ + $\sqrt{\text{stolic-}}$ 'chair'... → grammatical feminine (cf. Section 2.4)

Roots for gender variable nouns, which can carry different natural gender based on the gender of the referent, such as $\sqrt{\text{budal-}}$ 'fool', can be optionally licensed under n_m, n_f or $n_\varnothing$. Depending on the nominalizer the roots merge with, the nouns derived will have natural masculine, natural feminine or grammatical feminine gender, where the final nominalizer derives nouns with only grammatical feminine, such as the one in example (9). This approach has the advantage of explaining how a particular root can yield nouns with different features and avoids instead postulating multiple homonymous occurrences of the same noun in the lexicon.
I follow Acquaviva (2009, 2014) and Kramer (2009, 2015) who propose that each nominalizer can merge only with certain roots and the possible combinations of nominalizers and corresponding roots are regulated by licensing conditions. Kramer (2015:50f.) proposes that semantic licensing conditions "are encoded in the Encyclopedia as conditions on the semantic interpretation of a root in a context" (Kramer 2015:51). On this view, roots freely combine with different nominalizers in syntax and the combinations are licensed at LF. On the morphological side, these features trigger the insertion of an appropriate exponent (Kramer 2015:52), thus any 'wrong' combinations will not be licensed by PF. In her view, this allows us to maintain one of the core DM assumptions,

testing of the different types of hybrid nouns, in this section and in the rest of the paper, I will argue that having the natural gender located below the grammatical has a greater explanatory power. See also Puškar 2017, for arguments from a wider, crosslinguistic range of hybrid agreement phenomena.

[10] Having three different nominalizers also corresponds to saying that there is only one *n* categorizing head that generally builds nouns, but it can be specified with three different kinds of features.

that roots contain no formal features.[11]

As for grammatical gender, I assume that it is introduced by the functional head Gen (Bernstein 1993; Picallo 2008), which merges above the *n*P and can bear any of the three grammatical gender features in BCS: [M], [F] or [N]. As was the case with the *n*P, I assume that GenP with different values can combine with any *n*+root combinations, but the illicit combinations will be rejected by the LF and PF interfaces (due to the impossibility to interpret or pronounce them). This has the benefit of allowing us to treat all nouns of Class II as a natural class – what they all have in common is an [F] feature on their GenP. Since the focus of this paper is on deriving the agreement patterns of split hybrid nouns, I refer the reader to Puškar 2017 for a more detailed discussion about the relatedness of inflection class and gender features.[12]

[11] A reviewer points out that even though roots do not have any formal features, since they relate to concepts, they should have certain semantic features, which is particularly apparent in nouns like 'woman', 'mother', etc., so it should not be the case that all gender features come only after the root is merged with *n*. I follow Kramer (2015:52) in assuming that roots are not inherently male or female, but that interpretation of a root in a particular context is what makes them be interpreted as male or female. One could also pursue an alternative approach, in which licensing of the combinations of roots and nominalizers could apply in narrow syntax. The semantic features of the root could in that case be checked against the formal features of *n* upon Merge (Alexiadou 2004; Matushansky 2013). Alternatively, as in a recent approach by Fathi and Lowenstamm (2016), we could posit a variety of an Agree operation carried out by *n*, which would value the natural gender feature of *n* with a particular value from the root phrase, if such a value exists on the root. Finally, we could simply assume that natural gender is a property of the root, not *n* (Kramer 2009; Steriopolo and Wiltschko 2010). In the present approach, what is important is that natural gender is a feature that is lower in the structure than grammatical gender, and determined or assigned first, before grammatical gender (cf. Corbett 1991; Wechsler and Zlatić 2003; Despić 2016.)

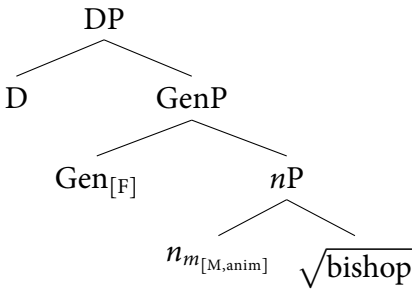
[12] While gender is a syntactic category, participating in agreement processes, declension class is a purely morphological property of a lexeme (see Harris 1991; Aronoff 1994; Wechsler and Zlatić 2003; Alexiadou 2004; Embick and Halle 2005; Alexiadou and Müller 2008 and Kramer 2015:233ff. for an overview). As for Slavic, some authors claim that gender is assigned according to declension class (Corbett 1991:34, Wechsler and Zlatić 2003). However, knowing the declension class of a noun in BCS does not necessary imply knowing its gender, as Class I can host masculine and neuter nouns, and Class II masculine and feminine (c.f. Table 1). Others argue that declension class is predictable from gender specification of the noun (cf. Crockett 1976:12 for Russian), but then masculine nouns can belong either to Class I_m or Class II, while feminine nouns can be found either in Class II or in Class III. Additionally, some authors postulate rules that apply in both directions (see Despić 2017) for BCS. Finally, Halle and Matushansky (2006); Bailyn and Nevins (2008) derive class as a combination of a root and a theme vowel (and agreement suffixes) in Russian. The approach developed here offers support for this final line of thinking. If we combine animacy (i.e. natural gender), grammatical gender and the noun's suffix – we get much closer to predicting what class a certain noun should belong to. If we think of the "natural gender" below as the gender introduced to the noun on *n*, grammatical gender as the one present at Gen and the "ending" as a suffix added to the noun in the nominative singular, the combination of the three will be able to tell us the declension class of the noun. (The nominative singular ending is known in Slavic literature as "theme suffix". See Halle and Matushansky 2006 for more detail on the nature of the theme suffix and its possible formalization under DM.)

NAT. GENDER	GRAMM. GENDER	ENDING	DECLENSION CLASS
	neuter	*-o* or *-e*	Class I_n
masculine animate	masculine	*-∅*	Class I_m
none	masculine	*-∅*	Class I_m
feminine animate	feminine	*-a*	Class II
none	feminine	*-a*	Class II
masculine animate	feminine	*-a*	Class II
none	feminine	*-∅*	Class III

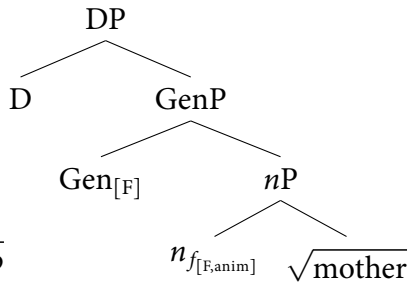
Under this approach, in BCS *-e*/*-o*, *-a* and *-∅* can be used as predictors for declension class (I_n, II and I_n/III, respectively). In the cases where it is ambiguous which declension to classify a noun into, we could assume that gender features are also consulted. Thus a noun ending in *-o* or *-e* will be placed into Class I_n, a noun ending in *-a* will decline in Class II, but a noun ending in *-∅* will decline as Class I_m if its grammatical gender is masculine and as Class III if its grammatical gender is feminine. This is where the interrelatedness of gender and class plays a crucial role. Thus a masculine noun as *vladika* 'bishop', consisting of a root $\sqrt{\text{vladik-}}$, a natural masculine nominalizer n_{m}

The consequence of the current proposal is that there are two potential structural positions for gender features on BCS nouns, the lower *n*P hosting natural gender and the higher GenP hosting grammatical gender, the latter of which, in the case of the nouns in our focus, is specified as feminine. Each group of BCS nouns discussed so far can be presented as in (15)–(17):

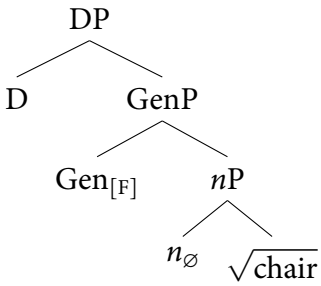
(15) Natural masculine (cf. Sec. 2.1)



(16) Natural feminine (cf. Sec. 2.2)



(17) Grammatical feminine (cf. Sec. 2.4)



Nouns with natural masculine gender (such as *vladika* 'bishop') are derived with the nominalizer n_m. These nouns then have the [M,anim] specification on *n*P, signaling a natural gender feature. The [F] feature is provided on GenP, yielding the structure in (15). Nouns with natural feminine gender (such as *majka* 'mother') are derived from the nominalizer n_f. The grammatical gender feature [F] is provided on the GenP, as in (16). Nouns with grammatical feminine gender (such as *stolica* 'chair') are derived with the nominalizer $n_\varnothing$, as in (17). These nouns do not have gender specified on the *n*P.[13] Such nouns then only have grammatical gender [F] on GenP. The system developed above allows us to straightforwardly capture gender assignment to gender variable nouns. Nouns like *budala* 'fool' (cf. Section 2.3) can be structured as either (15), (16), or (17) above, depending on the nominalizer the root is merged with, respectively yielding nouns with natural masculine or natural feminine gender, depending on the referent, or nouns with only grammatical feminine gender, in the cases where gender of the referent is truly unknown or irrelevant (cf. (9)).

4.1.2 Number on nouns

I assume that number on nouns in BCS is specified on the DP within the projection I will label as NumP (Picallo 1991; Bernstein 1993; Borer 2005; Acquaviva 2009; Harbour 2008). In the analysis below, NumP will be assumed to be projected only in case it specifies plural number, i.e. NumP is not projected if the noun is singular (Kratzer 2007). Singular number is therefore treated as

and Gen$_f$, receiving a theme suffix *-a* would be analysed into Class II. A benefit of this approach is that it would be able to predict inflection class with high degree of precision, making the connection between gender and class more formal. In sum, the nominal structure proposed in this paper, apart from being able to capture syntactic agreement patterns, has the potential to explain facts about nominal morphology as well.

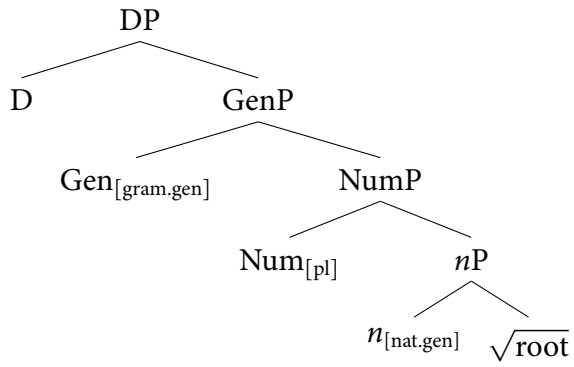
[13] We could, theoretically, also take into account the fact that some nouns with grammatical feminine gender also have animacy features (as noted in (12) for nouns like *roda* 'stork', denoting, for instance, animal species). In that case, an additional nominalizer $n_{a\varnothing[\text{anim}]}$ could be postulated. Nouns derived by this nominalizer would have animacy feature on *n*P and grammatical feminine gender supplied at GenP, yielding the following structure:

(i) $[_{\text{DP}}\ \text{D}\ [_{\text{GenP}}\ \text{Gen}_{[\text{F}]}\ [_{n\text{P}}\ n_{a\varnothing_{[\text{anim}]}}\ \sqrt{\text{stork}}\ ]]]$

Since in the analysis below these nouns behave exactly the same as nouns with only grammatical gender on the GenP, I abstract away from this possibility and treat these nouns as having only grammatical gender.

the absence of number, i.e. singular number is supplied by default (see Nevins 2011; Pesetsky 2013; Ackema and Neeleman 2015 for a similar claim on singular number in general, and Despić 2017 for a claim that singular number is unmarked with respect to plural in Serbian). I further propose that NumP is projected above the *n*P. The fact that gender and number are realized on a single fused morpheme is captured by having number-marking be linearly adjacent to gender marking on the noun. However, the precise position of the Num head relative to the two types of gender bearing heads is unclear from the surface.[14] I propose that NumP, when present, is projected between *n*P and GenP, as shown in (18). This will play a crucial role in capturing the influence of nominal number marking on gender agreement.

(18) Structure of DP in BCS



This structure in (18) captures the intuition that number and natural gender denote concepts that are in some sense closer to the concept introduced by the root, and this is modelled by having natural gender directly select for the root (cf. Kramer 2015). Grammatical gender, provided higher in the structure, is a purely formal feature, shaping the noun's morphological realisation.

4.2 Feature Hierarchies, Relativized Probing and the Mechanics of Agree

4.2.1 Feature geometric approach to ϕ-features

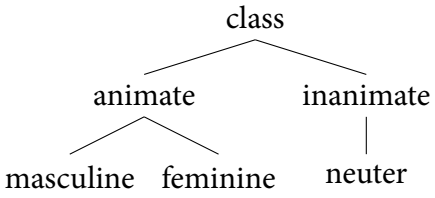
I adopt the *feature geometry* approach to ϕ-features, proposed originally by Harley and Ritter (2002) (see also McGinnis 2005; Nevins 2007; Béjar and Řezáč 2009; Georgi 2012, 2013; Preminger 2014 for various adaptations). The underlying idea is that person, number and gender features are in a hierarchical entailment relationship with respect to one another, but that their internal structure can also be relatively articulated. The increase in a feature's complexity leads to an increase in its markedness.

Harley and Ritter (2002) propose that class and gender belong to the same part of the hierarchy, with the category "class" further branching as illustrated in (19):[15]

[14] Inflectional morphology unfortunately does not help distinguish the order of the functional heads in the syntax via the *Mirror Principle*, since gender, number and case are always realized as a single inflectional morpheme, as in other Slavic languages.

[15] "Class" in this hierarchy is, arguably, not the same feature as declension class, as this is a morphological feature relevant in nominal paradigms, but not syntactic agreement. Class feature here should most probably be viewed as *agreement class* in the sense of Corbett 1991:147, a morphosyntactic feature akin to gender.

(19) Harley and Ritter 2002 hierarchy of class and gender



The gender and class feature hierarchy is not discussed in great detail by Harley and Ritter (2002:514), who admit that the internal structure and organisation of this part of the hierarchy would have to vary across languages, due to the great variation languages display in gender and class features in general. I adopt Harley and Ritter's general intuition that gender features include animacy specification in their structure, but I propose an adaptation of the hierarchy to capture gender in BCS (and possibly languages with the same mixed gender system).

Firstly, I assume the category "class" actually stands for "gender" in BCS. Here I follow Corbett 1991:147f. in equating gender with *agreement class*, which is a set of nouns that have the same feature structure and distribution and trigger the same kind of agreement on their targets. Based on these criteria, nouns in BCS can be classified in three groups, that coincide with the three traditional genders: masculine, feminine and neuter. This language thus does not need to make a special difference between agreement class and gender.

Furthermore, based on syncretisms in masculine inflectional paradigms and certain agreement facts, Corbett (1991:161) identifies two *subgenders* for BCS within the category of masculine gender: animate and inanimate. Animate masculine nouns show genitive-accusative syncretism, while inanimate nouns show nominative-accusative syncretism, and this is reflected both on the nouns and on the nominal modifiers and in agreement with them. With verbs, however, both animate and inanimate masculine nouns uniformly trigger masculine agreement.[16] This lead Corbett (1991:164) to postulate that animate and inanimate are subgenders of masculine in BCS, but not proper genders, as their behavior is different only in certain, but not all, contexts.

The subgenders are therefore dependent on the masculine gender, so it is not the case that being animate entails being masculine in BCS, but vice versa, if a noun is masculine, it can be either animate or inanimate. According to Corbett (1991:164) "this relationship represents an inversion of the semantic hierarchy in which male and female are subdivisions of animate." I therefore propose inverting the Harley and Ritter 2002 gender hierarchy such that all nominals in BCS

[16] Animate Class I masculine nouns display accusative-genitive syncretism (suffix *-a* on the example *drug* 'friend' below), while inanimate nouns show accusative-nominative syncretism (suffix -∅ on the noun *računar* 'computer'); the form of nominal modifiers also changes depending on the animacy of the noun (cf. *ovaj* 'this' in (i)). To illustrate, even though both nouns in (i) are masculine and in accusative, their inflectional suffixes and the forms of the modifiers differ, as in (ii).

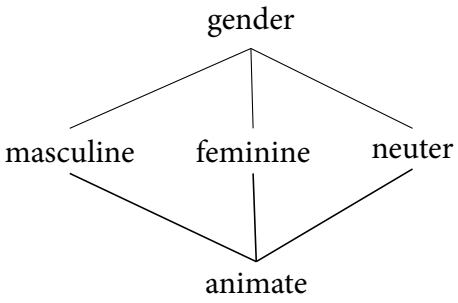
	animate	inanimate
Nom	ovaj drug-∅	**ovaj** računar-∅
Acc	**ovog** drug-**a**	**ovaj** računar-∅
Gen	**ovog** drug-**a**	ovog računar-a
Ins	ovim drug-om	ovim računar-om

(i) a. Video sam **tvog** **novog** drug-**a**.
seen.MSG am your.ACC.MSG new.ACC.MSG friend.ACC.MSG
'I've seen your new friend.' masculine animate

b. Video sam **tvoj** **novi** računar-∅.
seen.MSG am your.ACC.MSG new.ACC.MSG computer.ACC.MSG
'I've seen your new friend.' masculine inanimate

contain the gender node, but those that have natural gender also contain the additional "animate" node below it. The advantage of this way of modeling gender hierarchy is that differences between natural and grammatical gender fall out of their internal feature structures. In particular, natural gender is more complex than grammatical gender, since it contains an animacy node in addition to a gender node. In the modified version of the Harley and Ritter 2002 hierarchy, I replace *class* with *gender*. Gender can take three values – *masculine*, *feminine* and *neuter*. All three gender features can be associated to an additional *animate* node. This series of adaptations yields the following modified geometry:

(20) Modified hierarchy for gender[17]



The structure in (20) shows that what I have so far been calling "natural gender" is in fact just a featural composite, consisting of gender and animacy features (Corbett's "animate subgender"). "Grammatical gender", on the other hand, is less marked in the geometry and consists of the gender feature alone (Corbett's "inanimate subgender"). The advantage of this approach is that it straightforwardly captures the relatedness between natural and grammatical gender – they are both a type of gender. At the same time, it is also able to derive the differences between them by treating the natural gender as containing an additional animacy feature, yielding, within the feature geometry model, a hierarchical entailment relationship between the two, as in (20). Schematically, the two types of gender (ignoring neuter) will be represented as follows:

(21) Natural gender: $\begin{bmatrix} \text{M} \\ \text{anim} \end{bmatrix}$

(22) Natural gender: $\begin{bmatrix} \text{F} \\ \text{anim} \end{bmatrix}$

(23) Grammatical gender: [F] [M]

Having formalized the distinction of two kinds of gender, let us now turn to formalizing the preference of the gender probe towards the more complex, natural gender features.

4.2.2 Relativized probing

Relativized probing is the approach put forward in the work of Béjar (2003); Béjar and Řezáč (2009) and extended in Nevins 2007, 2011; Georgi 2012, 2013; Preminger 2014; Deal 2015, among others, to model agreement phenomena where the probe in the Agree relation has a preference for certain types of features. I adopt this approach to account for the preference of the gender probe in BCS to target natural gender on nouns.

[17] We might also assume that the association lines between [feminine] and [neuter] and [animate] do not exist in BCS, since the animacy difference is not reflected in the grammar for these genders, as opposed to [masculine]. However, in languages such as Russian, both [feminine] and [neuter] would have to have an [animate] node below them with animate nouns, as also suggested by Corbett (1991:167), since animacy is reflected in paradigms and agreement with all three genders.

The core idea is that Agree (as defined in Chomsky 2000, 2001) is the operation which makes sure that the unvalued features of the probe are valued by **matching** features on the **closest** c-commanding goal in a local relationship. Following Béjar (2003); Béjar and Řezáč (2009); Preminger (2014) in assuming that features can be represented with varying degrees of complexity both on the probe and on the goal, it is predicted that the probe will look for features of corresponding complexity on the goal and that those features need to be equally specified. Béjar (2003) assumes that the goal needs to have at least the same feature structure as the probe, i.e. the goal needs to entail the feature specification of the probe. If the goal does not have all the features the probe needs, Agree does not result in valuation, which triggers a second cycle of Agree. In the second cycle the probe's features are assumed to be reduced, after which it can be valued by a goal with a different level of featural complexity.
Relativized probing has consequences for locality and Minimality (Béjar 2003; Béjar and Řezáč 2009; Nevins 2007, 2011; Georgi 2012, 2013; Preminger 2014). If the probe is specified for a certain type of ϕ-feature, it is able to skip all XPs that do not bear the corresponding features and continue its search until it finds the features of the right type and complexity. Preminger (2014:62) illustrates this point based on relativized probing for plural number. If two DPs are available in a probe's search space, where the higher one is singular and the lower one is plural, the probe can skip the higher DP and not agree with it, continuing to look further down until it targets the lower plural DP. In other words, a DP counts as a potential goal for a probe only if it bears the right kind of feature specification for the Agree relation. If it does not, it cannot value the features on the probe, nor can it serve as an intervener between the probe and the eventual goal, by which defective intervention is disallowed in the system. As pointed out in Béjar 2003 and Preminger 2014, this is reminiscent of the Relativized Minimality idea of intervention developed in Rizzi 1990.

4.2.3 Relativized probing in gender agreement

Bearing in mind the general properties of relativized probing and the gender feature structure proposed in (21)–(23), assume now that the gender probe can also vary in complexity, which means that it can seek to be valued by (or be relativized with respect to) features of different complexity, for instance only natural, only grammatical, or either gender. This assumption would have a cross-linguistic consequence in that the locus of parametric variation between languages can lie in the complexity of the probe, which would be relativized towards different gender features in different languages. Assume further that in BCS gender probe is always relativized towards natural gender, which can schematically be illustrated as follows (I will use the notation [∗F:□∗] introduced in Heck and Müller 2007 to denote an unvalued probe feature):

(24) $\begin{bmatrix} *\text{gen:}\square* \\ *\text{anim:}\square* \end{bmatrix}$

Recall that nouns of Class II in BCS can have natural masculine, natural feminine, variable natural gender, or only grammatical gender. Let us take agreement with nouns with natural masculine gender as an example. Assuming the structure in (15), repeated here in (25), their *n*P has the features [M[anim]], whereas the GenP has only [F].

(25) $[_{\text{DP}}\ \text{D}\ [_{\text{GenP}}\ \text{Gen}_{[\text{F}]}\ [_{n\text{P}}\ n_{m[\text{M[anim]}]}\ \sqrt{\text{bishop}}\ ]]]$

I assume that matching followed by valuation of unvalued features is a necessary condition for successful Agree. Since the probe is specified as [∗gen:□[anim:□]∗] (the bracketed notation is a shorthand for the hierarchically structured probe in (24)), and the *n*P has values for both

features, Agree results in valuation of both the probe's features by *n*P rather than by GenP, as in (26)-(27). During the first cycle of Agree, the probe is able to search past GenP, which is the closer potential goal with gender features, because GenP does not have all the features of the probe. When targeting the *n*P, the goal and the probe match in all the features, which is a necessary precondition for valuation on the first cycle (see Preminger 2014:62 for the same proposal on probing for plural number). Valuation is carried out successfully at this point, so there is no need for the second cycle of Agree.

(26) Agree with GenP (no valuation):

PROBE	GOAL: GenP	AGREE
gen:□	[F]	✗
anim:□		

(27) Successful Agree for natural gender:

PROBE	GOAL: *n*P	AGREE
gen:□	[M]	✓
anim:□	[anim]	✓

If the probe does not find natural gender on *n*P (e.g. with nouns with only grammatical feminine gender), a new cycle of Agree is initiated. The probe's features are reduced up to the root node [*gen:□*] (see Béjar 2003:82), leading the probe to look only for gender, disregarding animacy. As a consequence, GenP, as the closest goal with the corresponding feature, can value the probe's features on the second cycle, resulting in grammatical gender agreement:

(28) Agree with *n*P (no valuation):

PROBE	GOAL: *n*P	AGREE
gen:□	∅	✗
anim:□		✗

(29) Successful Agree with GenP:

PROBE	GOAL: GenP	AGREE
gen:□	[F]	✓

Note that I follow Béjar 2003:67 in assuming that the goal essentially needs to entail all the probe's features, i.e. it needs to be equally complex as the probe in order for valuation to succeed. If the goal is less specified than the probe, valuation will inevitably fail. This is what triggers the reduction of the probe's features and another cycle of Agree. This excludes the situation in which the [*gen:□*] feature of the probe is valued by GenP, whereas [*anim:□*] is valued by *n*P. Valuation consists in copying the entire feature hierarchy fragment (or "snippet", cf. Preminger 2014:47) from the goal onto the probe, where the goal needs to value all the probe's features at once, excluding thereby the possibility of partial valuation.

4.2.4 Modeling number intervention – separate probing and order of operations

I assume that probing for number and gender features is performed separately by means of two independent Agree operations (henceforth: Number Agree and Gender Agree) (see Picallo 1991; Laka 1993; Ritter 1993; Antón-Méndez, Nicol and Garrett 2002; Béjar 2003; Carstens 2003; Řezáč 2004; Carminati 2005; Marušič et al. 2015; Preminger 2014 for various applications of this proposal and Bošković 2009 and Arsenijević and Mitić 2016 for BCS in particular). I follow Béjar and Řezáč 2009 in locating both probes for number and gender on the same head. I assume that the order of application of Agree operations is underspecified (Müller 2009; Georgi 2014; Assmann et al. 2015). This essentially yields two orders for a given probe: one where probing for number is ordered prior to probing for gender and the other where gender probing is ordered before number probing.[18] Thus in (30), gender agreement is carried out before number agreement

[18] I assume that D, adjectival and verbal probes may all carry these features. In BCS, both the participle and the auxiliary show agreement in number, whereas only the former shows gender agreement. I assume that the

as the gender probe is discharged first, whereas in (31) the order is reversed.

(30) Gender Agree ≻ Number Agree

$$\left[\begin{bmatrix} *\text{gen} : \square * \\ *\text{anim} : \square * \end{bmatrix} \begin{bmatrix} *\# : \square * \end{bmatrix}\right]$$

(31) Number Agree ≻ Gender Agree

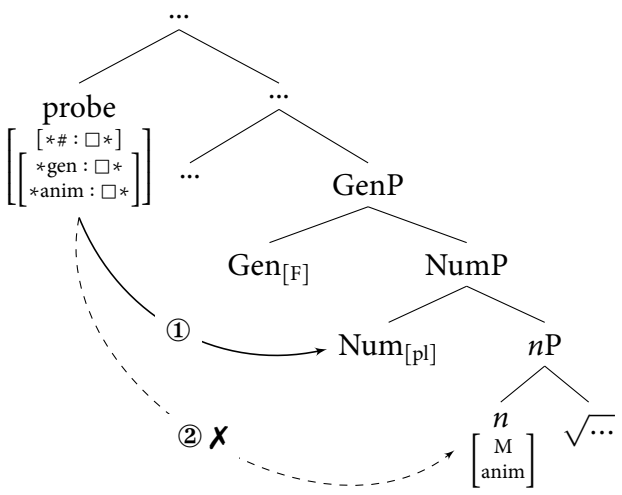
$$\left[\begin{bmatrix} *\# : \square * \end{bmatrix} \begin{bmatrix} *\text{gen} : \square * \\ *\text{anim} : \square * \end{bmatrix}\right]$$

An additional assumption I make is that after an Agree operation has been carried out, all syntactic objects c-commanded by the element bearing the goal feature become inaccessible for further Agree operations. Specifically, I propose the following condition on Agree:

(32) *Condition on Agree Domains (CAD)*
After an Agree operation X, triggered by a probe P from a syntactic head H, has targeted a goal G, any subsequent Agree operation Y, triggered by a probe Q on H cannot target any constituents c-commanded by G.

Consider an illustration, presented in (33). Let Number Agree be X and Gender Agree be Y. If X precedes Y, and X targets the Num head in order to receive values for its unvalued features, the following operation Y will not be able to reach any constituents c-commanded by Num. The head targeted by the first Agree will therefore delimit the domain within which the next operation must apply.

(33)



As seen in (33), the CAD produces an opacity effect – if Num acts as a goal, all the phrases c-commanded by Num will be rendered inaccessible for further Agree operations. This has the crucial consequence that, if Agree for gender is ordered after Agree for number (cf. (31)), Gender Agree will not be able to target *n* because Number Agree will have rendered all the phrases c-commanded by Num opaque for this probe.[19]

The CAD can be viewed as an economy condition on Agree. Once the Agree operation with the highest priority has applied, the next Agree operation triggered by the same head needs to minimize its search domain. That is, the first Agree is allowed to seek for its most appropriate

participle heads a Part projection (Migdalski 2003, 2008; Bošković 2009) and carries probes for number and gender. The auxiliary, which I assume to be in T, only bears a probe for number and person features.

[19] The "probe" in (33) is intended to be neutral for the purpose of general illustration of the agreement patterns and is therefore not defined by a particular label. As we will see in Section 5, the probe can be anything ranging from adjective, determiner, another nominal modifier, to verbal participle, which makes the analysis of Agree universally applicable.

possible goal as far in its c-command domain as possible, while the following Agree must be as economical as it can and converge with whatever it manages to find. The CAD can be seen as a locality constraint parallel to constraints on movement such as *Shortest Move* (Richards 2001) or *Approach the Probe Principle* (Branigan 2012, 2013), which apply in case a head triggers more than one Move operation. After the first Move operation has been carried out, thereby creating a specifier as a landing site for the moved element, the element that is affected by the second Move needs to land as close as possible to the movement-triggering head, i.e. to "tuck in". I assume that Agree principles mirror Move locality principles.

Note that we are not dealing here with deactivation of the goal phrase, e.g. in the sense of Kalin and van Urk 2015, who assume that subjects are deactivated after all their ϕ-features have been targeted for agreement, or in the sense of Chomsky (2001)'s Activity Condition (where deactivation is a consequence of case assignment). Instead we have a restriction on the domains of the operation Agree itself, which is independent of the properties, or activity, of ϕ-features on a noun. Consequently, nothing prevents a feature targeted by an Agree from one head to be targeted again by another Agree from a different head, provided that the CAD is obeyed.

The final assumption on the nature of Agree concerns the cases in which the probe cannot find a goal at all. In the system above, the gender probe is always granted a second chance in case it does not manage to find appropriate features. Yet, since the NumP is assumed to be projected only if it hosts plural number features, and the [∗#:□∗] probe always needs to be discharged by an Agree operation, it may well happen that it does not find appropriate features and Agree does not result in valuation. Here, I follow Preminger 2014 in claiming that Agree is obligatory in the sense that it needs to be carried out once it is triggered, but it can apply vacuously if it does not find an appropriate goal, i.e. it can fail. In the case at hand, if the [∗#:□∗] probe does not find a phrase that contains number features, since it cannot be further reduced and trigger second-cycle Agree, the number value for the probe will be supplied as singular by inserting a default marker in the morphology.[20]

4.3 Deriving Agreement with Class II Nouns

With the theoretical assumptions in place, we can now return to the main puzzle of this paper, the split hybrid nouns in BCS. While in the singular they always trigger agreement according to their natural gender (masculine) (34a), in the plural their agreement can vary between natural (masculine) gender and grammatical (feminine) gender (34b).

(34) a. Vladik-**a** je juče stiga-**o**/*stigl-**a**.
bishop-MSG is yesterday arrive.PRT-MSG/arrive.PRT-FSG
'The bishop arrived yesterday.'

b. Vladik-**e** su juče stigl-**e**/stigl-**i**.
bishop-MPL are yesterday arrive.PRT-FPL/arrive.PRT-MPL
'Bishops arrived yesterday.'

[20] Similarly, Gender Agree can eventually fail, but only if there is no gender feature at all to be targeted and the probe still needs the value. Such a situation arises in impersonal constructions.

(i) Zahladilo je. / Svanulo je.
become.cold.PRT.NSG is. / dawn.PRT.NSG is
'It became cold. It dawned.'

I assume neuter gender to be the value provided by the morphology to signal the absence of gender on the agreement target, due to the failure to find gender features on the goal (Arsenijević 2016). In the cases at hand, such a situation usually does not arise as all the nouns under discussion have gender features that can potentially be targeted.

In the sections to follow, I will show in detail how the assumptions outlined above conspire to derive these patterns, as well as how all the other patterns of agreement of Class II nouns fall out naturally from the account. The derivations will use an abstract probe, which, as we will see in Section 5, can stand for any probe in the language that agrees in gender and number. Recall that the patterns we want to derive are the following:

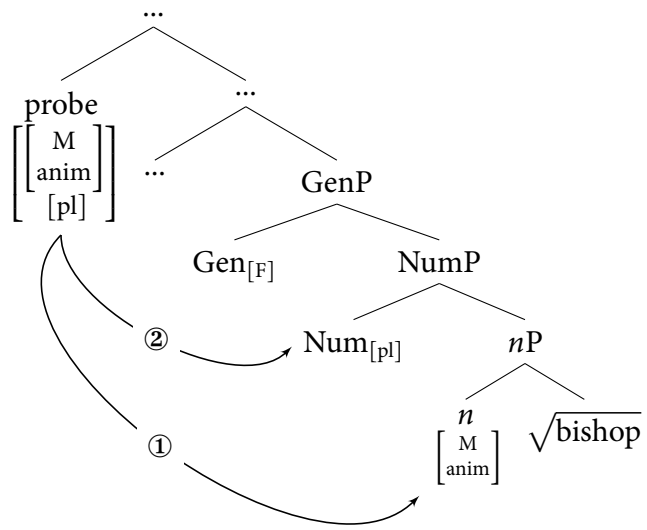
Example	*nat. gen*	GRAMM. GEN	Agreement	
			SG	PL
2.1 *vladika* 'bishop'	*masc*	FEM	*masc*	*masc* / FEM
2.2 *majka* 'mother'	*fem*	FEM	*fem*	*fem* / FEM
2.3 *budala* 'fool'	*masc or fem*	FEM	*masc* / *fem*	*masc*/*fem* or FEM
2.4 *stolica* 'chair'	*none*	FEM	FEM	FEM

Table 3: Summary of gender agreement patterns with Class II nouns

4.3.1 Split-hybrid nouns: Nouns with natural masculine gender

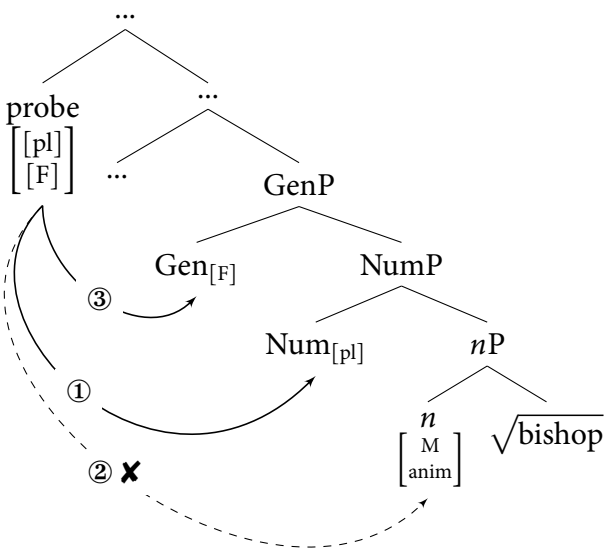
In order to successfully derive the central puzzle of this paper (34), the theory of agreement must be able to explain why alternations between natural and grammatical gender with split hybrid nouns can occur only in the plural. Starting with the more interesting **plural agreement**, in this section I show that the order in which Agree operations apply has a direct impact on the resulting gender value on the verb. If Gender Agree precedes Number Agree, this will yield natural gender agreement, while the reverse order of operations will result in Number Agree bleeding agreement with natural gender, forcing instead the grammatical gender valuation.
Recall that natural gender on split hybrid nouns is specified as [M[anim]] on their *n*P, reflecting the fact that these nouns denote male entities, while GenP is specified with the [F] grammatical gender. The order in which Gender Agree precedes Number Agree can be formalized such that [∗gen:□[anim:□]∗] probe is discharged before the [∗#:□∗] probe. Since the *n*P contains both gender and animacy features, valuation of the probe with natural gender will be successful. Number Agree is carried out afterwards, supplying the [#:pl] feature on the probe (this operation will be successful as it applies to a domain dominating *n*P). The whole process results in natural masculine plural agreement.

(35) **Natural gender agreement:** [∗gen:□[anim:□]∗] > [∗#:□∗]



Consider now how the reverse order of application of the two operations yields grammatical feminine agreement. Ordering number probe before gender probe leads to targeting Num first. Respecting the *Condition on Agree Domains* (32), gender probe can only target phrases higher than Num in the structure. As (36) shows, after discharging the [∗#:□∗] probe, any subsequent Agree operation cannot target anything below NumP. This is why Gender Agree cannot target the lower *n*P and consequently cannot reach the natural gender feature value. Gender Agree therefore fails to find a goal, which initiates the second cycle of Agree. In this cycle, the gender probe is reduced in such a way to look only for a [∗gen:□∗] feature. A feature of this type is accessible on GenP, which provides the probe with the grammatical feminine value.

(36) **Grammatical gender agreement:** [∗#:□∗] > [∗gen:□[anim:□]∗]

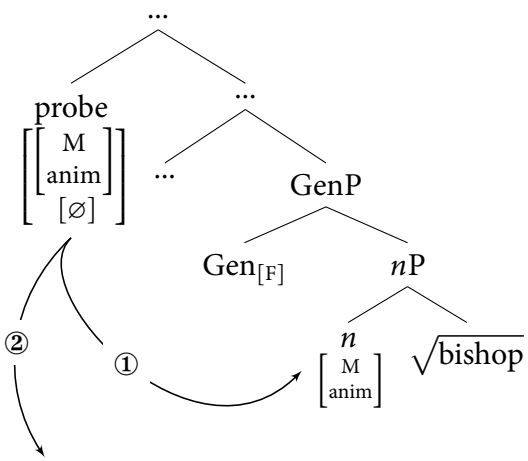


This mechanism of gender agreement illustrates the Relativized Minimality (Rizzi 1990) effects in relativized probing for gender (already noted by Béjar 2003 and Preminger 2014 for person and number): even though grammatical gender is the closer potential goal for the gender probe, it is skipped since it does not carry the right kind of feature. There is another feature lower in the structure which is a better match. As a result, the grammatical gender feature does not act

as a defective intervener. Moreover, we are not forced to say that NumP blocks natural gender agreement by carrying a "wrong kind of feature". Therefore, the mechanism above shows that instead of being caused by defective features, intervention effects can be derived from independent theoretical assumptions, as a result of a conspiracy of relativized probing, separate probing for number and gender and the Condition on Agree Domains.

As for the **singular number**, recall that here NumP is assumed not to be projected. If Gender Agree precedes Number Agree, gender probe will be discharged first and it will be valued by the natural gender feature of the *n*P. The subsequent number probe will not find a goal as there is no number feature on the DP. Number Agree thus fails and singular is provided post-syntactically by default.

(37) **Singular agreement:** [∗gen:□[anim:□]∗] > [∗#:□∗]



The result of this process is that the gender probe will always be valued by natural gender, as there is no NumP to act as an intervener. This is the desired result since such nouns invariably trigger natural masculine agreement in the singular. The same result is obtained by the opposite order of operations. Since NumP is not projected in the singular, the [∗#:□∗] probe, will not find a corresponding valued feature. This Agree operation fails and the unvalued number feature is realized as singular by default. None of the phrases is affected by Number Agree, so the subsequent gender probe can reach *n*P and the natural masculine gender on it. The derivation will thus have the same result as the one in (37), with the only difference being the order of probing. This ensures that the gender probe will always be valued by natural gender in the singular, where NumP cannot intervene with gender agreement with the *n*P.

To sum up, the optionality in gender agreement with this group of nouns provides evidence that Number Agree and Gender Agree interact in syntax and their different orderings yield different results. When Gender Agree is ordered first, natural gender will result because there is nothing to prevent the probe from targeting the *n*P. If the order is reversed, Number Agree will bleed (natural) Gender Agree by targeting the NumP first, leaving grammatical gender agreement as the only option. Moreover, in the singular, natural gender agreement is in fact the only option – without the NumP, there is nothing to bleed natural gender agreement.[21]

[21] A prediction of the analysis pointed out by an anonymous reviewer is that there should be no masculine Class II nouns that show invariable masculine or feminine agreement in both singular and plural, as we always expect variation in the plural. The only way to get masculine agreement consistently in both contexts is to say that for some speakers only the order Gender Agree > Number Agree is possible, but then we cannot capture the fact that these nouns are hybrids (which for such speakers they might even not be). Conversely, for the speakers who do not allow masculine agreement in the plural, it would have to be said that they only allow the order Number Agree >

4.3.2 Nouns with natural feminine gender

Recall that nouns with natural feminine gender such as *majka* 'mother' or *devojka* 'girl' always consistently trigger feminine agreement (cf. Section 2.2). I have proposed that such nouns have the features [F[anim]] on their *n*P, and [F] on the GenP.

(38) $[_{\text{DP}}\ \text{D}\ [_{\text{GenP}}\ \text{Gen}_{[\text{F}]}\ [_{n\text{P}}\ n_{m[\text{F[anim]}]}\ \sqrt{\text{mother}}\ ]]]$

As with the previous group, the result of Gender Agree applying before Number Agree will be the natural gender valuation of the probe. Since the *n*P contains both gender and animacy features, valuation of the gender probe with natural gender will be successful. The Number Agree will also be successful as it applies to a domain dominating *n*P, which is still accessible for probing, parallel to the situation in the previous section, derived in (35).

The reverse order of Agree operations leads to grammatical gender agreement, but the surface result is the same with these nouns, as both gender features are feminine. The process is the same as in (36) above: Number Agree provides the value for the unvalued number feature. This forces the next Agree operation to apply to a higher domain, where it does not find natural gender features. As a result, another cycle of Gender Agree is triggered, where the reduced [∗gen:□∗] feature is valued by Gen as feminine.

With singular nouns, given that NumP is not projected, Number Agree will not find an appropriate goal, which results in its vacuous application, just like in (37) above. The singular feature will be provided by default, while the result of gender agreement will always be natural feminine gender provided by the *n*P.

With these two agreement strategies for nouns with natural feminine gender, the same result is achieved on the surface, i.e. valuing the gender probe either as [F[anim]] or [F] will require insertion of a feminine exponent. Consequently, both strategies result in feminine agreement, one reflecting feminine natural gender and the other feminine grammatical gender in the plural. In contrast, the feminine agreement triggered in the singular reflects natural gender alone.

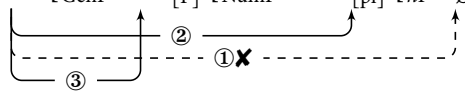
4.3.3 Nouns with grammatical feminine gender

Recall that nouns with grammatical feminine gender, such as *stolica* 'chair' are assumed to have no gender features on *n*P and only the [F] value on GenP (cf. Section 2.4, example (17)). GenP is therefore the only possible target for Gender Agree, which correctly derives the lack of alternations in agreement with these nouns. The interesting case is the order where Gender Agree precedes Number Agree. Since the natural gender probe is complex, and the mechanism of relativized probing demands for it to find a goal with corresponding feature specification, in the case of grammatically feminine nouns, the probe will not find such a goal anywhere on the DP, which leads to a failure of valuation on the first cycle of Gender Agree (cf. ① in (39)). The failure of agreement in natural gender triggers the new cycle of Gender Agree in which the probe looks only for [∗gen:□∗] feature. Yet, since Number Agree is the next operation in line, I assume it applies right after Agree for natural gender (② in (39)). The second cycle of Gender Agree follows,

Gender Agree. While this might be said for BCS, the reviewer draws attention to a counterexample from Slovenian: while nouns like *starešina* 'senior' behave like hybrid nouns described here, nouns like *vojvoda* 'duke' consistently trigger masculine agreement with both numbers. Since *starešina*-type nouns show that both orders are possible in Slovenian, it would be incorrect to say that for the *vojvoda*-type only one order is available, as the order of Agree is independent from the goal they would potentially target. The difference between these two nouns would have to be in their structure. I would tentatively assume that the *vojvoda*-type nouns in Slovenian are missing the feminine feature in their structure. However, whether this is the right approach to this counterexample is an important question I leave for further research.

copying the [F] feature from Gen.

(39) **Grammatical feminine gender**: [∗gen:□[anim:□]∗] > [∗#:□∗]
[probe [$_{\text{GenP}}$ Gen$_{[\text{F}]}$ [$_{\text{NumP}}$ Num$_{[\text{pl}]}$ [$_{n\text{P}}$ $n_{\varnothing}$ $\sqrt{\text{chair}}$]]]]



Note that above we might have another case of indeterminacy of rule application. An additional assumption I put forward is that Number Agree must be carried out before the second cycle of Gender Agree. This could be made to fall out of one of two intuitive distinctions between the two types of Agree operations. It follows simply from cyclicity: essentially all instances of first cycle Agree must precede instances of second cycle Agree. Alternatively, we might argue that Number Agree, being an obligatory operation, is privileged to occur before the second cycle of Gender Agree, which is a repair strategy. In any case, after a successful valuation of the probe's number features, the gender probe is ready to carry out the second cycle of gender agreement, which results in grammatical gender specification of the given probe.
With the reverse order of operations, the derivation involves the same steps as (36) above. After the number probe has been valued successfully, the *n*P cannot be targeted any more, in which case natural gender agreement fails. The second cycle of Gender Agree is initiated, where [∗gen:□∗] is valued by the gender feature on GenP.

4.3.4 Gender variable nouns

Recall that gender variable nouns (cf. Section 2.3) can bear either masculine or feminine natural gender, as well as only grammatical gender, without any change in form, and the way to disambiguate between the three kinds of gender is to look at the context and agreement they trigger. It was proposed at the end of Section 4.1.1 that roots that derive these nouns are optionally licensed under three different nominalizers. If a root merges with n_m, the noun it creates is assigned natural masculine gender, n_f assigns natural feminine gender to the noun, whereas $n_{\varnothing}$ yields a grammatically feminine noun, as it does not have any natural gender specified on *n*P:

(40) a. [$_{\text{DP}}$ D [$_{\text{GenP}}$ Gen$_{[\text{F}]}$ [$_{n\text{P}}$ $n_{m[\text{M[anim]}]}$ $\sqrt{\text{fool}}$]]] ⇒ natural masculine
b. [$_{\text{DP}}$ D [$_{\text{GenP}}$ Gen$_{[\text{F}]}$ [$_{n\text{P}}$ $n_{m[\text{F[anim]}]}$ $\sqrt{\text{fool}}$]]] ⇒ natural feminine
c. [$_{\text{DP}}$ D [$_{\text{GenP}}$ Gen$_{[\text{F}]}$ [$_{n\text{P}}$ $n_{\varnothing}$ $\sqrt{\text{fool}}$]]] ⇒ grammatical feminine

As a result, depending on the nominalizer the root merges with, the newly-created noun will be subject to corresponding consequences concerning its agreement patterns. If a noun is assigned natural masculine gender under n_m, the agreement it triggers follows the patterns from Section 4.3.1. If Gender Agree precedes Number Agree, the probe's gender feature will be valued by natural masculine gender. The reverse order of operations will result in Number Agree bleeding Gender Agree and in valuation of the probe's gender feature by grammatical feminine gender. Similarly, if a noun is assigned natural feminine gender under n_f, the agreement patterns will reflect those presented in Section 4.3.2.[22] Finally, if assigned grammatical feminine, the only target for gender features on the noun is GenP, which means that it can only ever trigger grammatical feminine agreement (like the nouns in 4.3.3). This accounts for examples like (9), where the gender of the referent is irrelevant.

[22] As mentioned in footnote 4, in order to account for mixed groups, certain extensions of the account would have to be developed to explain how gender features of mixed groups are resolved. I leave this issue to further research.

5 Deriving Corbett's Agreement Hierarchy Effects

This section applies the account to DP-internal and participial agreement, showing that the proposed mechanism can derive some of the effects of the *Agreement Hierarchy*. As repeated in (41), there is a restriction on mismatches between agreement on nominal modifiers and verbs. If the nominal modifier agrees in grammatical gender, the verb can show either natural or grammatical agreement, as in (41a). If the modifier shows natural gender agreement, the verb must agree with the same gender, it cannot show grammatical agreement (41b).

(41) a. On-**e** vladik-**e** su me juče posetil-**e**/posetil-**i**.
those-FPL bishop-PL are me yesterday visit.PRT-FPL/visit.PRT-MPL
'Those bishops visited me yesterday.'

b. ?On-**i** vladik-**e** su me juče posetil-**i**/*posetil-**e**.
those-MPL bishop-PL are me yesterday visit.PRT-MPL/visit.PRT-FPL
'Those bishops visited me yesterday.'

The ungrammaticality of (41) is in accordance with the Agreement Hierarchy (Corbett 1979).

(42) The Agreement Hierarchy:
attributive > predicate > relative pronoun > personal pronoun
'The possibility of syntactic agreement decreases monotonically from left to right. The further left the element on the hierarchy, the more likely syntactic agreement is to occur, the further right, the more likely semantic agreement.' (Corbett 1979:204)

The monotonic decrease from Corbett's definition above means, for instance, that if the attributive element shows grammatical (syntactic) gender agreement, all the elements to the right on the hierarchy can still show either grammatical or semantic agreement. But if the attributive shows semantic gender, all the elements to the right must show semantic agreement, too. I focus on deriving this monotonicity, i.e. the obligatoriness of natural gender agreement on the verb once it is established on the nominal modifier, cf. (41b).[23]
Following Baker 2008; Danon 2011; Pesetsky 2013; Landau 2016; Smith 2017, among others, let us assume that every nominal modifier (adjective, possessive, demonstrative etc.) is a probe.[24] Let us assume further that all of them probe separately for gender and number and that the Agree operations they trigger can apply in different orders. Finally, I assume that after a modifier has carried out Agree, the values it receives become available for higher probes. For reasons of exposition and clarity, in this section agreement possibilities will be illustrated on demonstratives,

[23] Why grammatical gender agreement is preferred on nominal modifiers and why the verb is more likely to show natural gender agreement is something that need not depend on factors related to the workings of narrow syntax. This account focuses on deriving the possible options of agreement available to a speaker at the given time, but why exactly nominal modifiers seem to be more restricted in their preference for agreement in formal features is an issue to be tackled in further research. See also Wechsler and Zlatić 2003; Arsenijević and Gračanin-Yuksek 2016; Despić 2017 and Puškar 2017 for further detail and possible explanations.

[24] In BCS most of the modifiers (adjectives, possessives, demonstratives and pronominal modifiers) show similar syntactic behaviour and share the same inflectional morphology (cf. Progovac 1998:173). I assume that for the purposes of agreement they are essentially the same elements (but see Progovac 1998; Bošković 2013, 2016; Despić 2011, 2013 for more detail). I follow Svenonius 1994; Bošković 2013; Norris 2014 in treating adjectives as adjuncts (pace Abney 1987; Bernstein 1993; Cinque 1994). The precise place of adjunction is not relevant for the present purposes. Nevertheless, since nominal modifiers can show agreement with both natural and grammatical gender of the noun, this means that the projections hosting those features have to be available as goals to the adjectival probe, i.e. below it in the structure. In our system, this means that the adjectives must adjoin above the grammatical-gender-bearing head Gen.

as D elements, which can later be targeted by Part(icipial) probes.[25]
Starting from the restricted aspect of the Agreement Hierarchy, let us first derive (41b), where natural gender is present at the DP, and the verb can agree only with this gender, the grammatical one being unavailable. Recall that natural gender agreement was always the result of the gender probe being released first. At the DP level then, Gender Agree will apply before Number Agree, resulting in valuing D's features as masculine:

(43) **Natural masculine gender:** [∗gen:□[anim:□]∗] > [∗#:□∗]
[$_{DP}$ D [$_{GenP}$ Gen$_{[F]}$ [$_{NumP}$ Num$_{[pl]}$ [$_{nP}$ $n_{m[M[anim]]}$ $\sqrt{\text{bishop}}$]]]]
② ①

After this process, D carries the features [M[anim],pl]. The same order of operations applies on the participle. Since DP now contains natural masculine gender, this is the feature that will be targeted by the gender probe. The participle also has to look no further to find a number value, since this value is also present on D (44). The goal for Number Agree is not lower than the goal targeted by the previous Agree operation by the same head, hence this derivation obeys the Condition on Agree Domains.

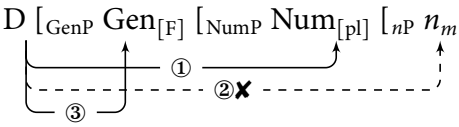
(44) **Natural masculine gender:** [∗gen:□[anim:□]∗] > [∗#:□∗]
[$_{PartP}$ Part [$_{vP}$ [$_{DP}$ D$_{[M[anim][pl]]}$] [$_{v'}$ v [$_{VP}$ ...]]]]
① ②

Even if the order of Agree operations were reversed at the PartP level, it would still yield the same result, as the natural masculine gender is the closer goal for Gender Agree and the access to it is not blocked by the number marking on the noun.[26]
After showing how natural gender is obligatory on the verb once it is established on DP, we are left with accounting for optionality of agreement in case D agrees with the grammatical gender of the noun. Grammatical gender agreement, as before, results from the order Number Agree > Gender Agree. Due to the opacity effects caused by NumP, D's gender feature is valued by grammatical gender [F].

[25] See however Bošković 2013, 2016 and Despić 2011, 2013, who have argued that possessives and demonstratives are not D-elements in BCS, but rather elements of the same category as adjectives. This view is based on the claim that DP is not projected in this language, hence there is no dedicated phrase to host these categories.

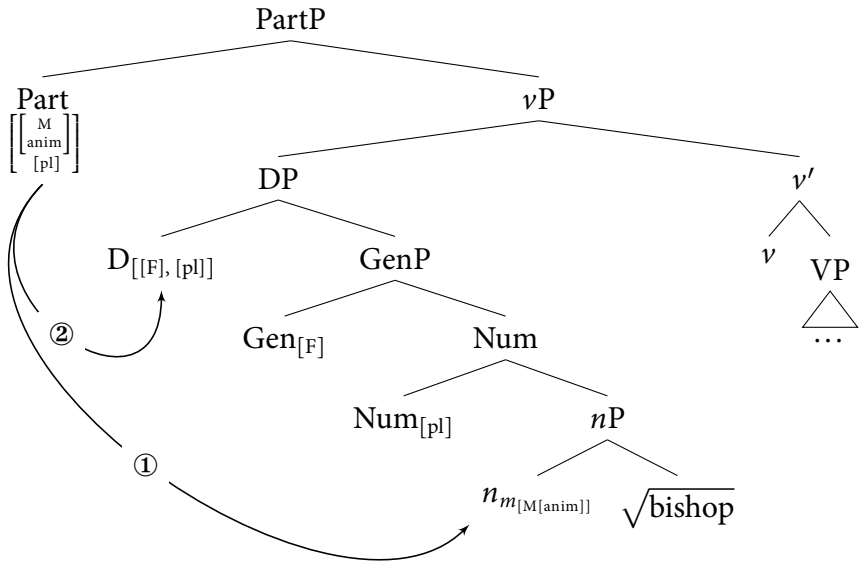
[26] A reviewer wonders about the interaction of person agreement with Gender and Number Agree. If, following previous accounts (e.g. Béjar 2003; Harbour 2008; Preminger 2014), we assume that Person Agree has primacy with respect to the other two operations, we would expect it to interact with them by delimiting the domains for Gender Agree and Number Agree. This should not be a problem for PartP agreement in BCS since the participle only shows gender and number agreement and no morphological reflection of person agreement, and therefore person probe can be assumed to be absent here. The auxiliary, on the other hand, shows person and number features, but not gender. We could assume that the auxiliary (or T) carries person and number probe. Whether their ordering is strict or variable should make no difference for the final outcome of agreement since both features will be present at DP (assuming also that person is a feature "born" in D).

(45) **Grammatical feminine gender:** [∗#:□∗] > [∗gen:□[anim:□]∗]



As a result, the features [F,pl] are present on DP at the point when Part probes. Under the same order of operations, Number Agree will find the number value on D and thereby delimit the search space for Gender Agree, by which this operation will target the grammatical feminine gender present at DP. However, if the order of operations is changed on the participle, and Gender Agree precedes Number Agree on this head, this will result in natural gender agreement on Part. The gender probe will reach the *n*P in its search for natural gender, since there is nothing to intervene (both the gender on GenP and the gender on DP are less specified). The number probe will collect the closer number value from D and the derivation will result in a tolerated mismatch between adjectival and verbal agreement.

(46) **Natural masculine gender:** [∗gen:□[anim:□]∗] > [∗#:□∗]



We can thus see the effects of Relativized Minimality and the absence of defective intervention even in the derivation above, as the higher, but less complex, gender does not interrupt agreement with the lower and the preferred one. The benefit of the approach is that it unifies DP-internal and DP-external agreement under the same mechanism. Moreover, it derives all the attested patterns and rules out the impossible one, showing that Agreement Hierarchy does not have to be postulated as a grammatical primitive, but can instead be derived in a principled way.

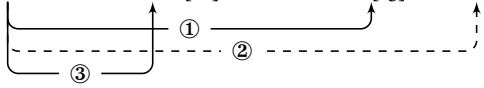
6 Extensions of the Analysis: Hybrid Agreement in Russian

This section includes a proposal on how the current account extends to Russian, another Slavic language akin to BCS in its gender assignment principles (Corbett 1991:34). A well-known example of hybrid agreement in Russian comes from the agreement patterns with nouns like *vrač* 'doctor', *direktor* 'director', *kosmonavt* 'astronaut', *muzykoved* 'musicologist', *feldšer* 'medical attendant', *fotograf* 'photographer', etc. (Crockett 1976:92). The nouns in question have fixed masculine grammatical gender, but they are underspecified for the natural one, which means that they can be assigned appropriate natural gender based on the gender of the discourse referent (e.g. feminine as in (47)). Agreement Hierarchy effects can observed with these nouns as well.

If the adjective shows grammatical masculine agreement, the verb can show either masculine or natural feminine gender (47a). If the adjective shows natural feminine agreement, the verb must show feminine gender too (47b).

(47) a. Novyj vrač prišël/prišla.
new.MSG doctor arrived.MSG/arrived.FSG
'The new (female) doctor arrived.'
b. Novaja vrač prišla/*prišël.
new.FSG doctor arrived.FSG/arrived.MSG
'The new (female) doctor arrived.' (Russian, Pesetsky 2013:36)

Similarly to BCS nouns, a noun of the *vrač*-type referring to a female can be assumed to have a feminine natural gender feature on *n*P and grammatical masculine introduced at GenP. Recall that singular was argued to be the absence of number in BCS and the NumP was postulated only in the plural. Grammatical gender agreement with plural nouns was a direct consequence of this difference, namely, targeting NumP before *n*P for Agree meant that the Num head intervened for Agree with natural gender only in the plural.
Since the the *vrač*-type nouns in Russian are true hybrids, alternating both in the singular and in the plural, a straightforward way to capture their patterns would be to claim that singular is not just the absence of number in Russian but is in fact a real feature projected on NumP. Thus, having NumP projected in both the singular and plural allows it to intervene for Agree, yielding grammatical gender agreement as an option in both numbers. The empirical evidence towards different behavior of singular in Russian comes, for instance, from number agreement with conjoined nouns, where Russian allows for singular agreement with two conjoined singular NPs, while BCS does not (Bošković 2010). Moreover, gender feature distinctions are neutralized in the plural on verbs and nominal modifiers in Russian, suggesting a different degree in markedness between the two number features in the two languages. Additional justification for this distinction would have to come from morphological evidence such as contextual allomorphy, syncretism etc., which would show sensitivity to the presence or absence of [sg] feature on nouns in Russian and BCS. Since the fusional morphology of the two languages makes such phenomena difficult to identify, I leave this issue for further research.
The agreement patterns from (47a) can be derived under the order where Number Agree precedes Gender Agree, as in (48). After discharging the [∗#:□∗] probe, any subsequent Agree operation from the modifier cannot apply to a phrase c-commanded by Num, which was the goal of the first Agree. Gender Agree cannot target the lower *n*P and therefore cannot reach the natural gender feature. Gender Agree thus fails, which initiates the second cycle of Agree. The gender probe is now reduced and looks only for [∗gen:□∗] feature. A feature of this type is accessible on GenP, which provides D or the Adj(ective) with the grammatical masculine value.

(48) **Grammatical masculine gender:** [∗#:□∗] > [∗gen:□[anim:□]∗]
[$_{DP}$ D/Adj [$_{GenP}$ Gen$_{[M]}$ [$_{NumP}$ Num$_{[sg]}$ [$_{nP}$ $n_{m[F[anim]]}$ $\sqrt{\text{doctor}}$]]]]


The participle will thereafter encounter a modifier or D which has the grammatical masculine feature, in addition to the grammatical gender on Gen and a natural feminine gender on *n*. If the order of operations is the same, Number Agree will bleed the agreement with natural gender and the result will be the valuation of Part's features with grammatical masculine gender. If however, the order of operations is reversed on Part, Gender Agree would be able to target the natural gender on *n* and number on Num, which would result in natural feminine agreement

and correctly derive the optionality of verbal agreement, in the same manner as in (46).
To derive the pattern in (47b), consider the order where Gender Agree precedes Number Agree, as in (49). Since the *n*P contains both gender and animacy features, valuation of the first-discharged gender probe on D or Adj with natural gender will be successful. The subsequent Number Agree will also be successful as it applies to a domain dominating *n*P.

(49) **Natural feminine gender:** [∗gen:□[anim:□]∗] ≻ [∗#:□∗]
[$_{DP}$ D/Adj [$_{GenP}$ Gen$_{[M]}$ [$_{NumP}$ Num$_{[sg]}$ [$_{nP}$ $n_{m[F[anim]]}$ $\sqrt{\text{doctor}}$]]]]
① ②

As a result, the modifier's gender feature is valued by natural feminine gender and singular number. Feminine agreement will then be the only option for the verbal probes as natural gender feature [F[anim]] on the modifier can value the participle's [∗gen:□[anim:□]∗] probe under any order of operations as the closest matching goal. The derivations sketched here thus show that the proposal on number and gender agreement interaction outlined in this paper can be extended to cover a wider range of data, accounting for hybrid agreement patterns in other languages with a mixed gender assignment system.
Agreement with the *vrač*-type nouns in Russian has been formally analyzed in accounts of Steriopolo and Wiltschko (2010); Matushansky (2013); Pesetsky (2013); Landau (2016), among others. What all these accounts share is the proposal that natural gender with hybrid nouns is introduced at a functional projection higher than grammatical gender and that the higher gender can override the lower one. The higher gender is either on DP for Steriopolo and Wiltschko (2010) or on a "feminizing head" introduced by Pesetsky (2013), or bundled with number on Num in Landau 2016. The latter two propose that agreement on the adjective depends on the height of its Merge-site relative to the gender-bearing heads. If the adjective is merged above the grammatical gender, but below natural, it will only be able to "see" the lower gender and agree with it (50a). Natural gender agreement on the adjective results if a) the head with natural gender is present and b) if the adjective is merged above the natural-gender bearing head (the feminizing head for Pesetsky and the NumP for Landau) (50b).

(50) a. [$_{DP}$ D ... [$_{(Nat)GenP}$ (Nat)Gen ... [Adj$_{[gramm.gen]}$ ... [$_{NP}$ N$_{[gramm.gen]}$]]]]
b. [$_{DP}$ D ... [Adj$_{[nat.gen]}$ ... [$_{(Nat)GenP}$ (Nat)Gen [$_{NP}$ N$_{[gramm.gen]}$]]]]

Natural gender can thus be merged optionally. If it is present, the verb only sees the natural gender, as the higher and closer one. There can therefore be no such situation in which the adjective agrees with the higher natural gender as in (50b), but the verb agrees with the lower grammatical gender, which correctly derives the restrictions of Agreement Hierarchy, cf. (47b). However, an account along these lines would run into problems when faced with BCS split-hybrid nouns. The obligatoriness of natural gender agreement in the singular implies that the phrase carrying the natural gender should be present at all times. Furthermore, if this phrase is always present and it is located above the grammatical gender, we would have no way of deriving optionality in the plural, as the access to grammatical gender would always be blocked, since it would be overwritten by the higher natural gender, which would always be the closest potential goal. It can thus be seen that a derivational account has the benefit of accounting for a wider set of data, capturing the data from both Russian and BCS, circumventing thereby the limitations of the configurational accounts proposed in the previous literature.[27]

[27] Recent accounts by Smith (2015, 2017) and Wurmbrand (2017) derive mixed agreement effects not by means of the position, but rather by the quality the features have. One of the main assumptions that these accounts draw on is that ϕ-features can be *interpretable* (*i*F) – what I have been calling 'natural' features, and *uninterpretable* (*u*F), what I

6.1 Other (Hybrid) Nouns in BCS

Hybrid agreement appears with other types of nouns in BCS, as noted by two anonymous reviewers. Apart from the Class II masculine nouns discussed above, other hybrid nouns in BCS include either collective nouns or nouns with irregular plural, most of which have been discussed by Wechsler and Zlatić (2003); Arsenijević (2016); Despić (2017). The nouns *braća* 'brothers.coll' and *deca* 'children.coll' are plural forms of nouns *brat* 'brother.m' and *dete* 'child.n'. While in the singular they look and behave like a masculine and a neuter noun and trigger masculine and neuter agreement respectively, their plural forms resemble those of feminine singular Class II nouns and decline as such. Since the noun *deca* 'children.coll' is rather idiosyncratic (see Wechsler and Zlatić 2003 for an extensive discussion of all the relevant differences), I illustrate the pattern with the noun *braća* 'brothers.coll'. While the participle can show either feminine singular or masculine plural agreement, the auxiliary is consistently plural.

(51) Braća su/*je se igrala/?igrali.
brothers.COLL are/*is refl play.PRT.FSG/play.PRT.MPL
'Brothers played together.'

I follow Arsenijević 2016 in treating this noun as a collective noun in the plural. We can formally model this distinction by assuming that in the singular, NumP is absent and the gender the noun has is natural masculine on *n*, which makes masculine agreement the only option. In the plural, we could assume that instead of the feature [#:pl], the NumP carries the feature [#:coll] (or an alternative thereof that would differentiate this noun from regular plurals and mass nouns). As the noun *brat* has grammatical masculine gender and a null ending, I assume its Gen must bear [M] grammatical gender, like other nouns with these properties. We can then assume the following structure for the *braća*-type nouns in the plural:

(52) $[_{\text{DP}}\ \text{D}\ [_{\text{GenP}}\ \text{Gen}_{\text{M}}\ [_{\text{NumP}}\ \text{Num}_{[\text{coll}]}\ [_{n\text{P}}\ n_{[\text{M,anim}]}\ \sqrt{\text{brat}}\ ]]]]$

Assuming the variable order of Agree operations, if Gender Agree applies first, it will value the participle's feature as [M,anim] and its number feature will be valued as [coll] subsequently. Since in this combination of features we have the masculine and (collective) plural marking, the masculine plural inflection marker will be inserted on the agreement target, which results in natural gender agreement on the participle. T will subsequently pick up the number feature from the DP, realizing it as plural marking on the auxiliary verb. Under the reverse order of operations, Number Agree will supply the [coll] feature on the Part probe. This operation will make it impossible for Gender Agree to reach the natural gender on the *n*P. I assume that the presence of the collective number and the absence of gender in this case will trigger the insertion of the *-a* ending on the participle, signaling that we are dealing with a collective noun (which in this case would override the realisation of grammatical masculine gender). This feature on T will be realized as plural on the auxiliary verb.[28]

have been calling 'grammatical' features. Both types of features can co-exist on a noun in the syntax, but at Spell-Out, interpretable features will be sent to the LF branch for interpretation, while the uninterpretable ones will be sent to the PF branch, in order to participate in the morphophonological shaping of the word. Such assumptions, however, prove unsuccessful at deriving agreement patterns with BCS split hybrid nouns. As mentioned before for Bošković 2009, what we would need in such an account is either an assumption that the availability of interpretable features for agreement depends on number, or that the presence of interpretable or uniterpretable features is conditioned by the number specification of the noun. It is not straightforward how this dependency could be captured without additional stipulations. See Puškar 2017 for further discussion.

[28] Alternatively, we can assume that these nouns are exceptionally assigned feminine gender in the plural, which would mean that their GenP is specified with [F]. This would yield feminine agreement on the agreement targets

Another type of collective nouns *gospoda* 'gentry' and *vlastela* 'aristocrats' also decline as nouns of Class II and have grammatical feminine gender. The collective nouns can trigger either feminine singular agreement (according to grammatical feminine gender, or according to collective feature), or masculine plural agreement:

(53) a. Gospoda je razgovarala.
gentry.COLL is talk.PRT.FSG
'The gentry talked.'
b. Gospoda su razgovarali.
gentry.COLL are talk.PRT.MPL
'The gentry talked.'

A possible way of analyzing these nouns would be to assume that they potentially have two number features. A 'natural' number could be located at *n*P together with natural masculine gender (cf. Acquaviva 2014; Kramer 2015), while the collective number feature is located at NumP, above which GenP carries the grammatical feminine gender. Their agreement patterns would then depend on whether the Agree operations target the lower natural gender and number, or the higher grammatical features.

Finally, having seen how the mechanism of agreement developed above has the potential to account for various hybrid agreement patterns both in BCS and other languages, it is important to demonstrate that the same mechanism derives the patterns of regular nouns in the language without any additional assumptions. The focus of the paper have been nouns of declension class II, since this is the class that hosts most of the relevant BCS hybrid nouns. However, as mentioned before, this language has two additional declension classes. Class I hosts nouns that are masculine, both animate and inanimate, and neuter, while Class III mostly comprises inanimate feminine nouns, with a couple of exceptions.

Nouns with grammatical masculine gender would be treated by the system as having the feature [M] encoded on their GenP. Inanimate nouns (such as *krov* 'roof', *papir* 'paper') are derived with an *n* that does not contain any gender features, while nouns with natural masculine gender (such as *otac* 'father' or *brat* 'brother') are a product of merging their roots with the *n* with natural masculine gender [M[anim]]. Similarly, neuter nouns, such as *more* 'sea', should be build up with a Gen specified as [N] and an empty *n*, while Class III feminine nouns, like *ljubav* 'love', would have a grammatical feminine [F] feature on Gen, and no features on the nominalizer. The classes, together with their representative examples, gender, and its formalisation are outlined in Table 4. The table also indicates the agreement patterns the representative nouns would trigger under the order where Gender Agree applies first (Gen > Num) and the opposite order of operations (Num > Gen).

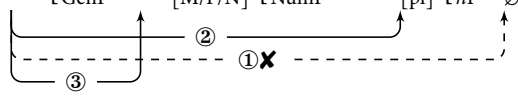
Nouns that have only grammatical gender, regardless of its value, can only trigger agreement with this gender, under any order (e.g. *krov* 'roof' [M], *kuća* 'house' [F] or *ljubav* 'love' [F] above). In the singular, Number Agree will always fail due to the lack of NumP with a singular value. The first instance of Gender Agree will also fail, due to the lack of a natural gender feature. Thus, the probe will be reduced to the root node [∗gen:□∗], which will be valued by the [M/F/N] feature of Gen on the second cycle. In the plural, Number Agree will always converge. If it applies first, Gender Agree will follow and target the GenP, obeying the CAD. If Gender Agree is the first in line, the derivations will reflect the one in (39), repeated in (54). After the first cycle of Gender Agree fails, Number Agree applies, followed by the second cycle of Gender Agree.

under the order Number Agree > Gender Agree, as before.

Noun	Gender		Formalization		Agreement (pl)	
class	*nat.*	gram.	*n*	Gen	Gen > Num	Num > Gen
I_m (*otac* 'father')	masc	masc	[M[anim]]	[M]	[M[anim]]	[M]
I_m (*krov* 'roof')	none	masc	∅	[M]	[M]	[M]
I_n (*more* 'sea')	none	neut	∅	[N]	[N]	[N]
II (*majka* 'mother')	fem	fem	[F[anim]]	[F]	[F[anim]]	[F]
II (*kuća* 'house')	none	fem	∅	[F]	[F]	[F]
II (*vladika* 'bishop')	masc	fem	[M[anim]]	[F]	[M[anim]]	[F]
III (*ljubav* 'love')	none	fem	∅	[F]	[F]	[F]

Table 4: Summary of nouns of all BCS classes and their agreement patterns

(54) **Grammatical masculine gender**: [∗gen:□[anim:□]∗] > [∗#:□∗]
[probe [$_{\text{GenP}}$ Gen$_{[\text{M/F/N}]}$ [$_{\text{NumP}}$ Num$_{[\text{pl}]}$ [$_{n\text{P}}$ $n_{\varnothing}$ $\sqrt{\text{chair}}$]]]]



Thus, grammatical gender agreement is the only convergent option if a noun does not contain any natural gender. On the other hand, if it does bear natural gender, the pattern will depend on the order of operations. With Class I animate masculine nouns like *otac* 'father' (as with feminine animate nouns in Section 4.3.2), natural [M[anim]] gender will always be obtained in the singular, whereas agreement in the plural will yield either the grammatical [M] or the natural [M[anim]] gender. Since masculine gender is realized by the same exponent on the probes, in the surface representation it will be opaque which of the two features was actually copied.
In sum, apart from being able to derive the optionality and its restrictions in agreement with hybrid nouns in BCS, the system developed in this paper straightforwardly extends to cover agreement with all types of nouns available in this language.

7 Conclusion

In this paper, I have argued that alternations in agreement patterns with hybrid nouns can be captured by a combination of the following sets of theoretical assumptions – precise positional specification of gender and number features within the DP, feature-geometric approach to ϕ-features, relativized probing and separate probing for different ϕ-features, with variation in the order of Agree operations and their cyclic application.
The account developed here successfully captures all the patterns for Class II nouns in BCS, presented in Section 2, as well as all the other regular nouns in the language. Crucially, the different orders of Agree operations will only yield different results in cases where the two gender features differ, as is the case with hybrid nouns. All other cases then become trivial, as the same result is expected for whatever order the Agree operations apply in.
An important benefit of the current proposal is that instead of postulating Agreement Hierarchy as a grammatical primitive, it offers formal tools for deriving the effects of this hierarchy in narrow syntax. Allowing Agree operations to apply in different orders at the DP will have a direct consequence on predicate agreement. If the advantage is given to Gender Agree on the DP, both the nominal modifiers and the predicate will bear natural gender features and conversely, if Number Agree is given the priority, natural gender will still be available to the predicate. These effects present good evidence against the idea of defective intervention in ϕ-feature agreement

and illustrate the Relativized Minimality effects in relativized probing (cf. Béjar 2003; Preminger 2014).

An additional advantage of the account proposed in this paper is that it offers novel possibilities for modeling parametric variation. The innovative component of the approach is the proposal that gender probe in BCS is relativized to search for natural gender features, which successfully accounts for the obligatoriness of natural gender agreement in the singular. Such an approach introduces the possibility of parametrizing languages in terms of the complexity of gender features and preferences of gender probes. In that sense, we can assume that the gender probe searches for natural gender in BCS and Russian, but may look for only grammatical gender in other languages. We have also seen that a difference between the DP in BCS and Russian can be stated in terms of whether a language projects singular as a proper feature on the NumP or not, which would constitute another locus of parametric variation between different languages. Finally, decomposing natural and grammatical gender into categorically related features of different complexity in the same way it has been done for person and number in previous accounts offers new analytic possibilities for the closer scrutiny and modeling of the interdependence of class, gender and animacy features and their geometric structural relations.

Ultimately, this account captures the mixed gender agreement patterns in BCS by means of a strictly derivational approach to agreement operations, making correct predictions for both singular and plural, for both hybrid and gender variable nouns, as well as for the nouns without clashing gender features. As its main contribution, this paper has intended to show that what may seem like a random alternation of agreement patterns on the surface, and may therefore seem to require either complex representations or complex Agree mechanisms, can in fact be handled by a combination of existing approaches to agreement, and derived in narrow syntax.

References

Abney, Steven Paul (1987): The English noun phrase in its sentential aspect. PhD thesis, Massachusetts Institute of Technology.

Ackema, Peter and Ad Neeleman (2015): The nature of third person and its consequences for agreement. . Talk presented at: Agreement Across Borders Conference, University of Zadar.

Acquaviva, Paolo (2014): 'Distributing roots: Listemes across components in Distributed Morphology', *Theoretical Linguistics* **40**(3/4), 277–286.

Acquaviva, Paulo (2009): Roots and lexicality in Distributed Morphology. *In:* A. Galani, D. Redinger and N. Yeo, eds, *York-Essex Morphology Meeting 2 York*. pp. 1–21.

Alexiadou, Artemis (2004): Inflectional class, gender, and DP internal structure. *In:* G. Müller, L. Gunkel and G. Zifonun, eds, *Explorations in nominal inflection*. Mouton de Gruyter, Berlin, pp. 21–49.

Alexiadou, Artemis and Gereon Müller (2008): Class features as probes. *In:* A. Bachrach and A. Nevins, eds, *Inflectional identity*. Oxford University Press, Oxford, pp. 101–155.

Alsina, Aleks and Boban Arsenijević (2012*a*): Hierarchies and competing generalizations in Serbo-Croatian hybrid agreement. In: *17th International Lexical Functional Grammar Conference (LFG2012)*. Udayana University, Bali.

Alsina, Alex and Boban Arsenijević (2012*b*): 'The two faces of agreement', *Language* **88**, 369–379.

Antón-Méndez, Ines, Janet L. Nicol and Merrill F. Garrett (2002): 'The relation between gender and number agreement processing', *Syntax* **5**, 1–25.

Aronoff, Mark (1994): *Morphology by Itself: Stems and Inflectional Classes*. MIT Press, Cambridge, Mass.

Arsenijević, Boban (2016): Gender as a grammaticalized classifier system: the case of the Serbo-Croatian neuter. Unpublished manuscript, University of Potsdam/University of Niš.

Arsenijević, Boban and Ivana Mitić (2016): 'On the (in)dependence of gender with respect to number in agreement with coordinated subjects', *Journal of Slavic Linguistics* **24**(1), 41–70.

Arsenijević, Boban and Marina Gračanin-Yuksek (2016): 'Agreement and the structure of relative clauses', *Glossa: a journal of general linguistics* **1**(1), 1–16.

Assmann, Anke, Doreen Georgi, Fabian Heck, Gereon Müller and Philipp Weisser (2015): 'Ergatives move too early: On an instance of opacity in syntax', *Syntax* **18**(4), 343–387.

Bailyn, John F. and Andrew Nevins (2008): Russian genitive plurals are impostors. *In:* A. Bachrach and A. Nevins, eds, *Inflectional Identities*. Oxford University Press, Oxford, pp. 237–270.

Baker, Mark C. (2008): *The syntax of Agreement and Concord*. Cambridge University Press, Cambridge.

Béjar, Susana (2003): Phi-syntax: A theory of agreement. PhD thesis, University of Toronto, Toronto.

Béjar, Susana and Milan Řezáč (2009): 'Cyclic Agree', *Linguistic Inquiry* **40**, 35–73.

Bernstein, Judy (1993): Topics in the syntax of nominal structure across Romance and Germanic languages. PhD thesis, City University of New York, New York.

Borer, Hagit (2005): *Structuring sense. Volume 1: In name only*. Oxford University Press, Oxford.

Bošković, Željko (2008): What will you have, DP or NP?. *In:* E. Elfner and M. Walkow, eds, *Proceedings of the North East Linguistic Society 37*. University of Massachusetts, Amherst, pp. 101–114.

Bošković, Željko (2009): 'Unifying first and last conjunct agreement', *Natural Language and Linguistic Theory* **27**(3), 455–496.

Bošković, Željko (2010): Conjunct-sensitive agreement: Serbo-Croatian vs Russian. *In:* G. Zybatow, P. Dudchuk, S. Minor and E. Pschehotskaya, eds, *Formal Studies in Slavic Linguistics. Proceedings of FDSL 7.5*. Peter Lang, Frankfurt am Main, pp. 31–48.

Bošković, Željko (2011): On unvalued uninterpretable features. In: *Proceedings of the North East Linguistic Society 39*. Graduate Linguistic Student Association, University of Massachusetts, Amherst, pp. 109–120.

Bošković, Željko (2013): Adjectival escapades. *In:* S. Franks, M. Dickinson, G. Fowler, M. Whitcombe and K. Zanon, eds, *Formal Approaches to Slavic Linguistics 21*. Michigan Slavic Publications, Ann Arbor, pp. 1–25.

Bošković, Željko (2016): 'Getting Really Edgy: On the Edge of the Edge', *Linguistic Inquiry* **47**(1), 1–33.

Branigan, Phil (2012): Approach the Probe. Ms., Memorial University of Newfoundland, St. Jon's.

Branigan, Phil (2013): Cyclicity and the Approach the Probe Principle. MS., Memorial University of Newfoundland, St. John's.

Carminati, Maria Nella (2005): 'Processing reflexes of the Feature Hierarchy (Person > Number > Gender) and implications for linguistic theory', *Lingua* **115**, 259Ű285.

Carstens, Vicki (2003): 'Rethinking Complementizer Agreement: Agree with the Case-Checked Goal', *Linguistic Inquiry* **34**(3), 393–412.

Caruso, Djurdjica Ž. (2012): The syntax of nominal expressions in articleless languages: A split-DP analysis of Croatian nouns. PhD thesis, University of Stuttgart, Stuttgart.

Chomsky, Noam (2000): Minimalist inquiries: The framework. *In:* R. Martin, D. Michaels and J. Uriagereka, eds, *Step by step: Essays on Minimalist syntax in honor of Howard Lasnik*. MIT Press, Cambridge, MA, pp. 89–155.

Chomsky, Noam (2001): Derivation by phase. *In:* M. Kenstowicz, ed., *Ken Hale: A life in language*. MIT Press, Cambridge, MA, pp. 1–52.

Cinque, Guglielmo (1994): On the evidence for partial N-movement in the Romance DP. *In:* G. Cinque, ed., *Paths towards universal grammar*. Georgetown University Press, Washington, D.C., pp. 85–110.

Corbett, Gerville (1991): *Gender*. Cambridge University Press, Cambridge.

Corbett, Greville (2010): Morphology-free syntax: Two potential counter-examples from Serbo-Croat. In: *A Linguist's Linguist: Studies in South Slavic Linguistics in Honor of E. Wayles Browne*. Slavica, Bloomington, Indiana.

Corbett, Greville (2015): Hybrid nouns and their complexity. *In:* J. Fleischer, E. Rieken and P. Widmer, eds, *Agreement from a diachronic perspective (Trends in linguistics studies and monographs)*. Mouton de Gruyter, Berlin, pp. 191–214.

Corbett, Greville G. (1979): 'The Agreement Hierarchy', *Journal of Linguistics* **15**, 203–224.

Crockett, Dina B (1976): *Agreement in contemporary standard Russian*. Slavica Publishers, Cambridge, MA.

Danon, Gabi (2011): 'Agreement and DP-internal Feature Distribution', *Syntax* **14**, 297–317.

Deal, Amy Rose (2015): Interaction and satisfaction in ϕ-agreement. *In:* T. Bui and D. Ozyildiz, eds, *Proceedings of NELS 45*. Vol. 1, Graduate Linguistic Student Association, University of Massachusetts, Amherst, pp. 179–192.

Despić, Miloje (2011): Syntax in the absence of Determiner Phrase. PhD thesis, University of Connecticut, Storrs.

Despić, Miloje (2013): 'Binding and the structure of NP in Serbo-Croatian', *Linguistic Inquiry* **44**, 239–270.

Despić, Miloje (2016): 'Coordinating gender: What can coordinate structure agreement tell us about gender?', *Studies in Polish Linguistics* **11**(1), 1–25.

Despić, Miloje (2017): 'Investigations in mixed agreement: Polite plurals, hybrid nouns and coordinate structures', *Morphology* **27**(3), 253–310.

Embick, David and Morris Halle (2005): On the status of stems in morphological theory. *In:* T. Geerts, I. von Ginneken and H. Jacobs, eds, *Romance Languages and Linguistic Theory 2003*. Benjamins, Amsterdam, pp. 37–62.

Fathi, Radwa and Jean Lowenstamm (2016): 'The gender assignment pattern of French nouns: Selection and allomorphy', *Morphology* **26**(3), 477–509.

Georgi, Doreen (2012): A uniform analysis of global and local argument encoding patterns: A local and cyclic approach. *In:* C. Constantinescu, B. L. Bruyn and K. Linke, eds, *Proceedings of ConSOLE VXII (2009, Nova Gorica)*. pp. 137–161.

Georgi, Doreen (2013): 'A relativized probing approach to person encoding in local scenarios', *Linguistic Variation* **12**(2), 153–210.

Georgi, Doreen (2014): Opaque interactions of Merge and Agree: On the nature and order of elementary operations. PhD thesis, University of Leipzig, Leipzig.

Halle, Morris and Alec Marantz (1993): Distributed Morphology and the pieces of inflection. *In:* K. Hale and S. J. Keyser, eds, *The View from Building 20: Essays in linguistics in honor of Sylvain Bromberger*. Number 111-176, MIT Press, Cambridge, MA.

Halle, Morris and Ora Matushansky (2006): 'The Morphophonology of Russian Adjectival Inflection', *Linguistic Inquiry* **37**(3), 351–404.

Harbour, Daniel (2008): *Morphosemantic number: From Kiowa noun classes to UG*. Springer, Dordrecht.

Harley, Heidi (2014): 'On the identity of roots', *Theoretical Linguistics* **40**(3), 225–276.

Harley, Heidi and Elizabeth Ritter (2002): 'Person and number in pronouns: A feature-geometric analysis', *Language* **78**(3), 482–526.

Harley, Heidi and Rolf Noyer (1999): 'State-of-the-article: Distributed Morphology', *Glot International* **3**, 3–9.

Harris, James W (1991): 'The exponence of gender in Spanish', *Linguistic Inquiry* **22**(1), 27–62.

Heck, Fabian and Gereon Müller (2007): Extremely local optimization. *In:* E. Brainbridge and B. Agbayani, eds, *Proceedings of WECOL 2006*. California State University, Fresno, pp. 170–183.

Kalin, Laura and Coppe van Urk (2015): 'Aspect splits without ergativity', *Natural Language and Linguistic Theory* **33**(2), 659–702.

Kihm, Alain (2005): Noun class, gender and the lexicon-syntax-morphology Interfsaces: A comparative study of Niger-Congo and Romance languages. *In:* K. R. Cinque, G., ed., *The Oxford handbook of comparative syntax*. Oxford University Press, Oxford, pp. 459–512.

Kramer, Ruth (2009): Definite markers, phi features and agreement: A morphosyntactic investigation of the Amharic DP. PhD thesis, University of California, Santa Cruz.

Kramer, Ruth (2015): *The Morphosyntax of Gender*. Oxford University Press, Oxford.

Kratzer, Angelika (2007): On the plurality of verbs. *In:* T. H.-Z. . J. Dölling, ed., *Event structures in linguistic form and interpretation*. Mouton de Gruyter, pp. 269–299.

Laka, Itziar (1993): The structure of inflection: a case study in Xo syntax. *In:* J. I. H. . J. O. de Urbina, ed., *Generative studies in Basque linguistics*. John Benjamins, Amsterdam, pp. 21–70.

Landau, Idan (2016): 'DP-internal semantic agreement: A configurational analysis', *Natural Language and Linguistic Theory* **34**(3), 975–1020.

Lowenstamm, Jean (2008): On little n, roots, and types of nouns. *In:* H. V. v. R. H. Hartmann, Jutta, ed., *Sounds of silence: Empty elements in syntax and phonology*. Elsevier, Amsterdam, pp. 105–144.

Marušič, Franc, Andrew Nevins and Bill Badecker (2015): 'The grammars of conjunction agreement in Slovenian', *Syntax* **18**(1), 39–77.

Matushansky, Ora (2013): Gender confusion. *In:* L. Cheng and N. Corver, eds, *Diagnosing Syntax*. Oxford University Press, Oxford, pp. 271–294.

McGinnis, Martha (2005): 'On markedness asymmetries in person and number', *Language* **81**, 699–718.

Migdalski, Krzysztof (2003): The Syntax of the l-Participle in Bulgarian, Serbo-Croatian and Polish. *In:* A. Cornilescu, ed., *Bucharest Working Papers in Linguistics: Syntax-Phonology 5.1*. pp. 54–64.

Migdalski, Krzysztof (2008): The Syntax of the l-participle in Bulgarian and Serbo-Croatian. *In:* G. Zybatow, L. Szucsich, U. Junghanns and R. Meyer, eds, *Formal Description of Slavic Languages. The Fifth Conference, Leipzig 2003*. Peter Lang Verlag, Frankfurt am Main.

Mrazović, Pavica and Zora Vukadinović (1990): *Gramatika srpskohrvatskog jezika za strance [The grammar of Serbo-Croatian for foreigners]*. Izdavačka knjižarnica Zorana Stojanovića, Novi Sad.

Müller, Gereon (2009): Ergativity, accusativity, and the order of Merge and Agree. *In:* K. K. Grohmann, ed., *Explorations of Phase Theory. Features and Arguments*. Mouton de Gruyter, Berlin, pp. 269–308.

Murphy, Andrew, Zorica Puškar and Matías Guzmán Naranjo (to appear): The structure of hybrid nouns in Bosnian/Croatian/Serbian: Experimental evidence from ellipsis. In: *Proceedings of FDSL 12.* .

Nevins, Andrew (2007): 'The representation of third person and its consequences for the person–

case constraint', *Natural Language and Linguistic Theory* **25**(3), 273–313.
Nevins, Andrew (2011): 'Multiple agree with clitics: Person complementarity vs. omnivorous number', *Natural Language and Linguistic Theory* **29**, 939–971.
Norris, Mark (2014): A theory of nominal concord. PhD thesis, University of California Santa Cruz.
Pesetsky, David (2013): *Russian case morphology and the syntactic categories*. MIT Press, Cambridge, MA.
Pesetsky, David and Esther Torrego (2007): The syntax of valuation and the interpretability of features. *In:* S. Karimi, V. Samiian and W. Wilkins, eds, *Phrasal and clausal architecture: Syntactic derivation and interpretation. In honor of Joseph E. Emonds*. John Benjamins, Amsterdam, pp. 262–294.
Picallo, M. Carme (1991): 'Nominals and nominalization in catalan', *Probus* **3**(3), 279–316.
Picallo, M. Carme (2008): 'Gender and number in Romance', *Lingue e Linguaggio* **7**(1), 47–66.
Preminger, Omer (2014): *Agreement and its Failures*. MIT Press, Cambridge, MA.
Progovac, Ljiljana (1998): 'Determiner phrase in a language without determiners', *Journal of Linguistics* **34**, 165–179.
Puškar, Zorica (2017): Hybrid agreement: Modelling variation, hierarchy effects and ϕ-feature mismatches. PhD thesis, Universität Leipzig.
Richards, Norvin (2001): *Movement in language: Interactions and architectures*. Oxford University Press, Oxford.
Ritter, Elizabeth (1993): 'Where's gender?', *Linguistic Inquiry* **24**(3), 795–803.
Rizzi, Luigi (1990): *Relativized minimality*. MIT Press, Cambridge.
Smith, Peter (2015): Feature Mismatches: Consequences for Syntax, Morphology and Semantics. PhD thesis, University of Connecticut.
Smith, Peter (2017): Possible and Impossible Agreement Mismatches. MS, Göthe Universität Frankfurt.
Stanković, Branimir (2014): Arguments for DP-analysis of Serbo-Croatian nominal expressions. *In:* L. Veselovská and M. Janebová, eds, *Nominal structures: All in complex DPs*. Palacký University, Olomouc, pp. 29–48.
Stanojčić, Živojin and Ljubomir Popović (1992): *Gramatika srpskoga jezika [The grammar of Serbian language]*. Zavod za udžbenike i nastavna sredstva, Belgrade, Novi Sad.
Steriopolo, Olga and Martina Wiltschko (2010): Distributed GENDER hypothesis. *In:* G. Zybatow, P. Dudchuk, S. Minor and E. Pschehotskaya, eds, *Formal Studies in Slavic Linguistics. Proceedings of FDSL 7.5*. Peter Lang, New York, pp. 155–172.
Stevanović, Mihailo (1989): *Savremeni srpskohrvatski jezik [Contermporary Serbo-Croatian language]*. IRO Naučna knjiga, Belgrade.
Svenonius, Peter (1994): The structural location of the attributive adjective. *In:* E. Duncan, Donka and P. S. Farkas, eds, *The proceedings of the twelfth west coast conference on formal linguistics*. CSLI, Stanford University, pp. 439–454.
Řezáč, Milan (2004): Elements of cyclic Agree. PhD thesis, University of Toronto.
Wechsler, Stephen and Larisa Zlatić (2000): 'A theory of agreement and its application to Serbo-Croatian', *Language* **76**, 799–832.
Wechsler, Stephen and Larisa Zlatić (2003): *The many faces of agreement*. Center for the Study of Language and Information, Stanford.
Willer-Gold, Jana, Boban Arsenijević, Mia Batinić, Nermina Čordalija, Marijana Kresić, Nedžad Leko, Lanko Marušič, Tanja Milićev, Nataša Milićević, Ivana Mitić, Andrew Nevins, Anita Peti-Stantić, Branimir Stanković, Tina Šuligoj and Jelena Tušek (2016): 'Morphosyntactic pro-

duction of Coordination Agreement in South Slavic: From Theory to Experiments', *Journal of Slavic Linguistics* **24**(1), 187–224.

Wurmbrand, Susi (2017): Formal and semantic agreement in syntax: A dual feature approach. *In:* J. Emonds and M. Janebová, eds, *Language Use and Linguistic Structure: Proceedings of the Olomouc Linguistics Colloquium 2016*. Palacký University, Olomouc, pp. 19–36.