Hybrid Agreement

Modelling variation, hierarchy effects and ϕ-feature mismatches

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Zorica Puškar

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Gutachter:
JunProf. Dr. Sandhya Sundaresan
Institut für Linguistik, Universität Leipzig
Prof. Dr. Andrew Nevins
Linguistics Department, University College London

IGRA Committee:

JunProf. Dr. Sandhya Sundaresan
Institut für Linguistik, Universität Leipzig

PD Dr. Martin Salzmann
Institut für Linguistik, Universität Leipzig

Dr. Petr Biskup
Institut für Slavistik, Universität Leipzig

Prof. Dr. Gerhild Zybatow
Institut für Slavistik, Universität Leipzig

Abstract and outline

This thesis explores the nature and functioning of agreement as a syntactic phenomenon through investigating and modelling its unexpected and non-canonical manifestations. Agreement is a grammatical phenomenon of a considerable theoretical interest as it reveals a great deal about the way in which syntactic objects interact and share morphosyntactic information. The kind of information that this thesis will be concerned with are ϕ-features (gender, number and person). Such features can be strictly *formal*, such as grammatical gender, which is an inherent arbitrary property of a noun. They may also be based on particular properties of the category that the nominal refers to (e.g. animate, human, female), in which case they are *semantic*. In the default state of affairs, a noun has only formal or only semantic features, but even if it has both, the two usually match in value. The main object of the study in this thesis are nominals known as *hybrid nouns*, whose formal and semantic features may differ in their values, which may in turn lead to conflicting representations on the elements that agree with them (adjectives, verbs, etc.). The syntactic theory that accounts for their behaviour must be permissive enough to explain how alternations between formal and semantic agreement come about, but also restrictive enough to make the resulting patterns respect universal crosslinguistic tendencies, defined in terms of agreement hierarchies.

I will begin by investigating particular patterns of hybrid agreement in Bosnian/Croatian/Serbian (henceforth: BCS), which are problematic for recent theories since the variation in agreement that they trigger is limited only to particular contexts. Part I will present the empirical focus of the dissertation, as well as develop a general account that derives the patterns of the interesting BCS hybrid nouns, but which also has wider empirical implications. Part II will explore these implications in deriving the effects of the Agreement Hierarchy, a crosslinguistic tendency that pertains to asymmetries among different types of agreement targets, while Part III will do the same for the Predicate Hierarchy, another crosslinguistic tendency concerned with agreement asymmetries among different types of predicates.

In Part I, Section 1.1 begins with one of the central puzzles of the dissertation, the so-called *split hybrid nouns* (Corbett 2015), nouns that control agreement with their semantic masculine gender features in the singular (1a), whereas in the plural they mostly control feminine agreement (with their grammatical gender) (1b), even though masculine is also possible (1c).

(1) a. Star-**i** vladik-**a** me je juče posetio.
old-M.SG bishop-M.SG me is yesterday visit.PRT.M.SG
'The old bishop visited me yesterday.'

b. Star-**e** vladik-**e** su se posvađal-**e**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL
'Old bishops had an argument.'

c. %Star-**i** vladik-**e** su se posvađal-**i**.
old-M.PL bishop-PL are REFL argue.PRT-M.PL
'Old bishops had an argument.'

Section 1.2 presents the main theoretical assumptions that my analytical model uses as ingredients to develop an analysis of the optionality between the semantic and grammatical gender agreement in the plural illustrated in (1b-c). The proposal focuses on: (i) the internal structure of the noun phrase in BCS, i.e. what lexical and functional items participate in building up a nominal category (Section 1.2.1); (ii) the internal structure of morphosyntactic ϕ-features, as basic properties of nouns (Section 1.2.2.1); (iii) the Agree operations that enable different probes to copy these features (Section 1.2.2).

The proposal for the internal structure of the nominal phrase combines insights from Distributed Morphology that morphosyntactic gender and number features do not exist on lexical items in the Lexicon, but they are actually introduced to nouns during syntactic structure building. Under the view that a noun consists of a root that is void of any features and a functional head *n* that turns this root into a noun, I follow Kramer (2015*a*) in assuming that this nominalizer *n* hosts natural gender and number features.

Since hybrid nouns trigger mixed agreement patterns, I follow previous accounts which propose that hybrid nouns contain two different gender features (Wechsler and Zlatić 2003; Pesetsky 2013; Landau 2016; Smith 2017). An innovation in my analysis in comparison to others is the proposal that grammatical gender is introduced in the structure later (and higher) than the natural gender. 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. I further propose that morphosyntactic number features are located between the natural and the grammatical gender, on the projection labelled as Num(ber) P(hrase) (Picallo 1991; Bernstein 1993; Harbour 2008).

Furthermore, in order to account for the internal structure of the morphosyntactic features, I follow previous accounts which claim that person, number and gender are complex features, consisting of smaller units organised into a hierarchy (Harley and Ritter 2002). Feature hierarchies have been discussed for person and number, but what is novel about my account is that I extend this idea to gender features. I propose that semantic gender is a complex feature, which contains gender and animacy features together, while grammatical gender is a simple feature, with only the gender value, but without animacy.

With the structural assumptions in place, I turn to the mechanics of the operation Agree (Chomsky 2001) to explain how agreement with gender features functions. For this purpose,

I utilize the Relativized Probing approach (Béjar 2003; Béjar and Řezáč 2009). My proposal is that agreement targets (verbs, adjectives) prefer to agree with natural (semantic) gender features, if such features are present on a noun. More concretely, this means that Agree will prefer to copy the natural gender features from the *n*P. If a noun does not have semantic gender, the agreement target will copy the grammatical gender features from the GenP as a last resort operation. Regular nouns have only one type of gender, thus Agree will copy the only gender it finds. With hybrid nouns, both types of gender can in principle participate in agreement, which is important for explaining how optionality arises. Such ideas were previously applied to person and number agreement, but this is the first account in minimalist terms that successfully extends the previous accounts to gender agreement.

The final ingredient to the analysis, and the place where interactions of grammatical building blocks play a crucial role is the ordering of agreement operations. More specifically, it concerns the order in which gender and number features are copied to the agreement target. I assume that gender and number features are copied onto targets (adjectives, verbs) by means of two independent Agree operations. The idea is that an agreement probe can perform these two operations in any order, but the order that applies in a derivation will have certain consequences. If gender agreement applies first, the probe (the verb or the adjective) will be able to copy the lower and more complex natural gender. If number agreement applies first, the following operation will have less freedom in applying since it will not be able to target any phrases c-commanded by the previously targeted head, Num, which contributed its features in the previous agreement step. This is due to the locality restriction on Agree, the *Condition on Agree Domains*, whose consequences will be explored throughout the dissertation.

The second part of the dissertation presents a case study in mixed agreement patterns and a demonstration of how the proposed analysis derives the possibility of different agreement on two different agreement targets. If two targets agree with a single hybrid noun, it can happen that one of them shows formal, while the other one shows semantic agreement. Yet, of the four logical possibilities in agreement with adjectives and verbs, the one in which the verb agrees in formal features after the adjective has agreed in semantic features (2b) is impossible:

(2) a. Star-**e** vladik-**e** su se posvađal-**e**/posvađal-**i**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Old bishops had an argument.'

b. %Star-**i** vladik-**e** su se posvađal-**i**/*posvađal-**e**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Old bishops had an argument.'

Such asymmetries were described in terms of a crosslinguistic tendency named Agreement Hierarchy by Corbett (1979), who noted that with respect to the possibility of showing semantic agreement, different agreement targets align as follows: ATTRIBUTIVE > PREDICATE > RELATIVE PRONOUN > PERSONAL PRONOUN, where the elements to the right are more likely to show semantic agreement. Moreover, once an element in the hierarchy agrees in semantic

features, all the other elements to the right of it, which agree with the same hybrid controller, must show semantic agreement as well. More crosslinguistic instances of such patterns can be found in Chapter 2.

Agreement restrictions that follow from Agreement Hierarchy have already been tackled in the accounts of Wechsler and Zlatić (2003); Pesetsky (2013); Landau (2016); Smith (2017); Wurmbrand (2017), all of which have certain problems when faced with BCS split hybrid nouns, as discussed in detail in Section 3.4. On the other hand, the analysis developed in this thesis, apart from capturing the BCS data, is able to account for all the data in these accounts.

The proposal for deriving the effects of the Agreement Hierarchy can be found in Section 3.1. The restrictions of the Agreement Hierarchy are derived essentially as a consequence of applying the mechanism of Agree to all the agreement targets in the same way, paired with an auxiliary assumption that once an element has copied ϕ-features from a goal, it itself can act as a goal for further Agree operations from higher syntactic heads. For instance, the adjective can agree with either the natural or grammatical gender of the noun in the way described above. If the adjective agrees with the natural gender of the noun, it will copy the value of the more complex natural gender feature. Any later probe, under whatever order of operations will only be able to target this feature because it is a) more complex and preferred, b) higher in the structure. This means in turn that formal agreement is not possible on later targets once the adjective has agreed in semantic features, since the semantic features on this adjective will always be the most available ones.

An important consequence of the account is that it is also able to capture mismatches in the same slot of the Agreement Hierarchy (e.g. between multiple nominal modifiers), as discussed in Section 3.2. The analysis will have the welcome consequence of treating adjectival and verbal agreement as the same process, essentially carried out by the same mechanism of Agree. Its crosslinguistic consequences and the extent to which the proposed system is able to model parametric variation in agreement between different languages will be discussed in Chapter 4.

Part III presents another case study in mixed agreement patterns, the Predicate Hierarchy. Agreement mismatches with nominals hybrid in number reveal that various types of predicates differ with respect to the degree of semantic agreement they are willing to show, forming the following implicational hierarchy, as formulated by Corbett (1983, 2006): FINITE VERB > PARTICIPLE > ADJECTIVE > NOUN.

The hybrid agreement controller that the effects of the Predicate Hierarchy will be demonstrated by is the second person honorific pronoun in various languages (mostly from the Indo-European family) collected by Comrie (1975); Corbett (1983); Wechsler (2011), outlined in Section 5.1. This pronoun has grammatically specified 2nd person and plural number features. However, different predicates in different languages may allow singular agreement (when addressing a single person) and, if required, gender agreement. For instance, in Czech, the finite verb shows the formal second person plural agreement (i.e. copies the features from the pro-

noun), while the participle, predicate adjective and predicate noun show singular and gender-dependent agreement (i.e. express the semantic features of the referent) (3a). In BCS, on the other hand, the participle and the predicate adjective show formal plural agreement (3b) (although in some varieties singular agreement is also possible).

(3) a. Vy **jste** byl-**a** dobr-**á**.
you.2.PL aux.2.PL been-F.SG good-F.SG
'You (single female addressee) were good.' [Czech] (Comrie 1975:408)

b. Vi **ste** bil-**i** veoma ljubazn-**i**.
you.2.PL aux.2.PL been-M.PL very kind-M.PL
'You (single female/male addressee) are very kind.' [BCS]

The data by Comrie (1975); Corbett (1983); Wechsler (2011) reveal that croslinguistically the finite verb consistently shows formal agreement, while the predicate noun always matches in semantic features. The targets in between vary in the kind of agreement they show.

In order to account for the given patterns, in Chapter 6 I extend the previously developed theory in order to accommodate the structure and agreement properties of pronouns, as well as agreement in person features. I will propose that 1st and 2nd person pronouns encode only natural gender on the *n*P, but, unlike nouns, they lack the GenP. Instead, they project a PersP, which encodes their person features. As for number, just like with the gender features with hybrid nouns above, I propose that the honorific pronoun encodes two conflicting number features. The semantic singular number is encoded together with the natural gender, which makes the *n*P the locus of semantic features. On the other hand, the formal plural features are encoded on the NumP. Such a structure of the DP makes it possible to explain the cause of mixed agreement patterns triggered by the honorific pronoun.

Different patterns in agreement will then be derived by applying the Agree mechanism first on the DP level (Section 6.2), and then on the various types of predicates that interact with this DP (T in Section 6.3, participle in Section 6.4, predicate adjective in 6.5 and predicate noun in 6.6). What all the predicates have in common is that they carry out two separate Agree operations, but while the ordering of these operations is strict on T (number is always copied before person), on the participle and the predicate adjective it can vary, depending on a language.

Essentially, applying Agree for gender early both on the DP and on the participle and the adjective will yield semantic agreement by copying all the features from the lower levels of the DP and making them available for higher probes. Crucially, copying semantic gender will entail copying of semantic number since the two features are inseparably connected in a common geometry and the system disallows partial valuation. Conversely, applying Agree for number early on both levels will bleed semantic agreement by blocking the access to the lower semantic features of the pronoun by means of derivational constraints on Agree. Keeping the order of Agree strict throughout a language, or letting it vary across different predicates will allow modelling of parametric variation (discussed in Section 7.1).

What the Predicate Hierarchy and the Agreement Hierarchy then have in common is that patterns of agreement mostly depend on the result of agreement on the DP level. In this sense, D will determine the possible agreement options on the different predicate probes. However, while Agreement Hierarchy depended on the transfer of features from probe to probe, the probes that make up the Predicate Hierarchy themselves do not necessarily need to interact.
The theory of ϕ-agreement developed in the dissertation properly derives the empirical patterns. Moreover, and more importantly, it gives a new perspective to modelling mismatches in the grammar. The simple idea behind it is that a speaker has two choices, but they work at the expense of each other. If the speaker chooses to express the semantic features on the agreement target, this particular derivational choice may lead to derivational opacity by making the lower levels of the structure unavailable for agreement. Conversely, if the speaker decides to give primacy to copying the formal features, they might do so at the expense of semantic information.
Importantly, this analysis contributes yet undiscussed data which enable novel theoretical contribution to the Minimalist theories. The analysis sheds some light on the possible structure of the nominal phrase in BCS (a matter of ongoing research and theoretical debate), and beyond. It also extends the existing analyses of number and person features and agreement with them to the issues of gender features and agreement, helping to yield a unified theory of ϕ-feature agreement. Finally, it reveals more about the workings and the restrictions on the operation Agree and the influence of hierarchical structure on this operation.

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This whole thing was supposed to be a squib. Yet, as every new question kept being answered with a new question, the squib turned into a paper, and the paper turned into a dissertation. It was just very difficult not to keep probing into the essence of these questions with all the support and encouragement I received from my committee from day one.

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Abbreviations and glossing conventions

Abbreviations

γ	gender feature
π	person feature
ϕ	phi-features
#	number feature
CAD	Condition on Agree Domains
CFV	Condition on Full Valuation
Gen	gender
Num	number
Part	participle
Pers	person
Pred	predication

Glosses

1	1st person
2	2nd person
3	3rd person
1,9	class 1 and 9 in Bantu
ACC	accusative
ADJ	adjective
ANIM	animate
AUX	auxiliary verb
CLIT	clitic
DAT	dative
F	feminine
CL	clitic
FUT	future
GEN	genitive
INS	instrumental
LF	long form (Russian adjectives)
M	masculine
N	neuter
NOM	nominative
OBJ	object
PL	plural
POLITE	the form for polite address
PRT	participle
PST	past
PRES	present
REFL	reflexive
SG	singular
SF	short form (Russian adjectives)

Part I

A new approach to hybrid agreement

Chapter 1

The overview of the proposal

1.1 The empirical scope: Challenges of hybrid agreement

Agreement as a grammatical phenomenon reveals a great deal about the way in which syntactic objects interact and share morphosyntactic information with one another. The kind of information that this thesis will be concerned with are ϕ-features. Such features can be strictly formal, such as grammatical gender, which is assigned arbitrarily to a nominal category and constitutes an inseparable part of it. If these features participate in agreement, we speak of *formal agreement*. The features may also be based on particular semantic properties of the category that the nominal refers to (e.g. animate, human, female, male), and agreement with such features is *semantic*. In the default state of affairs, a nominal category has only formal or only semantic features, but even if it has both, the two usually match in value (e.g. the noun *majka* 'mother' in BCS has the semantic feminine gender since it denotes a female referent, but it also has grammatical feminine gender like all the nouns ending in *-a*). Some of these features can thus be read off the noun's form (as is the case in most Slavic languages), or they are revealed when the noun enters an agreement relation with an agreement target (e.g. we only find out that *Tisch* 'table' in German is masculine after seeing that it appears with the masculine determiner *der*).

Agreement with such well-behaving nouns only demonstrates that *agreement targets* (elements that inherently lack ϕ-features, such as adjectives and verbs) must somehow be able to copy the morphosyntactic features from the *agreement controllers* (elements whose inherent ϕ-features control the type of agreement that the targets will show), but what allows for obtaining much deeper insights into the workings of agreement are the controllers with which the parallelism between formal and semantic features breaks down. For instance, the information that appears on the verb usually faithfully reflects the features that can be seen from the noun's form. But if the noun contains different formal and semantic features, the verb can sometimes also show the information that does not match the noun's form, but which instead matches its semantic features. This is where hybrid agreement patterns occur, examples of

which we will see throughout this dissertation.

Hybrid or mixed agreement patterns pose several challenges for the current syntactic theory: (i) rethink how to represent the morphosyntactic features on agreement controllers (ii) explain how agreement targets are capable of copying either formal or semantic features of the controller and (iii) detect a difference in the syntactic behaviour between different types of agreement targets, which would otherwise remain concealed if all the formal features of the nominal category matched all its semantic features.

1.1.1 Puzzle 1: Split hybrid nouns

The main empirical puzzle I begin my exploration with is posed by the so-called *split hybrid nouns* (Corbett 2015) in BCS.[1] Split hybrid nouns include nouns such as *vladika* 'bishop', *vojvoda* 'duke', *gazda* 'landlord', *starešina* 'head, senior', *drvodelja* 'carpenter', *bekrija* 'tippler', *kolega* 'colleague', *komšija* 'neighbor', *kafedžija* 'café-owner', *tata* 'dad', *deda* 'grandfather', among others (Stanojčić and Popović 1992:288,Stevanović 1989:130ff.). As they denote human animate male referents, such nouns bear natural masculine gender in BCS. But they have a curious property – they show additional gender variation along the number divide. For this particular group of nouns, this has the effect that in the singular, they always trigger masculine agreement – straightforwardly reflecting the natural gender on the noun (4a) – but in the plural, they can trigger either feminine (grammatical gender) agreement, as in (4b), or masculine, as illustrated in (4c).[2]

(4) a. Star-**i** vladik-**a** me je juče posetio.
old-M.SG bishop-M.SG me is yesterday visit.PRT.M.SG
'The old bishop visited me yesterday.'

b. Star-**e** vladik-**e** su se posvađal-**e**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL
'Old bishops had an argument.'

c. %Star-**i** vladik-**e** su se posvađal-**i**.[3]
old-M.PL bishop-PL are REFL argue.PRT-M.PL
'Old bishops had an argument.'

[1] These nouns are termed 'split hybrid nouns' since they trigger hybrid, or mixed, agreement patterns only in the plural, but in the singular, they always trigger masculine natural gender agreement. They 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, i.e. nouns whose natural gender depends on the gender of the discourse referent.

[2] Throughout the thesis, if not otherwise indicated, the examples come from BCS. If the relevant sources are not indicated next to them, the examples were constructed based on the author's native speaker intuition, confirmed by other native speakers of different varieties of the language.

[3] 32 native speakers of BCS were asked to provide their judgements on the pattern in (4c) (as well as similar patterns with split hybrid nouns, see the following section for further detail) by rating it on a scale of 1 to 7, 7 being the highest mark. 21.8% of the speakers found the example grammatical (rating it with a 4 and up), while others found it ungrammatical (rating it below 3). This preliminary survey indicates a noteworthy amount of inter-speaker variation in this respect, which in turn strongly urges further experimental testing of the grammaticality of such examples.

These patterns raise important empirical and theoretical questions such as what enforces the obligatoriness of natural gender agreement in the singular, while allowing for alternations 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. Specifically, patterns in (4) indicate that both natural and grammatical gender features can be present on a single noun simultaneously. The challenge is then to explain where and how formal and semantic features are encoded on nouns. Moreover, agreement mechanisms seem to be able to operate on both kinds of features. Thus, e.g. in (4), gender features on nouns must be sufficiently similar in structure in order for Agree to recognise them. However, they 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 number information on the noun. The goal of this thesis is to tackle these issues by investigating the complex interplay of number and gender agreement in BCS and beyond.

Hybrid agreement patterns in BCS have not gone unnoticed even in traditional grammars (Stanojčić and Popović 1992; Stevanović 1989), as well as in some recent work, for instance Corbett (2010, 2015). However, the formal literature on agreement in BCS so far (Corbett 2010; Wechsler and Zlatić 2000, 2003; Alsina and Arsenijević 2012*b*,*a*; Arsenijević and Gračanin-Yuksek 2016; Despić 2017) has not provided an explanation in terms of a concrete agreement mechanism that consistently derives the desired patterns. For instance, the theory of Wechsler and Zlatić (2003) does not allow adjectives to agree in natural gender in the plural. Moreover, this account treats natural gender agreement in the plural only as a dialectal option, making it difficult to constrain natural gender agreement in a systematic way. On the other hand, Despić (2017) focuses more on adjectives and does not offer a full account of the interactions between adjectival and verbal agreement, while Arsenijević and Gračanin-Yuksek (2016) face a similar problem since the main topic they address is hybrid agreement on relative pronouns.

As for the recent general accounts on hybrid agreement, the BCS split hybrid nouns pose the problem of limiting optionality only to the plural environment. Most theories assume that the natural gender is optionally introduced on the noun in a higher hierarchical position than the grammatical gender (and thereby introduce a 'gender switch') (Pesetsky 2013; Landau 2016). Such theories would have to assume that natural gender is optionally introduced on the noun in the plural, which would not straightforwardly extend to BCS since there is evidence that the natural gender is not optional (at least not with the split-hybrid nouns in (4)). Other theories that rely on the interpretabilty of features (e.g. Bošković 2009*b*; Smith 2017; Wurmbrand 2017) would have to assume that both interpretable (natural) and uninterpretable (grammatical) gender are present on the noun, but the interpretable gender may be optionally made invisible for Agree by feature deactivation. However, a possible deactivation only in the plural in BCS does not lend itself to a principled technical implementation. The aim of this thesis is to overcome such problems by introducing a novel theory of agreement

that derives the BCS data, as well as the patterns noted in the literature crosslinguistically, by a combination of the following factors: (i) the feature-geometric structure of the ϕ-features involved in agreement, which will enable modelling natural gender as a more complex feature than the grammatical one (ii) the articulated nature of the ϕ-probe (relativized probing), which will enable modelling natural gender agreement in terms of preference of the probe to agree in the more complex features, and (iii) the variable order of agreement operations, which will enable deriving the optionality between formal and semantic agreement.

1.1.2 Puzzle 2: Agreement Hierarchy

Upon a careful and detailed study of formal and semantic agreement patterns in different languages, Corbett (1979) concluded that agreement targets can be organised in an implicational hierarchy with respect to the possibility of showing formal or semantic agreement:

(5) *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 (that is, with no intervening decrease).' (Corbett 1979:204, Corbett 2006:207)

Corbett's Agreement Hierarchy essentially deals with two separate, but nevertheless tightly connected issues. I will refer to the first one as **Agreement Restrictions**, i.e. monotonicity, which essentially means that once an element on the hierarchy shows semantic agreement, all other elements to the right on the hierarchy must also show semantic agreement. The second aspect is the **Distance Principle** (cf. Corbett 1983, 1991, 2006, Landau 2016:1004), i.e. the observation that semantic agreement tends to appear more readily on elements that are more linearly distant to the controller (e.g. relative pronouns or verbs are more likely to show natural gender agreement than nominal modifiers).

Monotonicity in variation between formal and semantic agreement can be well illustrated by agreement with BCS split hybrid nouns. As (6a) shows, in case of variation between adjectival and verbal agreement, if the adjective shows grammatical gender agreement, the participle can still optionally show either grammatical or natural gender. However, as we can see in (5b), once the adjective shows natural gender agreement, the predicate must do the same.

(6) a. Star-**e** vladik-**e** su se posvađal-**e**/posvađal-**i**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Old bishops had an argument.'

b. %Star-**i** vladik-**e** su se posvađal-**i**/*posvađal-**e**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Old bishops had an argument.'

The patterns in (6) were confirmed in a preliminary consultation with a total of 165 native speakers of BCS with 20 hybrid nouns of the same type, including *kafedžije* 'café owners', *vojvode* 'dukes', *mašinovođe* 'engine drivers', *dede* 'grandfathers', etc. The speakers were asked to rate the examples on a 7-point scale, 7 being the highest possible grade. As mentioned in footnote 3 above, a great deal of variation in the acceptance of masculine agreement was attested among the speakers consulted, some finding it completely acceptable, others less so. In the concrete case of (6), masculine agreement on both the adjective and the participle (6b) was rated above 4 by 7/32 informants. However, natural gender agreement only on the participle, as in (6a) was much more acceptable across different split hybrid nouns and different speakers overall (with an average grade around 3 and up), which indicates that natural gender agreement is more acceptable on the verb than on the adjective in general in this language. Examples with natural masculine gender agreement on the adjective and grammatical feminine on the verb were by far the worst rated ones (with an average below 2), as predicted by the Agreement Hierarchy. This points to the fundamental importance of conducting further experimental research in order to verify the robustness of the natural agreement patterns in the spoken production of native speakers, the level of acceptance/grammaticality of such examples, as well as the reasons why some agreement targets are more permissible towards natural gender agreement than others.

Furthermore, restrictions seem to hold not only across, but also within the particular 'slots' in the Agreement Hierarchy. For instance, stacked adjectives in Russian can show either formal (masculine) or semantic (feminine) gender agreement (as in (7)), with the requirement that once the adjective closest to the noun has shown semantic agreement, all the others further away from it must show semantic agreement as well.

(7) a. ?U menja očen' interesn-**aja** nov-**yj** vrač.
by me very interesting-F.SG new-M.SG doctor
'I have a very interesting new (female) doctor.'

b. *U menja očen' interesn-**yj** nov-**aja** vrač.
by me very interesting-M.SG new-F.SG doctor
'I have a very interesting new (female) doctor.' (Pesetsky 2013:38)

Similar mismatches within a single slot in the hierarchy were noted in Hebrew (Landau 2016:1005) and Chichewa (Corbett 1991:239) and they will be closely inspected in Part 2. What all these mismatches have in common is the fact that if an element that is merged early in the derivation (e.g. an adjective) shows semantic agreement, the elements merged later (i.e. higher adjectives, the verb) must show semantic agreement as well. I take this to indicate that the agreement targets must communicate with each other in the course of the derivation such that agreement in semantic features on the earlier merged elements will restrict the kind of features that the later merged targets can access. The account that I propose will derive the Agreement Hierarchy effects by applying the agreement mechanism developed in Section 1.2 universally to all agreement targets. If Agree applies at nominal modifiers first, its outcome

will determine the agreement on the subsequently merged probe (another modifier, or a verb). Crucially, once an element has copied semantic features from the noun, this value is the closest one for any subsequent probe. The combination of the structural height of the gender feature and its complexity will force all subsequent probes to agree in this semantic feature, thus ruling out the formal agreement on them.

The other aspect of the Agreement Hierarchy consists in the fact that not all probes in all languages allow for mixed agreement patterns. Some are restricted such that attributive modifiers never agree in semantic features, while verbs do (e.g. English in (8)), or they only allow semantic agreement on the far-right end, on the personal pronoun, such as German in (9).

(8) a. This / *these committee sat late.
b. The committee has / have decided. (Corbett 1979:203)

(9) a. Das Mädchen, das/*die ich gesehen habe...
the.N.SG girl.N.SG that.N.SG/that.F.SG I seen have
'The girl that I saw...' (Corbett 1979:205)
b. Das Mädchen geniesst seinen/ihren Urlaub.
the.N.SG girl.N.SG enjoys its.N.SG/her.F.SG vacation
'The girl is enjoying her vacation.' (Wurmbrand 2017:20)

Thus the additional task of a successful agreement theory is to explain the sources of this interesting parametric variation across different languages, and within a single one. In my account, this variation will be reduced to the kind of features an agreement target prefers to agree with. Using the relativized probing approach will enable us to model the preference of certain probes for formal and/or semantic features.

1.1.3 Puzzle 3: Predicate Hierarchy

With respect to the possibility of showing formal or semantic agreement with hybrid controllers, the elements that typically belong to the 'predicate' slot in the Agreement Hierarchy have been proven to align according to the following implicational hierarchy:

(10) *The Predicate Hierarchy*:
FINITE VERB > PARTICIPLE > ADJECTIVE > NOUN
'For any controller that permits alternative agreements, as we move rightwards along the Predicate Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically (that is, with no intervening decrease).'
(Corbett 1983:43ff., Corbett 2006:231)

According to Corbett (2006), the Predicate Hierarchy, first recorded and defined by Comrie (1975), was in fact the precedent and inspiration for the study and postulation of the Agreement Hierarchy. The hybrid controller that Comrie (1975) first based his observations on was the pronoun for polite address, or the honorific pronoun. In languages such as Slavic, some

from the Romance family (French, Italian, Romanian), as well as Modern Greek, the second person plural pronoun is used when politely addressing a single person. Some of the predicates in these languages, such as finite verbs, always show plural agreement, i.e. they agree with the *grammatical* features of the second person *plural* pronoun. However, other predicates, such as participles and adjectives, can show either plural agreement, consistent with the finite verbs and auxiliaries, or they can show an interesting behaviour – *singular* agreement and agreement in the *natural gender* of the referent, which constitutes an instance of purely *semantic* agreement (since the gender and singular number are not encoded in the morphology of the pronoun).

Slavic languages are especially convenient for studying these patterns because of the great degree of variation in agreement that they show. Most Slavic languages use the second person plural pronoun *Vy* for polite address. This pronoun has grammatically specified second person and plural number features. However, different predicates in different languages may allow singular agreement (when addressing an atomic individual) and, if required, gender agreement. For instance, in Czech, the finite verb shows [π:2, #:pl] agreement, while the participle, adjective and noun show [#:sg] and gender-dependent agreement:

(11) a. Vy **jste** byl-**a** dobr-**á** / *byl-**y** dobr-**é**.
you AUX.2.PL been-F.SG good-F.SG / been-F.PL good-F.PL
'You (female addressee) were good.'

b. Vy **jste** byl-**a** učitelk-**a** / *byl-**y** učitelk-**y**.
you AUX.2.PL been-F.SG teacher-F.SG / been-F.PL teacher-F.PL
'You (female addressee) were a teacher.' [Czech]

(Comrie 1975:408, Petr Biskup, p.c.)

BCS instantiates a language where predicates mostly prefer formal agreement.[4]

(12) a. Vi ste bil-**i** pospan-**i**.
you.2.PL AUX.2.PL been-M.PL sleepy-M.PL
'You (feminine addressee) were sleepy.'

b. #Vi ste bil-**a** pospan-**a**.
you.2.PL AUX.2.PL been-F.SG sleepy-F.SG
'You (feminine addressee) were sleepy.'

Some other languages, such as Bulgarian, Macedonian and Slovenian optionally allow formal or semantic agreement on some, or all of their predicates.

The basic questions that the data above pose for the theory of agreement are (i) whether grammatical (and/or natural) gender are encoded on pronouns, and if the answer is yes, how exactly are they encoded if they are not visible in the pronouns' morphology? (ii) Furthermore,

[4] Since BCS is one of the languages under closer scrutiny throughout this work, and notorious for its variation in the possible agreement patterns (see, for instance, Willer-Gold et al. 2016 for some aspects of this variation), it is worth noting that previous literature, especially the works by Comrie (1975); Stevanović (1989); Corbett (1983); Despić (2017) admit that semantic agreement on participles and adjectives is possible in this language as well, although it is not the one that is preferred by the speakers.

if gender features do in fact exist on pronouns, does this mean that in languages with semantic agreement patterns these are natural gender features, but in languages with consistent formal agreement the honorific pronoun carries inherent grammatical masculine gender and plural number? Or is the masculine feature the result of default agreement? (iii) Finally, what principles of agreement force natural gender and number agreement on participles and adjectives in languages like Czech, while allowing for variation in the languages of Bulgarian and Macedonian type? I will argue that these questions can be answered by proposing that the honorific pronoun does encode semantic gender and number features, but whether they are going to be targeted by a particular probe depends on the order in which its Agree operations apply.

1.2 A new approach to hybrid agreement

In the sections to follow, we will first establish the general theoretical framework in which the analysis of mixed agreement patterns is couched. The main empirical puzzle at hand involves three complementary issues: (i) How is a noun able to bear only grammatical or only natural gender in some cases and both genders in others? (ii) How is the probe able to distinguish between the two types of gender? (iii) How should the systematic connection between gender and number agreement be derived such that gender alternations are made dependent on the number specification of the noun? Focusing on the agreement patterns of split hybrid nouns mentioned above, in this chapter I offer a proposal on where and how 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.

1.2.1 The Structure of DP in BCS

In this section I propose a structural representation of the nominal phrase in BCS, starting with a proposal for the loci of gender features.[5] I model the encoding of gender features on nouns 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 follow Kihm (2005); Lowenstamm (2008); Acquaviva (2009); Kramer (2015*a*) in treating gender as a morphosyntactic feature located on the functional head *n* which merges with a category-free root. What the present approach additionally utilizes as a locus for gender features is the functional projection Gen(der)P (Bernstein 1993; Picallo 2008), which formalizes the idea that in BCS a noun can simultaneously contain two distinct gender fea-

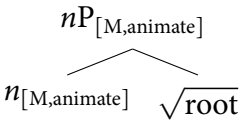
[5] I follow Progovac (1998); Caruso (2012); Stanković (2014) in treating the BCS nominal phrase as a DP even though it is a language without articles (contra Bošković 2008). This assumption, however, is not crucial in any way and the analysis could be transposed into a system without the DP layer, under the assumption that each nominal modifier is a probe and individually carries out the agreement operations usually attributed to D.

tures (see Pesetsky 2013 and in particular Steriopolo and Wiltschko 2010; Matushansky 2013; Landau 2016 for similar proposals on possible positions of two gender features in Russian). I argue that the difference in hierarchical position of gender features is, in part, responsible for regulating the distinction between grammatical and natural gender patterns in verbal agreement.

1.2.1.1 Natural gender on nouns

In a mixed gender assignment system, such as the one present in BCS (cf. Corbett 1991:34), natural gender is assigned to animate nouns in accordance with the natural gender of the referent ('semantic assignment', Corbett 1991:8). I follow Kramer (2015*a*) in assuming that natural gender is a feature borne by the nominalizing head *n*. The nominalizer combines with a root to derive a noun and if, for instance, it bears masculine gender feature, the resulting noun will bear natural masculine gender.

(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 features [Masculine, animate] (henceforth [M,anim]), the second, n_f, has a gender feature [F,anim], and the third, $n_\varnothing$, has no gender features. A noun created by a nominalizer that carries both gender and animacy features is interpreted as having natural gender (see Section 1.2.2 below for a more elaborate implementation of this assumption under the Harley and Ritter (2002) feature geometry approach to ϕ-feature structure). On the other hand, inanimate nouns will not contain the gender feature on *n* at all and their grammatical gender will be specified without the animacy value, on a different functional projection (see Section 1.2.1.2). Example (14) illustrates how these nominalizers build nouns with natural masculine (14a), natural feminine (14b) and nouns without natural (with only grammatical) gender (14c).[6]

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

This approach has the advantage of explaining how a particular root can derive nouns with

[6] Having three different nominalizers also corresponds to saying that there is only one *n* categorising head that generally builds nouns, but it can be specified with three different kinds of features. Thus, we can think of these two options as notational variants.

different features and avoids postulating multiple homonymous occurrences of the same noun in the lexicon. For instance, BCS contains nouns whose gender can vary based on the gender of the referent, such as $\sqrt{\text{budal-}}$ 'fool'. Under the current proposal it can be assumed that roots of such nouns can be optionally licensed under n_m, n_f or $n_\varnothing$, where the final nominalizer derives nouns with only the designated grammatical[7] gender. Depending on the nominalizer the roots merge with, they will receive appropriate interpretation, yielding nouns with natural masculine, natural feminine or grammatical feminine gender, respectively:

(15) a. n_m + $\sqrt{\text{budal-}}$ 'fool'... → natural masculine ('a male fool')
b. n_f + $\sqrt{\text{budal-}}$ 'fool'... → natural feminine ('a female fool')
c. $n_\varnothing$ + $\sqrt{\text{budal-}}$ 'fool'... → grammatical feminine ('a fool; gender irrelevant')

I follow Acquaviva (2009, 2014) and Kramer (2009, 2015*a*) who propose that a language has a limited number of nominalizers. Each nominalizer can freely merge with roots and the possible combinations of nominalizers and corresponding roots are regulated by licensing conditions. The way that this could potentially be formalised is to assume that a certain root can only be pronounced if it is found in the context of a particular *n*, otherwise it cannot be spelled out. Kramer (2015*a*:50ff.) proposes that semantic licensing conditions 'are encoded in the Encyclopedia as conditions on the semantic interpretation of a root in a context' (Kramer 2015*a*:51). On this view, roots freely combine with different nominalizers in syntax and the combinations are licensed at LF. On the morphological side, the combinations of roots with nominalizers (with particular features) trigger the insertion of appropriate vocabulary items (Kramer 2015*a*:52). In her view, this allows us to maintain one of the core DM assumptions, that roots contain no formal features (even though such assumptions require a less restrictive syntax).[8][9]

[7] See Section 1.2.1.2 for the specification of grammatical gender on a noun.

[8] One could potentially argue against treating the root as being void of any formal features. Since roots relate to concepts, they should arguably have certain semantic features, which is particularly apparent in nouns like 'woman', 'mother', etc., so one might claim that it should not be the case that all gender features come only after the root is merged with *n*. Regarding this problem, I follow Kramer (2015*a*:52), who explicitly argues against the option of having semantic features on the root paired with formal gender features on *n* already in narrow syntax, arguing that this would simply mean extending the lexicalist approach to gender encoding. 'Licensing a root in a particular nominal context is what makes it be interpreted as male or female; there is no inherent male-ness or female-ness to the roots themselves (this approach has the added benefit of keeping the roots free from features that are associated with particular categories, like gender)'(Kramer 2015*a*:52). I therefore follow Kramer in assuming that roots are not inherently male or female, but that interpretation of a root in a particular context is what makes it be interpreted as male or female.

[9] Keeping the root category-free however is not the crucial assumption as the same result in the analysis can be achieved even if an alternative approach is pursued, in which licensing of the combinations of roots and nominalizers could apply in narrow syntax (instead of LF). In that case, we would allow the roots to carry certain semantic features, which could 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 assume that the root phrase can carry certain inherent features. Under such an assumption, we can posit a variety of an Agree operation between *n* and the Root-P. This Agree operation would be carried out by *n*, whereby the natural gender feature of *n* would receive 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 low in the

1.2.1.2 Grammatical gender on nouns

Based on the evidence from hybrid gender agreement triggered by split hybrid nouns, we may conclude it is necessary to postulate two (sometimes different) gender features on the DP. While proposals along these lines have already been made in the literature, they either model the representation of features in a different framework (HPSG by Wechsler and Zlatić 2003), or base the distinction on feature interpretability without specifying their structural position (e.g. Smith 2015; Wurmbrand 2017), or assume a configuration that cannot derive the patterns from BCS (Landau 2016; Pesetsky 2013).[10] I propose that grammatical gender features are present on a functional projection I will label as GenP (Bernstein 1993; Picallo 2008). GenP is projected above the *n*P. The consequence of this 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.

Such an approach enables us to treat split hybrid nouns as nouns that simply have two different gender features. Nouns with natural masculine gender (such as *vladika* 'bishop') are derived with the nominalizer $n_{m[\text{M,anim}]}$. These nouns then have the [M,anim] specification on *n*P, signalling a natural gender feature. The [F] feature is specified on GenP, yielding the structure in (17). By extension, nouns with natural feminine gender (such as *majka* 'mother') are derived from the nominalizer $n_{f[\text{F,anim}]}$. 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 (18). These nouns do not have gender specified on the *n*P.[11] Such nouns then only have grammatical gender [F] on GenP.

structure, at the *n*P level, lower than grammatical gender, and determined or assigned first, before grammatical gender (cf. Corbett 1991; Wechsler and Zlatić 2003; Despić 2016.)

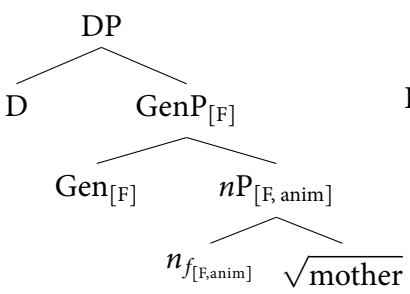
[10] I will postpone a more detailed critical evaluation of such proposals until Section 3.4 where the benefits of my account with respect to those cited here will be discussed.

[11] We could, theoretically, also take into account the fact that some nouns with grammatical feminine gender also have animacy features (e.g. for nouns like *roda* 'stork', denoting, for instance, animal species, or nouns such as *beba* 'baby' or *osoba* 'person'). For such nouns we could postulate an additional nominalizer $n_{a\varnothing[\text{anim}]}$. Nouns derived by this nominalizer would have animacy features on *n*P and grammatical feminine gender supplied at GenP, yielding the following structure:

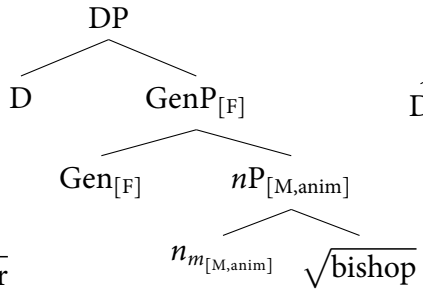
(i) $[_{\text{DP}}\ \text{D}\ [_{\text{GenP}_{[\text{F}]}}\ \text{Gen}_{[\text{gen:f}]}\ [_{n\text{P}_{[\text{anim}]}}\ n_{a\varnothing_{[\text{anim}]}}\ [\ \sqrt{\text{stork}}\ ]]]]$

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 animacy feature can, however, play a role in other grammatical processes, such as pragmatic agreement with co-referential pronouns, in which case it can contribute to triggering natural gender agreement. These processes will be left out of the discussion in this dissertation for the most part, since they do not involve strictly local operations on the level of a single clause.

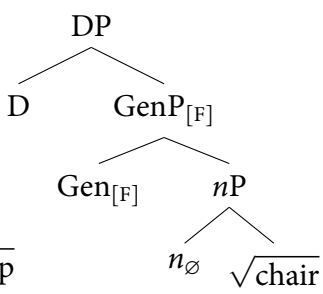
(16) Natural feminine



(17) Natural masculine

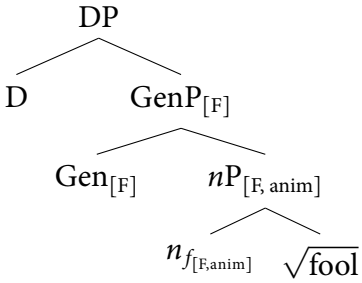


(18) Grammatical feminine

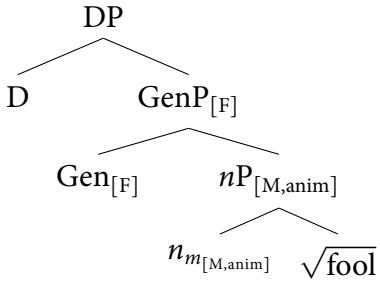


Finally, gender variable nouns like *budala* 'fool' (cf. (15) above) can be structured as either (19), (20), or (21) below, depending on the nominalizer the root is merged with, respectively yielding nouns with natural masculine or natural feminine gender, depending on the referent, or nouns with only grammatical feminine gender, in the cases where gender of the referent is truly unknown or irrelevant.

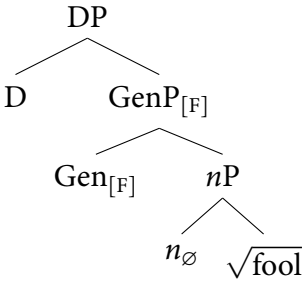
(19) Natural feminine



(20) Natural masculine



(21) Grammatical feminine



This approach will later offer a possibility to unify the treatment of gender features, by offering a locus for 'semantic' or 'interpretable' natural gender features, as opposed to 'formal' or grammatical features on higher functional projections.

1.2.1.3 An aside: The relationship between gender and declension class

Since grammatical gender and declension class show a strong correlation in BCS, it might be tempting to equate them and treat gender as an instance of class or vice versa. However, there is general consensus in the literature against such an approach. Declension class is usually defined as 'a set of lexemes whose members each select the same set of inflectional realisations.' (Aronoff 1994:64) On the other hand, according to Kramer (2015*a*:70), '[g]ender is (i) the sorting of nouns into two or more classes; (ii) depending on biological sex and/or animacy (at least for some nouns); (iii) as reflected by agreement patterns on other elements (e.g.

adjectives, determiners, verbs, auxiliaries, etc.).' Gender is thus a syntactic category, participating in agreement processes, while declension class is a purely morphological property of a lexeme, i.e. a property that determines a lexeme's morphological shape (see Aronoff 1994; Harris 1991; Wechsler and Zlatić 2003; Alexiadou 2004; Embick and Halle 2005; Alexiadou and Müller 2008 for different proposals and Kramer 2015*a*:233ff. for an overview). I will show that both are necessary in the description of the BCS nominal system, but there is a potential way to capture the dependency between them, such that declension class can be at least predicted, if not derived, from the gender specification of the noun in combination with the ending it takes in the nominative singular.

In BCS, as well as many other Slavic languages, the relationship between declension class and gender poses something of a chicken and egg problem. Some authors, e.g. Corbett (1991:34), Wechsler and Zlatić (2003), claim that gender is assigned according to declension class. Others argue that declension class is predictable from gender specification of the noun, as proposed by Crockett (1976:12) for Russian. Additionally, some authors postulate rules that apply in both directions (see Despić 2017) for BCS.[12] 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. I will mostly follow the final line of thinking, sketching briefly in this section how such an approach can be applied to the BCS nominal system.

The relationship between class and gender in BCS is not absolute. Knowing the declension class of a noun in BCS does not necessarily imply knowing its gender. BCS divides nouns into three declension classes (Mrazović and Vukadinović 1990). Nouns in declension class I are either masculine or neuter. They share a great part of the paradigm, but the differences between them lead me to split them into two subclasses. All nouns belonging to Class I_n are neuter, carrying the suffix *-o* or *-e*, while those belonging to I_m are masculine, ending in -∅. Class II hosts nouns ending in *-a*, which are mostly feminine (both animate and inanimate), but also include a group of animate masculine nouns. Class III nouns end in -∅ and almost all of them are feminine inanimate. Thus, Class II can host nouns of either masculine or feminine gender, while Class I needs to be split into two subclasses, and we cannot really predict which of the two the noun will have.

[12] Despić (2017) postulates three kinds of rules for gender/class feature assignment. Semantic assignment rules (ia) assign natural gender based on the gender of the referent, declension class rules (ib) assign gender based on the noun's declension class, while redundancy rules (ic) make sure that feminine nouns are classified into second declension, while neuter nouns belong to the first one.

a. Semantic assignment rules: female → [FEM], male → [MASC] null→ [NEUT]
b. Declension assignment rules: DC II → [FEM], DCIn → [NEUT]
c. Redundancy rule: [FEM] → DC II [NEUT] → DCIn

The downside of this approach is that in order to arrive at a functioning system of gender/class feature assignment, nouns of Class III have to be set aside.

DECLENSION CLASS	ENDING	GENDER
CLASS I_m	-∅	masculine
CLASS I_n	-*o* or -*e*	neuter
CLASS II	-*a*	feminine and masculine
CLASS III	-∅	feminine

Table 1.1: Declension class and gender

On the other hand, trying to predict declension class from gender causes a similar problem. 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.

GENDER	ENDING	DECLENSION CLASS
masculine	-∅ or -*a*	CLASS I_m or CLASS II
feminine	-*a* or -∅	CLASS II or CLASS III
neuter	-*o* or -*e*	CLASS I_n

Table 1.2: Gender and declension class

Moreover, Müller (2004); Alexiadou and Müller (2008) claim that inflection class cannot be predicted from gender, phonological or semantic properties of a noun. Gender cannot be a predictor as we have already seen in Table 1.2.1.3. Phonological properties are not a completely reliable diagnostic either, as in BCS nouns that end in -∅ may be masculine (and belong to Class I), or feminine (and belong to Class III). Semantic properties such as animacy are not a good predictor either, as all classes (except for Class III in BCS, which contains inanimate nouns for the most part) can include both animate and inanimate nouns alike. Müller (2004); Alexiadou and Müller (2008) thus conclude (focusing on Russian) that class features must be inherently present on the noun stem. However, if we actually combine all these elements – animacy (i.e. natural gender), grammatical gender and the noun's suffix – and then try to predict inflection class again, the results look much more promising and we get much closer to predicting what class a certain noun should belong to.

If we think of the 'natural gender' from Table 1.2.1.3 above as the gender introduced to the noun on *n*, grammatical gender as the one present at Gen and the 'ending' as a theme vowel (whose nature will be explained shortly below) 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.[13]

[13] Evidence for postulating a theme vowel in BCS comes from the forms of different nouns in oblique cases (dative, instrumental) in the plural, where a thematic vowel appears between the root and the inflectional ending (see e.g. Arsenijević 2016*a*; Bailyn and Nevins 2008). Inflectional morphology can thus only tell us that class features are closer to the root than other features (gender, number and case). BCS nouns still retain thematic vowels in oblique cases, e.g. in *stolov-i-ma* 'tables-th.vowel-dat.pl' vs. *stolic-a-ma* 'chairs-th.vowel-dat.pl', where the vowels *i* and *a* respectively are arguably theme vowels, stemming from the so-called *yer* sounds, which existed

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

Table 1.3: Predicting declension class from gender

One of the possible analytical options under the DM framework assumes that the form of the theme vowel is determined by the inflection class inherently present on the noun. Following Oltra-Massuet (1999); Oltra-Massuet and Arregi (2005); Embick and Halle (2005); Embick (2010); Embick and Noyer (2007) inflection class can be assumed to be present as a morphological feature on a dissociated Theme node. As summarised by Kramer (2015*a*:237), there are two stages in deriving inflection class under such an approach. First, a dissociated Theme node is post-syntactically adjoined to the categorising head at PF. By this we make sure that declension class does not play any role in syntax proper. Later in the process of Vocabulary Insertion, the Theme node is realised as a theme vowel. Under this approach, some authors (Oltra-Massuet 1999; Embick and Halle 2005) assume that declension class is present as a diacritic feature on the root. It does not play any role in narrow syntax, but at PF, after the Theme node is inserted, this node copies the class feature from the root. This is how declension class is still in some sense a lexical property of the noun, but is essentially important only for the post-syntactic processes. However, an objection raised by Kramer (2015*a*:238) is that this approach does not allow roots to be category-free.

In the concrete case of BCS nouns, we would say that the root of a noun such a Class II masculine noun as *vladika* 'bishop' has a diacritic II, and this is copied by the Theme node at PF. A Vocabulary Insertion rule would then afterwards make sure that the feature II is pronounced as *-a*. The benefit of this approach is that gender and declension class are kept completely separate, but a downside is that it becomes a completely arbitrary fact that, for instance, all nouns of grammatical masculine gender make up a single class.

An alternative analytical option is to derive inflection class based on the combination of natural gender, grammatical gender and the theme vowel. Similar proposals have been put forward by Halle and Matushansky (2006); Bailyn and Nevins (2008), who derive Russian inflection classes based on the combination of the stem and the theme suffix. Under this approach, in BCS *-e*/*-o*, *-a* and *-∅* would be treated as theme suffixes and each of them can be used as a

in earlier forms of Slavic, but disappeared completely or were altered by merging with other vowels (see Bailyn and Nevins 2008 for more detail and similar claims for Russian, as well as Halle and Matushansky 2006 for the same claim on adjectives in Russian). Following Bailyn and Nevins (2008), it could be assumed that theme vowels are inserted at the root node as a marker of declension class (as e.g. in Embick and Halle 2005), while the suffix *-ma* marks number and case in this example).

predictor 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 Class II masculine noun as *vladika* 'bishop', consisting of a root $\sqrt{\text{vladik-}}$, a natural masculine nominalizer n_{m} 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 important and more formal. A challenge at this point is that Halle and Matushansky (2006); Bailyn and Nevins (2008) do not explicitly specify how theme suffixes come about, i.e. at which point in the derivation they are added to the noun.[14] Since class and gender are not the central concern of my current proposal, the exact formalisation and a detailed discussion of a new proposal would take us too far afield. Thus, in conclusion, I simply note that the nominal structure I have proposed, apart from being able to capture syntactic agreement patterns, has the potential to explain facts about nominal morphology as well.

1.2.1.4 Number on nouns

I assume that number on nouns in BCS is specified within the DP on the NumP projection (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 the absence of number (see Nevins 2011*b*; Pesetsky 2013; Ackema and Neeleman 2015 for a similar claim on singular number, and in particular Despić 2017 for a claim that singular number is unmarked with respect to plural in Serbian), i.e. singular number is morphologically realised as a default exponent.[15] I further propose that NumP is projected above the *n*P. More

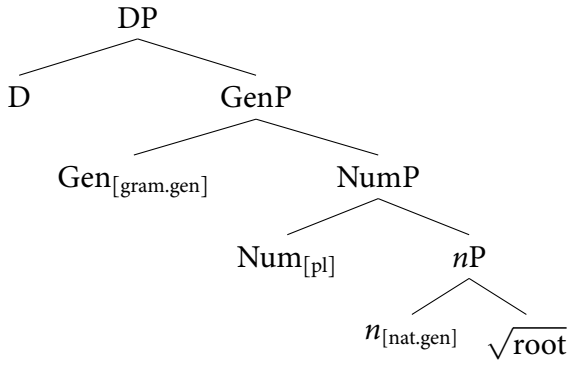
[14] Halle and Matushansky (2006:360) propose three possible hypotheses about what a theme suffix may be:

(i) a. Theme suffixes are category-changing suffixes (n, a, v, . . .). (They argue that this view cannot be maintained)
b. Theme suffixes are delimiters of a special kind that enable speakers to analyze a word into its main components and that appear between any two word-internal components. (cf. Oltra-Massuet 1999)
c. Theme suffixes allow Case marking and (partially) determine inflection class. On this view, Russian requires delimiters only between the stem and inflection (at least in the case of declension). If theme suffixes are absent, Case marking is impossible. This position can be viewed as a special case of hypothesis 2. Halle and Matushansky (2006:360)

[15] This only holds for BCS. Number marking on nouns might vary in different languages, and as we will see in Section 3.2.2, it seems that [#:sg] is also represented as a feature in the closely-related Russian. Moreover, the singular number feature will also be assumed for BCS in Part 3 where we will deal with the effects of the Predicate Hierarchy. However, this singular feature will be assumed to mark the 'natural number' or the real-life semantic number of the referent, as opposed to the number that appears in a noun's morphological marking.

precisely, I propose that NumP, when present, is projected between *n*P and GenP, as shown in (22). This will be shown to play a crucial role in capturing the influence of nominal number marking on gender agreement.

(22) Structure of DP in BCS



This structure in (22) additionally 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*a*). Grammatical gender, on the other hand, is a functional feature provided higher in the structure. 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. The only point where inflectional morphology does tell us something about the order of morphemes could be in oblique cases (dative, instrumental) in the plural, where a thematic vowel appears between the root and the inflectional ending, as discussed in the previous section (see e.g. Arsenijević 2016*a*; Bailyn and Nevins 2008). Inflectional morphology can thus only tell us that class features are closer to the root than other features (gender, number and case), but it does not tell us much beyond the fact that the heads that host them must somehow be fused.

Based on this point, we could also potentially assume that there is a single phrase, that for the clarity of description, we could call PhiP (following Déchaine and Wiltschko 2002), or AgrP (in the sense of Baker 2008). Such a phrase could contain grammatical gender and number features together (as proposed by Ritter 1993 for Romance).

(23) *Alternative structure*

$[_{\text{DP}}\ \text{D}\ [_{\text{PhiP}}\ \text{Phi}_{[\text{gramm.gen, pl}]}\ [_{n\text{P}}\ n_{[\text{nat.gen}]}\ \sqrt{\ldots}\ ]]]$

Nothing would go wrong in my proposal if such a structure is adopted, and indeed, nothing speaks against it when it comes to morphological realisation. However, I adopt the structural option of separate projections since it makes sense in the light of the Agree mechanism proposed below – if agreement for gender and number is carried out by two separate operations,

those two features may well be hosted by different projections. Therefore, I have adopted the notation with two different projections for expository, rather than explanatory adequacy.

1.2.2 The mechanics of Agree

Having laid out the proposal for the structure of DP, let us now turn to the assumptions about the internal structure of ϕ-features and the mechanism of Agree. I will account for the BCS gender agreement patterns by combining aspects of two formal models of feature structure and agreement. Using a feature-geometric gender system, I propose that natural and grammatical gender are internally distinguished, with the former being more complex than the latter. Subsequently, using the relativized probing model of Béjar (2003); Preminger (2014), I propose that the gender-probing head can be made sensitive to these structural differences between the two kinds of gender. Additionally, I treat gender and number agreement as distinct operations whose interactions, in combination with relativised probing, yield the given patterns.

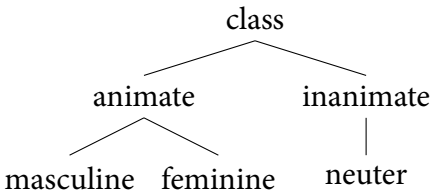
1.2.2.1 Feature geometric approach to ϕ-features

I adopt the *feature geometry* approach to ϕ-features, proposed originally by Harley and Ritter (2002) (see also McGinnis 2005; Béjar and Řezáč 2009; Georgi 2012, 2013; Nevins 2007; Preminger 2011, 2014 for various adaptations of this proposal). The underlying idea is that person, number and gender features are in a hierarchical entailment relationship with respect to one another. A certain type of feature increases in complexity or markedness depending on how many nodes in the hierarchy it contains.

Probably due to the fact that both *classifiers* and *gender* are ways of categorizing nouns across languages, Harley and Ritter (2002) seem to conflate them by proposing that 'class' and 'gender' belong to the same part of the hierarchy.[16] 'Class' in this hierarchy is, arguably, a cover term for both gender and class and Harley and Ritter (2002:514) indeed use the two terms interchangeably.

[16] See Dixon (1982); Corbett (1991); Aikhenvald (2000) for an extensive discussion on the differences between languages that have the so-called *gender systems* and *classifier systems* and how and why classifier and gender features differ from each other, but yet play a similar role in the grammar, most notably in agreement. The recent work of Corbett and Fedden (2016) however argues that gender is actually the canonical category of noun classification and all the other types of classifiers can be derived from this category. Such conclusions speak in favour of the Harley and Ritter (2002) conflation of class and gender, but they also justify saying that 'gender' indeed is a more general category and that 'class' is unnecessary in the hierarchy.

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



The gender and class feature hierarchy is not discussed in great detail and Harley and Ritter (2002:514) 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 such 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' is actually what is traditionally called 'gender' in BCS. I follow Corbett (1991:147ff.) in equating gender with *agreement class*, which encompasses a set of nouns that have the same feature structure and distribution and trigger the same 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.[17]

Furthermore, based on syncretisms in masculine inflectional paradigms and certain agreement properties, 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. 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 adjectives and demonstratives, possessives, etc. also changes depending on the animacy of the noun (cf. the demonstrative *ovaj* 'this' in (25)) (see Corbett 1991:162 and Blagus Bartolec 2006 and references therein).

(25)

	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

To illustrate, even though both nouns in (26) are masculine and in the accusative, their in-

[17] But see Arsenijević (2016*a*) for a claim that neuter gender in BCS is actually a grammaticalisation of a classifier system, and not a proper gender such as masculine or feminine.

flectional suffixes and the forms of the modifiers differ:

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

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

Moreover, even polysemous nouns take different suffix and modifier forms depending on whether they denote an animate or an inanimate referent in the given context. For instance, the noun *član* can mean either 'member' (animate) (27a), or 'article' (inanimate) (27b). The data here suggest that the specification of animacy together with gender on a noun can have an effect on nominal syncretism and the form of relative pronouns, as well as bringing about differences in meaning, as in (27).

(27) a. Dozvolite mi da vam predstavim **novog**/*novi član-**a**
allow me that you introduce new.ACC.M.SG/new.ACC.M.SG member
našeg društva **kojeg**/*koji sam nedavno upoznao.
our society who.ACC.M.SG/which.ACC.M.SG am recently met
'Allow me to introduce a new memeber of our society, whom I've recently met.'

b. Dozvolite mi da vam predstavim *novog/**novi** član-∅
allow me that you introduce new.ACC.M.SG/new.ACC.M.SG article
zakona *kojeg/**koji** smo nedavno usvojili.
of-law who.ACC.M.SG/which.ACC.M.SG are recently adopted
'Allow me to present the new article of the law, which we've recently adopted.'

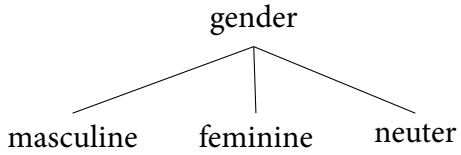
Facts like these lead Corbett to postulate that 'animate' and 'inanimate' are subgenders of the masculine gender in BCS. They are not proper genders, as their behavior is different only in certain, but not all, contexts (Corbett 1991:164).

The subgenders are therefore dependent on the masculine gender, so it is not the case that being animate entails being masculine in BCS (as suggested by the Harley and Ritter geometry), but rather the opposite holds. 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.' Moreover, animacy does not trigger agreement in and of itself, but it only affects agreement and inflectional morphology with nouns of certain gender, in BCS masculine. Therefore, animacy cannot be considered to be a feature completely independent of gender.

I therefore propose inverting the Harley and Ritter (2002) gender hierarchy such that all nominals in BCS contain the gender node, but those that have natural gender also contain the additional 'animate' node below it. The advantage of this way of modelling gender hierarchy is that differences between natural and grammatical gender fall out from their internal feature structures. In particular, natural gender is more complex than grammatical gender, since it

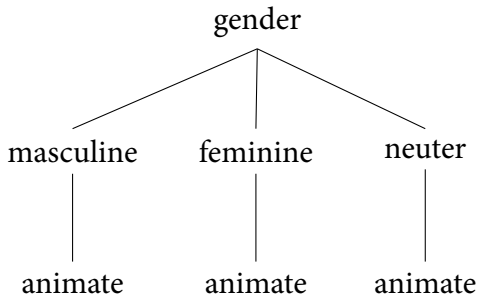
contains an animacy node in addition to a gender node. In the modified version of the Harley and Ritter (2002) hierarchy, I replace the *class* node with the general *gender* node. Gender can take three values – *masculine*, *feminine* and *neuter*:

(28) Modified hierarchy for gender (incomplete version)



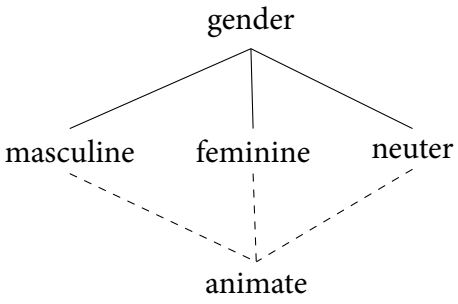
In order to accommodate the role of animacy in gender feature structure, I propose that all three gender features can contain an additional dependent *animate* node. The node 'animate' can therefore optionally appear below 'masculine' or 'feminine' or 'neuter'. In order to graphically represent this, we could assume that each gender node can optionally dominate the 'animate' node, as in (29):

(29) Modified hierarchy for gender (incomplete version)



However, a structure such as the one in (29) is suboptimal in that it needs to assume multiple instances of the 'animate' node. Multiple instances of animacy are unnecessary, as any noun with natural gender will in fact have either natural masculine or natural feminine, but having both of them (i.e. a noun that is simultaneously naturally masculine and naturally feminine) is impossible in the grammar of BCS. Therefore, I propose instead that animacy should be represented by a single node, but this node can be associated to any gender feature. We can think of it either as a dissociated node, or alternatively, a node that is simultaneously dominated by all gender features (i.e. a version or multidominance) (30). We can 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.

(30) Modified hierarchy for gender (final version)



The structure in (30) 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 to gender features 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 (30). Schematically, the two types of gender (ignoring neuter) will be represented as follows:

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

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

(33) Grammatical gender: $\begin{bmatrix} \text{F} \end{bmatrix} \begin{bmatrix} \text{M} \end{bmatrix}$

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.

1.2.2.2 Relativized probing

Relativized probing is the approach put forward in the work of Béjar (2003); Béjar and Řezáč (2009) and extended in Georgi (2012, 2013); Nevins (2007, 2011*b*); Preminger (2014); Deal (2015), among others, to model phenomena such as hierarchy effects in agreement, where probes seem to pick out, or show preference for a specifically defined type of features. I adopt this approach to account for the preference of the gender probe in BCS to target natural gender on nouns.

The core idea is that Agree (as defined in Chomsky 2000, 2001) is the operation which makes sure that the unvalued uninterpretable features of the probe are valued by matching features on the closest c-commanded goal in a local relationship. A very concise definition was offered by Baker (2008):

(34) F agrees with XP, XP a maximal projection, only if:

a. F c-commands XP or XP c-commands F (the c-command condition).

b. There is no YP such that YP comes between XP and F and YP has ϕ-features (the intervention condition).

c. F and XP are contained in all the same phases (the phase condition).

d. XP is made active for agreement by having an unchecked case feature. (Baker 2008:65)

Following Béjar (2003); Béjar and Řezáč (2009); Preminger (2014) in assuming that features can be represented with varying degrees of complexity (cf. Harley and Ritter 2002 feature hierarchy) both on the probe and on the goal, it is predicted that the probe can look for features of corresponding complexity on the goal and that those features need to be equally specified. In Béjar (2003), it is assumed 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. Béjar (2003) assumes further that in the second cycle the probe's features are simplified, with the result that it can now 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; Georgi 2012, 2013; Nevins 2007, 2011*b*; Preminger 2014). If the probe is specified in such a way that it can only be valued by a certain type of ϕ-feature, it is able to skip certain 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. In a situation where there are two DPs 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 its search domain 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 in its search domain, 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).

1.2.2.3 Relativized probing in gender agreement

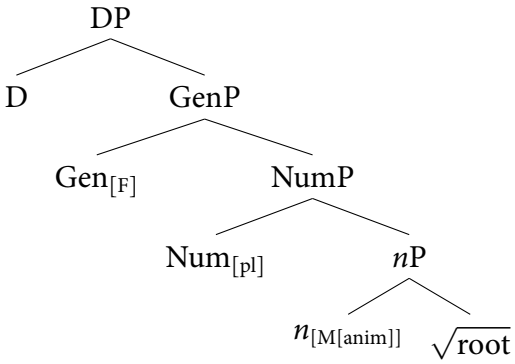
Bearing in mind the general properties of relativized probing and the gender feature structure proposed in (31)–(33), assume now that the gender probe can also vary in complexity, which means that it can seek to be valued by (or be relativized with respect to) features of different

complexity, for instance only natural, only grammatical, or either gender.[18] Assume further that in BCS, gender probe is always relativized towards natural gender, which can schematically be illustrated as in (35). I will use the notation [∗F:□∗] introduced in Heck and Müller (2007) to denote an unvalued probe feature, and from now on, I will formalise the notation for gender features by using the Greek letter γ 'gamma' (cf. Coon and Bale 2014), unifying it with already established symbols for ϕ features (in particular person π and number #).

(35) $\begin{bmatrix} * \ \gamma{:}\square * \\ *\text{anim}{:}\square * \end{bmatrix}$

Recall that nouns in BCS can have natural masculine, natural feminine, variable natural gender, or only grammatical gender. Let us take agreement with Class II nouns with natural masculine gender as an example, since those nouns can contain two different gender features. Assuming the structure in (17), repeated here in (36), their *n*P has the features [M[anim]], whereas the GenP has only [F].

(36) Structure of DP in BCS



I assume that matching followed by valuation of unvalued features is a necessary precondition for successful Agree to obtain. The probe is specified as [∗γ:□[anim:□]∗] (the bracketed notation is a shorthand for the hierarchically structured probe in (35)), and the *n*P has values for both features, while GenP has only one of them. Partial valuation is excluded by assumption; the probe prefers to wait and see if it can find all the features at once, rather than allow for partial valuation by the first feature it encounters. I propose the following formalisation of this condition:

(37) *Condition on Full Valuation*: Valuation is successful if and only if

a. the goal entails the features of the probe[19]

b. the full set of the goal's features is copied by the probe.

[18] 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.

[19] As a working definition of entailment, I adopt the Béjar and Řezáč (2009:43) formulation that 'a set con-

This condition can be thought of as a version of Chomsky's (2001:15) *Maximise Matching Effects* or Pesetsky's (1989) *Earliness Principle*, the idea behind which is that, if the probe and the goal match (and are active in their terms), the deletion of uniterpretable features has to apply as soon as possible. More importantly, according to Chomsky (2001:15) 'partial elimination of features under Match, followed by elimination of the residue under more remote Match, is not an option'. If we update this claim in terms of Agree that involves feature valuation, we may assume that partial valuation of the probe after matching only a subset of features, followed by valuation of its residue by another goal, is not possible. Concretely, a complex gender probe cannot copy the [F] feature from Gen first and copy [anim] from *n* subsequently, since copying only [F] would violate (37a), while copying only [anim] from *n* would violate (37b). Let us look at some sample derivations. Agreement in gender in the ideal case results in valuation of both the probe's features by *n*P rather than by GenP, as in (38)-(39). During the first cycle of Agree, the probe searches past GenP, even though it is the closer potential goal with a gender feature, because GenP does not contain all the features specified on the probe, but only a subset of them. 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. As shown in (40), valuation is carried out successfully at this point, so there is no need for the second cycle of Agree.

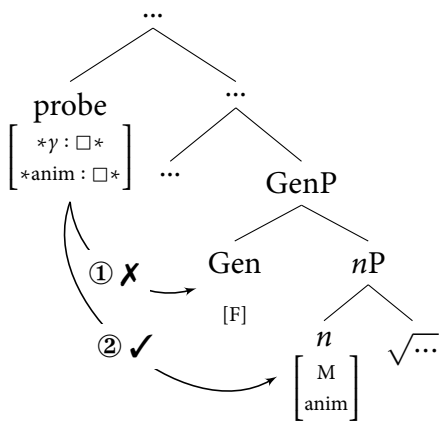
(38) Agree with GenP (no valuation):

PROBE	GOAL: GenP	AGREE
$*\gamma$:□$*$	[F]	✗
$*$anim:□$*$		

(39) Successful Agree for natural gender:

PROBE	GOAL: *n*P	AGREE
$*\gamma$:□$*$	[M]	✓
$*$anim:□$*$	[anim]	✓

(40)



If the probe does not find natural gender on *n*P for some reason (e.g. with nouns with only grammatical feminine gender), a new cycle of Agree is initiated. In the second cycle of Agree,

taining a feature (structure) [F] *entails* a feature (structure) [F′] if and only if [F′] is a subset (including identity) of the least set containing [F]'.

the probe's features are reduced up to the root node [∗γ:□∗] (see Béjar 2003:82 for an equivalent assumption on person), leading the probe to look only for gender features, disregarding animacy. As a consequence, GenP, as the closest goal with the corresponding feature, is able to value the probe's features on the second cycle, resulting in valuing the probe with a grammatical gender feature:

(41) Cycle 1: Agree with GenP (fail):

PROBE	GOAL: GenP	AGREE
∗γ:□∗	[F]	✗
∗anim:□∗		

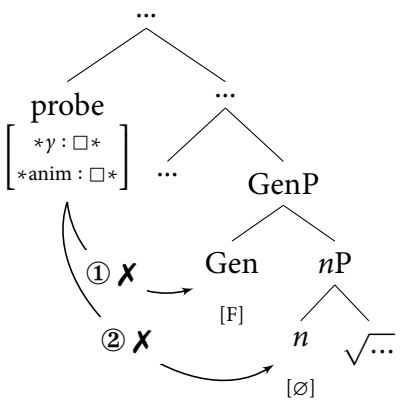
(42) Cycle 1: Agree with *n*P (fail):

PROBE	GOAL: *n*P	AGREE
∗γ:□∗	∅	✗
∗anim:□∗		✗

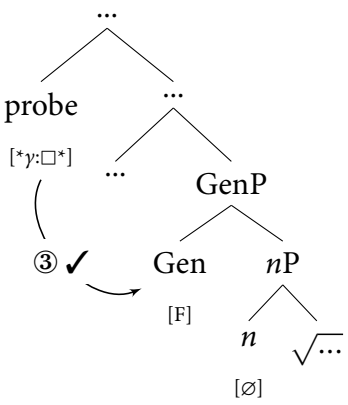
(43) Cycle 2: Agree with GenP (successful):

PROBE	GOAL: GenP	AGREE
∗γ:□∗	[F]	✓

(44) Cycle 1



(45) Cycle 2



Recall 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 (cf. the CFV in (37) above). 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 [∗γ:□∗] feature of the probe is valued by GenP, whereas [∗anim:□∗] is valued by *n*P. Valuation consists in copying the entire feature hierarchy fragment 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 between the probe and the goal.[20]

[20] There is one more remaining logical possibility mentioned and utilized by Béjar and Řezáč (2009), namely

1.2.2.4 Modelling 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; Chomsky 2000; Antón-Méndez, Nicol and Garrett 2002; Béjar 2003; Carstens 2003; Řezáč 2004; Marušič, Nevins and Badecker 2015; Preminger 2014 for various applications of this proposal and Bošković 2009*b* and Arsenijević and Mitić 2016 for BCS in particular). I follow Béjar and Řezáč (2009) in locating both number and gender probes on the same head. I assume that the order of application of Agree operations can be 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. This will have the cross-linguistic consequence in that languages can have either a strict or an underspecified order of operations on all or some probes, as elaborated in Part 3. BCS would be an instance of a language where probes seem to have a certain degree of freedom of ordering the two operations.

Focusing on gender and number and their interaction, I assume that the operation-triggering features are ordered on the probe and this order determines the feature discharge.[21] Thus in (46), gender agreement is carried out before number agreement as the gender feature is the first one on the stack to be discharged, whereas in (47) the order is reversed.

(46) Gender Agree > Number Agree

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

(47) Number Agree > Gender Agree

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

1.2.2.5 Condition on Agree Domains

Systematic restrictions on optionality in agreement, which we will get to know while discussing the Agreement Hierarchy and Predicate Hierarchy effects later on, indicate that multiple Agree operations with underspecified order of application do need to be constrained in some way. To this end, I introduce a novel constraint on Agree which will derive those restrictions as instances of derivational opacity.

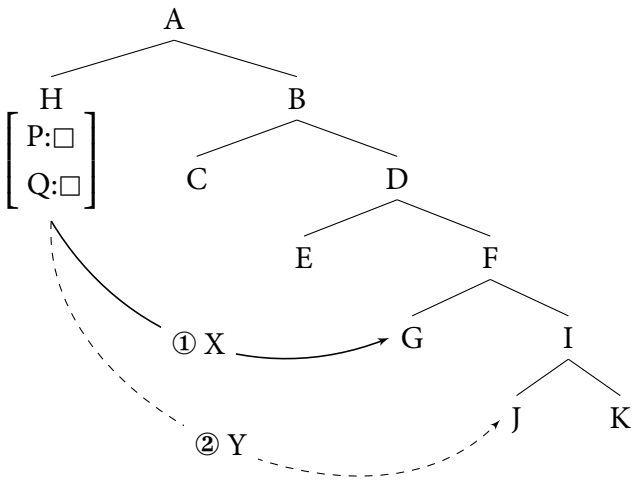
valuation by the goal which is more complex, i.e. has more features than the probe. In this case, the whole feature matrix from the goal is copied onto the probe, even though the probe is less specified. Such a scenario does not obtain in gender agreement in my system as laid out so far, but the valuation with an overspecified goal will be explored as an option in Part 3, where it will give correct results in deriving valuation of the probe by natural gender and number features simultaneously.

[21] I assume that all probes may carry these features, as long as they show reflections of gender and number agreement in general (adjectives, possessives, demonstratives, participles, relative pronouns). Probes such as auxiliary verbs, which do not show gender agreement in Slavic, by assumption do not have a gender probe, but instead have a number and a person probe.

I propose that if an Agree operation triggered by the first probe on a head has targeted a particular goal, the following Agree from the same head cannot target phrases lower in the structure than the goal targeted by the previous Agree. In other words, by agreeing with a particular goal, an Agree operation establishes a domain for application of further Agree operations from the same head. I propose the following formalisation of this condition:

(48) *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.

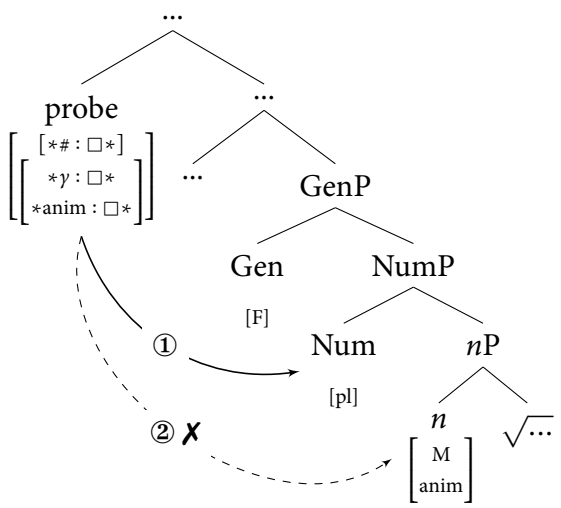
(49)



Consider an illustration, presented in (50).[22] Let Number Agree be X and Gender Agree be Y. In the order where 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.

[22] The 'probe' in (50) is intended to be neutral for the purpose of illustration of an abstract example and is therefore not defined with a particular label. As we will see in the later chapters, the probe can be either an adjective, a determiner or another nominal modifier, as well as the verbal participle, which makes the analysis of Agree universally applicable.

(50)



As seen in (50), the CAD produces an opacity effect – if the 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. (47)), gender Agree will not be able to target *n*P because number Agree will have rendered all the phrases it c-commands opaque for this probe.

Note that I depart from the definition of Agree as proposed by Chomsky (2000, 2001) presented in (34) above, in assuming that a syntactic head, rather than its maximal projection acts as a goal for Agree. This in turn calls for defining the CAD in terms of c-command, rather than dominance. More specifically, if we were to say that the second Agree operation cannot target any XP dominated by the already targeted XP, we would predict that everything below the XP level is inaccessible for Agree, which would include both the specifier and the complement of the goal phrase. However, there is empirical evidence to suggest that elements below the XP level are in fact available for Agree in BCS. For instance, in agreement with conjoined noun phrases in BCS, the verbal probe is able to agree either with the coordination as a whole (showing 'resolved agreement' in default masculine plural features) or only with the first conjunct.[23]

(51) a. Na stolu su stajali / **stajala** [$_{\&P}$ **pisma** i koverte].
on desk are stood.M.PL / stood.M.PL letter.N.PL and envelope.F.PL
'Letters and envelopes were on the desk.'

b. [$_{\&P}$ **Pisma** i koverte] su stajali / **stajala** na stolu.
letter.N.PL and envelope.F.PL are stood.M.PL / stood.N.PL on desk
'Letters and envelopes were on the desk.'

[23] See Bošković (2009*b*); Marušič et al. (2015), Willer-Gold et al. (2016), Murphy and Puškar (to appear) among others, for further detail on all the possible patterns of conjunct agreement and possible analyses.

There is a general consensus in the literature on coordination to treat the &P as an asymmetric structure, where one conjunct is merged as the complement and the other one as the specifier of the &-head.[24] Moreover, most of the literature on conjunct agreement agrees that the default or resolved agreement is the result of agreement with the conjunction phrase &P which has (or has not) computed features of its NPs (Bošković 2009*b*; Bhatt and Walkow 2013; Marušič et al. 2015; Willer-Gold et al. 2016; Murphy and Puškar to appear). However, agreement with the first conjunct indicates that Agree need not necessarily target the &P node, but can in fact look below it and target the specifier of the &P. Therefore, the specifier position seems to be independently available for Agree operations.[25]

In general terms, 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 and target the structure that is not lower than the goal that was targeted by the first Agree operation. That is, the first Agree does what is best and it is allowed to seek for its most appropriate possible goal as far in its c-command domain as possible. The following Agree, however, cannot search even further than the first one, it must be as economical as it can and converge with whatever it manages to find (or simply fail, see the next section for an elaboration of this assumption). The CAD can thus 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). These principles 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.

The idea of Agree interacting with phase opacity is not unprecedented in the literature. In fact, it might seem that my proposal on Agree leading to opacity is incompatible with the proposal of Rackowski and Richards (2005) that Agree actually 'opens a phase', since a phrase that has been agreed with becomes transparent for extraction. However, the two proposals are essentially concerned with two different things. First, my proposal concerns two Agree operations, as opposed to Agree and Move, discussed by Rackowski and Richards (2005). Moreover, in BCS nothing prevents extraction out of an NP that has been agreed with, regardless of whether the natural or grammatical gender participated in Agree. In (52), the noun *mušterija* 'customer' has grammatical feminine gender, but its natural gender can vary depending on the discourse referent. If the referent is male, masculine natural gender agreement is possible

[24] See Munn (1993); Larson (1990); Zoerner (1995); Johannessen (1998); Weisser (2015) for further details and arguments.

[25] The option of 'looking inside' the &P in order to agree with the highest NP was adopted by Bošković (2009*b*); Marušič et al. (2015); Murphy and Puškar (to appear). However van Koppen (2005, 2008) proposes that the &P and the first conjunct NP in its specifier position are actually equidistant and both can be targeted by Agree in the syntax. However, if such an analysis of equidistance is on the right track, it would have to be assumed that Agree then does not target heads, but only XPs, and the CAD would correspondingly have to be defined in terms of dominance instead of c-command.

with nouns of this type. In (52a), the adjective *starog* 'old.m.acc' has agreed in natural gender features, which under out analysis means that the *n*P has been targeted by an Agree operation. Yet, it is possible to extract the complement of the noun to the sentence-initial position, which indicates that the domain of the *n* is still available for extraction (assuming that movement applies after agreement). In (52b), the adjective *staru* 'old.f.acc' agrees in feminine gender, which means that Agree has targeted the Gen head. However, extraction of the noun's complement is nevertheless possible, even though the Agree operation that targeted Gen has triggered a CAD effect.

(52) a. ?Kog pekara$_i$ si sreo [$_{DP}$ starog mušteriju t$_i$]?
which.GEN baker.GEN are met old.M.SG customer
'Which old baker did you meet a customer of?'

b. ?Kog pekara$_i$ si sreo [$_{DP}$ staru mušteriju t$_i$]?
which.GEN baker.GEN are met old.F.SG customer
'Which baker did you meet an old customer of?'

We can therefore still safely assume that a phrase that has been agreed with is transparent for movement, but this still does not mean that this phrase is necessarily transparent for further Agree. All this indicates that grammatical and natural gender agreement are processes different than movement, and probably independent from it. However, nothing in principle prevents Agree operations to interact amongst themselves in opaque ways.

Moreover, note that the CAD does not assume 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). What we are dealing with instead is a restriction on the domains of the operation Agree itself, which is independent of the properties, or activity, of ϕ-features on a noun. The CAD is thus a condition on probes, not goals (cf. Keine 2016). Consequently, nothing prevents a feature targeted by an Agree operation from one head to be targeted again by another Agree from the same, or from a different head, provided that the Condition on Agree Domains in (48) is obeyed. For instance, a gender feature of *n* or Gen which is targeted by an Agree operation from an adjective can later be targeted by an Agree operation from a participial head, once this head is merged in the structure. We will explore a full range of possible combinations and their outcomes in the chapters to follow.

At last, the CAD may produce and effect equivalent to the Phase Impenetrability Condition since it makes the c-command domain of a particular syntactic head opaque for subsequent syntactic Agree operations. By the CAD, however, the domain of the phase only becomes opaque after being affected by a syntactic operation, while the PIC assumes that a certain head is a phase by virtue of a category it bears. Therefore, the CAD is similar to the PIC since it leads to derivational opacity. However, it still differs from the PIC in its dynamics, as the CAD domains can be re-defined with respect to a particular probing head.

1.2.2.6 Failed agreement and default valuation

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), and his precedents Schütze (1999:479) and Béjar (2003:78), in claiming that if there is a probe whose presence requires initiating an Agree operation, that Agree operation can fail. Agree is obligatory in the sense that it needs to be carried out under appropriate circumstances once it is triggered, but it can apply vacuously if it does not find an appropriate goal. In the case at hand, if the [∗#:□∗] probe does not find a phrase that contains number features, since it cannot be further diminished and trigger second-cycle Agree, the number value for the probe will be supplied as singular by inserting a default marker in the morphology.[26]

1.3 Deriving mixed agreement patterns

With the theoretical assumptions in place, in this section we address one of the central puzzles in gender agreement in BCS, mentioned in Section 1.1.1. A certain type of BCS nouns, termed *split hybrid nouns* (Corbett 2015), show curious agreement patterns. While in the singular they always trigger agreement according to their natural gender (masculine) (53a), in the plural their agreement can vary between natural (masculine) gender and grammatical (feminine) gender (53b).

(53) a. Vladik-**a** je juče stiga-**o**/*stigl-**a**.
bishop-M.SG is yesterday arrive.PRT-M.SG/arrive.PRT-F.SG
'The bishop arrived yesterday.'

[26] 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. In this case, masculine is inserted as the default gender value. However, another potential candidate for what may look like failed agreement is the neuter singular agreement in impersonals and *weather*-verbs, as in (i)–(iii) (adapted from Franks 1995:293):

(i) Hladno je.
cold.N.SG is.3.SG
'(It) is cold'

(ii) Trebalo je da...
needed.N.SG is.3.SG that
'(It) was necessary that ...'

(iii) Činilo se da...
seemed.N.SG refl that
'(It) seemed that . . . "

However, as Murphy and Puškar (to appear) argue, neuter value in impersonal sentences without an overt subject is agreement with a silent expletive, rather than the result of default valuation due to failed agreement (Franks 1995:113). As for the featural specification of this expletive, various authors have proposed that it has only number features, or deictic features, and they may or may not have case features (see Svenonius 2002:8). Murphy and Puškar (to appear) therefore assume the impersonal expletives to be instances of *pro*-drop in BSC, following the arguments laid out for Russian and Polish by Perlmutter and Moore (2002); Perlmutter (2007); Legate (2014). This expletive *pro* carries 3rd person singular neuter features (Franks 1995:113, Svenonius 2002:8, Perlmutter 2007:285 and Legate 2014:98).

b. Vladik-**e** su juče stigl-**e**/stigl-**i**.
bishop-M.PL are yesterday arrive.PRT-F.PL/arrive.PRT-M.PL
'Bishops arrived yesterday.'

Before proceeding, let us briefly summarise the basic facts about the structure of split hybrid nouns. These nouns have feminine grammatical gender. However, since they denote animate male referents, their natural gender is masculine. Following the assumptions on gender features outlined above, the split hybrid nouns then have natural masculine gender [M[anim]] on *n*P and grammatical feminine gender on GenP, as in (54):

(54) $[_{\text{DP}}\ \text{D}\ [_{\text{GenP}}\ \text{Gen}_{[\text{F}]}\ [_{\text{NumP}}\ \text{Num}_{[\#:\text{pl}]}\ [_{n\text{P}}\ n_{m[\text{M[anim]}]}\ \sqrt{\text{bishop}}\ ]]]]$

Moreover, the NumP is projected between the two gender features only if it carries a plural feature, otherwise it is absent. In the sections to follow, I will show in detail how the assumptions outlined above conspire to derive the alternations only in the plural, while showing that the obligatoriness of natural gender in the singular is a direct result of the system.

1.3.1 Deriving agreement in natural gender

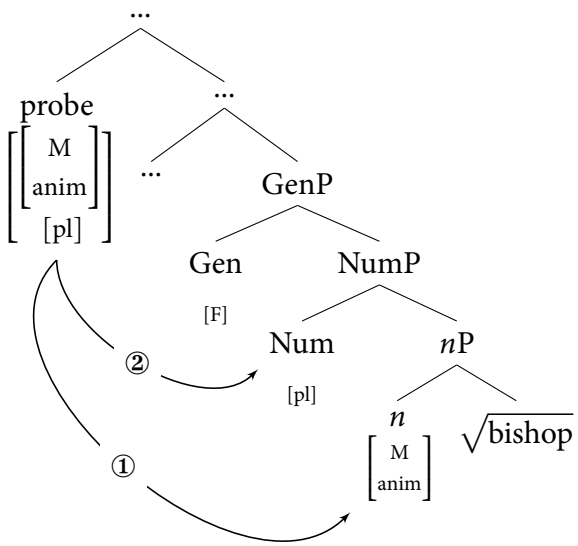
In order to successfully derive the puzzle in (54), the theory of agreement developed here must be able to explain why alternations between natural and grammatical gender with split hybrid nouns can occur only in the plural. In this section I show that the order in which Agree operations apply has a 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 blocking or bleeding agreement with natural gender, forcing instead the grammatical gender valuation:

(55) a. Gender Agree > Number Agree → natural gender agreement
b. Number Agree > Gender Agree → grammatical gender agreement

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 as [F], reflecting the grammatical gender. The order in which Gender Agree precedes Number Agree can be formalized such that $[*\gamma{:}\square[\text{anim}{:}\square]*]$ probe is discharged before the $[*\#{:}\square*]$ 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 on the probe:

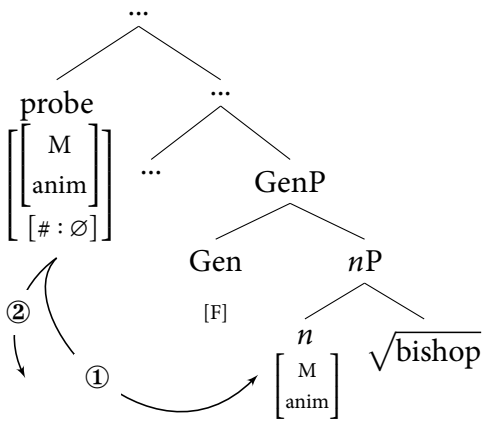
(56) Vladik-**e** su juče stigl-**i**.
bishop-M.PL are yesterday arrive.PRT-M.PL
'Bishops arrived yesterday.'

(57) **Natural gender agreement:** [∗γ:□[anim:□]∗] > [∗#:□∗]



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

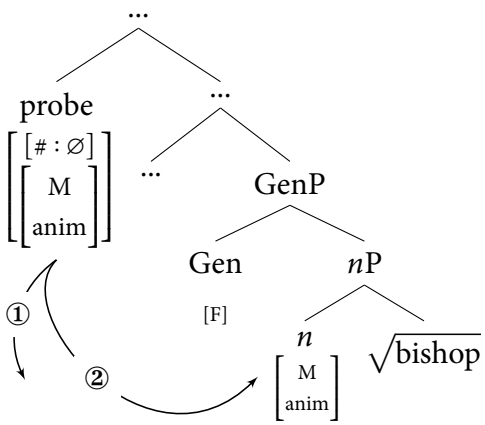
(58) Singular agreement: [∗γ:□[anim:□]∗] > [∗#:□∗]



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 intervener to gender agreement. This is the desired result since, as we have seen, such nouns invariably trigger natural masculine agreement in the singular. This is confirmed by the opposite order of operations. Since NumP is not projected in the singular, the [∗#:□∗] probe, when discharged, will not find a corresponding valued feature on DP. This Agree operation fails and the unvalued number feature is valued as singular by default. None of the phrases within DP is affected by Number Agree, so the subsequent gender probe can

reach *n*P and the natural masculine gender feature on it.

(59) Singular agreement: [∗*γ*:□[anim:□]∗] ≻ [∗#:□∗]



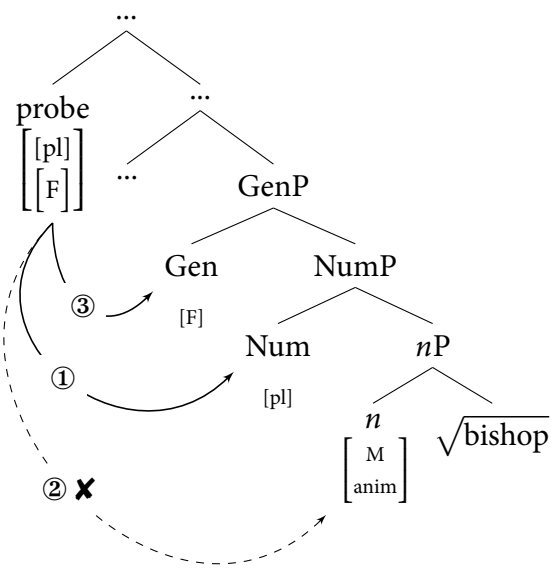
The derivation in (59) will thus have the same result as the one in (58), with the only difference being the order of probing. This ensures that the gender probe will always be valued by natural gender in the singular, where it is assumed that there is no NumP to act as intervener to gender agreement with the *n*P.

1.3.2 Deriving agreement in grammatical gender

Consider now how the reverse order of application of the two operations yields grammatical feminine agreement in the plural. Ordering the number probe before the gender probe leads to targeting the NumP first, valuing the probe as plural. Respecting the *Condition on Agree Domains* (48), gender probe cannot target any phrases lower than NumP in the structure, so the only option will be to agree with GenP and value the probe with grammatical feminine gender.

(60) Vladik-**e** su juče stigl-**e**.
bishop-M.PL are yesterday arrive.PRT-F.PL
'Bishops arrived yesterday.'

(61) **Grammatical gender agreement:** [∗#:□∗] > [∗γ:□[anim:□]∗]



As (61) shows, after discharging the [∗#:□∗] probe, any subsequent Agree operation cannot to apply to a phrase below the 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 [∗γ:□∗] feature. Such a feature is accessible on GenP, which provides the probe with the grammatical feminine value.

This mechanism of gender agreement illustrates the Relativized Minimality (Rizzi 1990) effects in relativized probing for gender (which were 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 mechanism above shows that variation between natural and grammatical gender agreement can be captured through intervention effects by number agreement operations, which can be derived from independent theoretical assumptions, i.e. as a result of a conspiracy of relativized probing, separate probing for number and gender and the Condition on Agree Domains.

To sum up, the alternation in gender agreement with this group of nouns provides evidence that Number Agree and Gender Agree can be modelled as interacting 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.

Part II

Deriving Agreement Hierarchy effects

Chapter 2

The Agreement Hierarchy puzzle

This part of the dissertation explores what agreement targets have in common, but also what properties make them different from each other, as well as what syntactic mechanisms enable agreement targets to copy ϕ-features from agreement controllers. The idea is simple: all agreement targets agree in fundamentally the same way, but what produces the surface differences between them is the kinds of features they are looking for in order to fulfil their well-formedness requirements, and the availability of those features on agreement controllers. The novel part from the theoretical side will be the proposal that apart from copying ϕ-features from agreement controllers, agreement targets can copy ϕ-features from each other.
Upon a careful and detailed study of formal and semantic agreement patterns on different agreement targets, Corbett (1979) concluded that agreement targets can be organised in an implicational hierarchy with respect to the possibility of showing formal or semantic agreement:

(62) *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 (that is, with no intervening decrease).' (Corbett 1979:204, Corbett 2006:207)

The evidence for the existence of the hierarchy comes from a number of well-known examples of agreement with nouns with mismatching semantic and formal features. For instance, the German noun *Mädchen* 'girl' is a noun of grammatical neuter gender, but since it refers to a female person, it is also assigned natural feminine gender. Elements from the 'attributive' slot in the hierarchy (determiners and adjectives) show neuter agreement with this noun, while the predicate in German shows no gender agreement, which obliterates the effects of the hierarchy. However, there is a clear difference between the relative pronoun and the personal pronoun – while the former always shows grammatical gender agreement (63), the latter can optionally agree either with the grammatical neuter or the natural feminine gender (64):

(63) a. Das Mädchen, das ich gesehen habe...
the.N.SG girl.N.SG that.N.SG I seen have
'The girl that I saw...' (Corbett 1979:205)

b. *Das Mädchen, die ich gesehen habe...
the.N.SG girl.F.SG that.N.SG I seen have
'The girl that I saw...'

(64) a. Das Mädchen geniesst seinen Urlaub.
the.N.SG girl.N.SG enjoys its.N.SG vacation
'The girl is enjoying her vacation.'

b. Das Mädchen geniesst ihren Urlaub.
the.N.SG girl.N.SG enjoys her.F.SG vacation
'The girl is enjoying her vacation.' (Wurmbrand 2017:20)

The German noun *Mädchen* illustrates therefore a hierarchy in agreement targets which has a strict cut-off point between the relative pronoun and personal pronoun slots. The elements before this point all show grammatical agreement, whereas the elements after it show agreement in natural gender (i.e. semantic) agreement.

(65) ATTRIBUTIVE > PREDICATE > RELATIVE PRONOUN || PERSONAL PRONOUN

Another well known example of a hybrid agreement pattern comes from the English *committee*-type nouns. Such nouns, which are formally singular, but semantically mark a plurality of referents, trigger formal singular agreement on attributive elements (66a), while on predicates (66b) and coreferent pronouns (66c)-(66d) (in some dialects of English) they allow for variation between semantic and grammatical number agreement:

(66) a. This / *these committee sat late.
b. The committee has / have decided. (Corbett 1979:203)
c. The government is embarrassing itself with this strategy.
d. The government are embarrassing themselves with constant scandals.
(Smith 2017)

These examples indicate that the cut-off point for this type of nouns in English may be between the attributive and the predicate slots, illustrating again that semantic agreement is more probable at the rightward end of the hierarchy, while the leftward end is reserved for grammatical agreement. This is taken to mean that, while languages may parametrically vary in where the cut-off point between formal and semantic agreement will be, the hierarchy itself is grammatically universal.

(67) ATTRIBUTIVE || PREDICATE > RELATIVE PRONOUN > PERSONAL PRONOUN

Another important point that the English hybrid nouns can illustrate is monotonicity. Semantic agreement, even though optionally available, if it appears on a certain target, it imposes

restrictions on targets to the right of the hierarchy. Thus, if the predicate shows semantic agreement, all the elements to the right of it (co-referential pronouns in this case) must show semantic agreement, too. Corbett (1991:226) therefore claims that the possibility of semantic agreement increases monotonically 'with no intervening decrease'. In (68a) the verb agrees in formal singular feature of the hybrid noun while the co-referential pronoun is still allowed to show semantic plural agreement. However, if the verb, i.e. the predicate, shows semantic plural agreement, the pronoun must agree in semantic features as well, the return to formal agreement is impossible.

(68) a. The government is embarrassing themselves day after day.
b. *The government are embarrassing itself day after day. (Smith 2017)

More liberal, but also more nuanced, instances of hybrid agreement patterns that confirm the existence of the Agreement Hierarchy come from Slavic languages and nouns which are hybrid in gender. Such nouns can bear both grammatical and natural gender simultaneously and both of them can be reflected in agreement on different targets. Split hybrid nouns such as *vladika* 'bishop' in BCS, which agree in natural masculine gender in the singular, present a particularly interesting case since in the plural they can trigger either natural masculine or grammatical feminine gender agreement. Unlike *Mädchen* or *committee*, they show variation in every slot in the hierarchy (attributive, predicate, relative pronoun and personal pronoun). In his major survey on hierarchies in Slavic languages, Corbett (1983:14-17) explores the possible agreement patterns with nouns of the *vladika*-type, such are *Sarajlije* 'Sarajevans', *zanatlije* 'artisans' and *gazde* 'masters' in the examples cited below. Scrutinising previous literature (Marković 1954; Stanojčić 1967; Babić 1973), he notes that '[t]he best evidence available, though patchy, does present a consistent picture; at each stage of the language's development which has been investigated, we find a monotonic increase in semantic agreement as we move rightwards along the hierarchy' (Corbett 1983:16).
In order to provide an overview of hierarchy effects in BCS, I rely on the illustrations provided by Corbett (2006:215-216) (the glosses from Corbett's work have been altered and simplified for the purposes of the present discussion). Attributive modifiers, even though they highly prefer grammatical gender agreement[27], also allow natural gender agreement:

(69) a. mnog-**e** Sarajlij-**e**
many-F.PL Sarajevans-PL
'many Sarajevans' (grammatical feminine gender)
b. mnog-**i** Sarajlij-**e**
many-M.PL Sarajevans-PL
'many Sarajevans' (natural masculine gender) (Marković 1954:95-96)

As (70) shows, predicates can optionally show either agreement in grammatical feminine or

[27] See Corbett (1983:16) for quantitative evidence on frequency of occurrences of grammatical and natural gender agreement with hybrid nouns in BCS.

natural masculine gender.

(70) a. Sarajlij-**e** su nadigral-**e** svog protivnika.
Sarajevan-PL aux.3.PL defeat-F.PL refl opponent
'The Sarajevans defeated their opponent.'

b. Sarajlij-**e** su dominiral-**i** terenom.
Sarajevan-PL aux.2.PL dominated-M.PL pitch
'The Sarajevans dominated the pitch.' (Marković 1954:95-96)

Perhaps one of the best illustrations of a possible mismatch between two slots in the hierarchy, where the attributive agrees in the grammatical, while the predicate agrees in natural gender, is provided by the following example:

(71) Ovim svojim radom naš-**e** zanatlij-**e** su dokazal-**i**...
this.INS refl.INS work.INS our-F.PL artisan-PL aux.3.PL proved-M.PL
'By this work of theirs our artisans proved...' (Marković 1954:95-96)

Moreover, citing Babić (1973:207), Corbett (1983:15) also shows that mismatches can obtain between other slots in the hierarchy, i.e. the attributive and the relative pronoun, as in (72). An attested mismatch is the one where the attributive modifier agrees in formal features, while the relative pronoun can show semantic agreement (72b). However, what never occurs is a situation such as (72c), where the attributive modifier shows semantic agreement, but the relative pronoun, one slot further to the right on the hierarchy, returns to formal agreement.

(72) a. mnog-**e** gazd-**e**, koj-**e** su se obogatile...
many-F.PL master-PL who-F.PL aux.3.PL refl got.rich
'Many masters, who have got rich...'

b. mlad-**e** gazd-**e**, koj-**i** tek počinju da izlaze...
young-F.PL master-PL who-M.PL just begin that go.out
'Many masters, who are just beginning to go out...' (Babić 1973:207)

c. *mlad-**i** gazd-**e**, koj-**e** tek počinju da izlaze...
young-M.PL master-PL who-F.PL just begin that go.out
'Many masters, who are just beginning to go out...'

Similar patterns for different varieties of Bosnian/Croatian/Serbian were reported in later works by Wechsler and Zlatić (2003); Leko (2010); Alsina and Arsenijević (2012*b*,*a*); Despić (2016); Despić (2017).

The instances of mixed agreement patterns can be summarised as in Table 2.1, following (Corbett 1983:27). Grammatical gender agreement is indicated in small caps, whereas natural gender agreement is indicated in big caps. Parentheses indicate lower relative frequency of a form. The table shows that German has a strict cut-off point between relative and personal pronoun, while in English this point is found already between attributive and predicate, as well as that such a point does not exist in BCS, but the effects are nevertheless reflected in the frequency of natural gender agreement.

	attributive	predicate	relative pronoun	personal pronoun
German: *Mädchen*	N	N/A	N	N / F
English: *committee*	SG	SG/PL	SG/PL	SG/PL
BCS: *gazde* 'masters'	F / (M)	F / (M)	(F) / M	M

Table 2.1: Agreement Hierarchy (Corbett 1991:235)

These patterns are not isolated cases – many more can be found in many other languages, surveyed by Corbett, but also reported later in the literature. Focusing only on Slavic languages Corbett (1983:27) offers a relatively extensive overview of a number of interesting cases. Some of the hybrid agreement controllers listed there, like the noun *děvče* 'girl' in Czech or *devojče* 'girl' in BCS pattern with the German *Mädchen* - they have neuter grammatical and natural feminine gender, which is revealed in agreement with personal pronouns. Some titles, like *her Majesty* in Polish and Russian (but also in French and Spanish), agree in grammatical gender with attributive modifiers, while most predicates as well as pronouns reveal the semantic gender of the distinguished referent. However, these constructions can also be considered *imposter constructions* (Collins and Postal 2012). Here we have an additional conflict in the representation of person features, since we are addressing an individual by use of a third person construction. These patterns will be a matter of future research, pending a deeper understanding of the interplay of person and gender features, as well as the possibility of having both *natural* and *grammatical* person. Nouns such as *vrač* 'doctor' in Russian are masculine in form, but they can control either formal or natural gender agreement on all targets and thus, on a par with the BCS nouns we have seen, Agreement Hierarchy effects are mirrored in the relative frequencies of the given forms. These examples, together with some others identified by (Corbett 1983, 1991) are summarised in the following table (as before, big caps present semantic agreement, while small caps represent formal agreement and parentheses indicate lower frequency):

	attributive	predicate	relative pronoun	personal pronoun
Cz: *děvče* 'girl'	N	N	N	N/F
BCS: *gazde* 'masters'	F / (M)	F / (M)	(F) / M	M
Pol: titles ('her Majesty')	F	M	M	M
Rus: titles ('her Majesty')	N	N / M	?	M
Rus: *vrač* 'doctor'	M / (F)	M / F	(M) / F	F
French: titles	F	F	F	F / M
Spanish: titles	F	M	M	M

Table 2.2: Agreement Hierarchy cross-linguistically (Corbett 1983:27, Corbett 1991:235)

The evidence above leads to the conclusion that Agreement Hierarchy is a real phenomenon, present crosslinguistically and evident whenever an agreement controller is specified for different ϕ-features. From a theoretical standpoint, it is desirable to make both the optionality

and the restrictions follow from independent principles of grammar. The remainder of this part of the dissertation is dedicated to developing a system that can derive these facts in a principled way.

2.1 Agreement Hierarchy in syntactic theory

One of the central puzzles that my account is going to focus on are the patterns of agreement with split hybrid nouns, introduced in Section 1.1.1 and illustrated in examples (69) – (72) above. These nouns seem to pose problems for many current theories of hybrid agreement, both in how to derive the optionality in the plural, but also how to restrict the optionality in terms of the limitations of the Agreement Hierarchy. Accounts that mostly focus on the BCS data, such as Wechsler and Zlatić (2003) and Despić (2017) try to provide an explanation for the possibilities of semantic and formal agreement with hybrid nouns in BCS. Yet, these proposals do not (at least not explicitly) derive the Agreement Hierarchy effects between two slots such as attributive and predicate. Moreover, since for Wechsler and Zlatić (2000, 2003) masculine gender on split hybrid nouns is a matter of optional assignment of natural gender features on these nouns in the plural, the issue remains how to constrain them such that if they are visible to the adjective, they must be visible to the predicate, but the reverse does not necessarily hold. Once they are introduced, the features should be constantly present on a noun, which rules out any potential mismatches.

As already mentioned above, Despić (2016); Despić (2017) derives feminine agreement with split hybrid nouns in the plural as a result of an Impoverishment operation which deletes the marked natural masculine gender in the presence of plural number. According to this account, the source of variation in different languages/dialects/speakers lies in the availability of Impoverishment rules that mitigate against marked features. 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. A possible solution could be that markedness constraints are less restrictive with predicates. However, 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 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.

Some additional accounts of the Agreement Hierarchy effects, such as those by Pesetsky (2013); Landau (2016); Smith (2015, 2017), even though successful at deriving the set of data they are interested in, would not be able to account for the BCS data. However, since a detailed evaluation of these accounts would take us too far afield, I will postpone the discussion of those accounts until 3.4 below. In short, Pesetsky (2013) and Landau (2016) would have to assume that

natural gender is optionally present on the noun and the switch to natural gender agreement occurs when this feature is present. Yet, this approach would not straightforwardly extend to BCS since there is evidence that the natural gender is not optional on the split hybrid noun. On the other hand Smith (2017) assumes both kinds of gender are present on the noun, but the natural, or interpretable, gender may be optionally made invisible for Agree. Under such an account, we would have to assume that such deactivation is possible only in the plural in BCS, which does not lend itself to an straightforward technical implementation. In sum, split hybrid nouns prove to pose a challenge for all previous accounts. I will show that the account I develop here can tackle both them, as well as data presented in other accounts on Agreement Hierarchy effects.

2.2 Interim summary

The short survey of the available evidence for the Agreement Hierarchy presented so far suggests that there are two important aspects that any theory of hierarchy effects should be able to cover:

(73) *Aspects of the Agreement Hierarchy*

a. **Agreement Restrictions** → once an element on the hierarchy shows semantic agreement, all other elements to the right of the hierarchy must also show semantic agreement.

b. **Distance Principle** (cf. Corbett 1983, 1991, 2006, Landau 2016:1004) → semantic agreement tends to appear more readily on elements that are more linearly distant to the controller (e.g. relative pronouns or verbs are more likely to show natural gender agreement than nominal modifiers).

In this part of the dissertation, I propose a system that focuses mostly on the first aspect, i.e. the monotonicity. I claim that **Agreement Restrictions** result from the mechanism of agreement presented in the introductory sections. Optionality in formal and semantic agreement is derived through a combination of relativized probing for natural gender (and number) features and independent probing for gender and number restricted by the CAD. Agreement restrictions will follow once the mechanism is extended such that it applies for every probe in the derivation independently.

As for the Distance Principle, since in Corbett's work it was formulated on the basis of the linear distance from the controller, as well as in terms of relative frequency or 'likeliness' of occurrence of semantic agreement on certain targets, this issue does not seem a likely candidate for a narrow-syntactic explanation. Hence, it will be largely put aside. Since syntax as a computational system functions mostly in categorical terms, the patterns under scrutiny will be those those that syntax can or cannot derive. I will focus on deriving the possible, and ruling out the unattested patterns. For now I will assume that the frequency of occurrence of

particular patterns is a matter of grammatical processes outside of syntax proper.
Deriving Agreement Restrictions will be the broad topic of the following chapter, where Section 3.1 will be concerned with deriving the possible and impossible mismatches on a clausal level, between nominal modifiers and verbs, i.e. between the 'attributive' and 'predicate' slot in the hierarchy. The discussion will after that, in Section 3.2, move to a micro-level within the DP, where the same agreement relations, restrictions and mismatches between nominal modifiers will be accounted for by the same mechanism. An evaluation of the present analysis with respect to previous accounts dedicated to deriving Agreement Hierarchy effects will be the broad topic of Section 3.4.

Chapter 3

A derivational account of Agreement Hierarchy effects

3.1 Mismatches in different slots of the hierarchy

A very clear illustration of agreement hierarchy effects comes from agreement with split hybrid nouns in BCS. These nouns denote human animate male referents and are assigned natural masculine gender accordingly. This gender is reflected in the masculine agreement they trigger on different agreement targets, such as adjectives and verbs in (74a). But such nouns have a curious property, as noted above (Section 1.1.1) – they show additional gender variation along the number divide. In the singular, they always trigger masculine agreement – straightforwardly reflecting the natural gender on the noun – but in the plural, they can trigger either masculine or feminine agreement (74b). I take this feminine gender to be a reflex of grammatical gender on the noun.

(74) a. {Star-**i**/*star-**a**} vladik-**a** me je juče {poseti-**o**/*posetil-**a**}.
old-M.SG/old-F.SG bishop-M.SG me is yesterday visit.PRT-M.SG/visit.PRT-F.SG
'The old bishop visited me yesterday.'

b. Star-**e** vladik-**e** su se posvađal-**e**/posvađal-**i**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Old bishops had an argument.'

Variation between masculine and feminine agreement in the plural is not entirely free. Mismatches between two different agreement targets, e.g. a verb and an adjective, abide by the Agreement Hierarchy:

(75) a. Star-**e** vladik-**e** su se posvađal-**e**/posvađal-**i**.
old-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Old bishops had an argument.'

b. %Star-**i** vladik-**e** su se posvađal-**i**/*posvađal-**e**.
old-F.PL bishop-PL are REFL argue.PRT-M.PL/argue.PRT-F.PL
'Old bishops had an argument.'

As (75a) shows, in case of mismatches between adjectival and verbal agreement, if the adjective shows grammatical gender agreement, the participle can still optionally show either grammatical or natural gender. However, as we can see in (75b), once the adjective shows natural gender agreement, no 'intervening decrease' is allowed (Corbett 1991:226), i.e. natural gender agreement needs to be maintained on all subsequent targets, hence the verb must show natural gender agreement as well. As mentioned briefly in Section 2.1 and discussed in more detail in Section 3.4, BCS split hybrid nouns pose a challenge for the competing recent approaches to hierarchy effects in agreement because the variation in gender agreement is dependent on the number on the noun. This clearly indicates that gender and number agreement necessarily need to interact and this chapter aims to explain exactly how they do it.
In this chapter, we will focus on deriving the attested mismatches between the two slots in the hierarchy using the mechanism developed in the introduction. In Section 3.1.2 the model of agreement developed in Section 1.2.2 will be applied to agreement on attributive modifiers, after which Section 3.1.3 will show how the result of attributive agreement directly influences verbal agreement. Moreover, mismatches within the same slot in the hierarchy, i.e. mismatches in agreement between multiple stacked adjectives, will be the topic of Section 3.2, showing that the same mechanism can derive all the attested patterns both within the DP and within the CP. Finally, Section 3.4 will show how the present approach fares with respect to other recent accounts of the Agreement Hierarchy effects.

3.1.1 Agreement on nominal modifiers: Preliminaries

Before delving into derivations of attested mismatches in agreement, let us first outline the main assumptions on how agreement operates on nominal modifiers. *Nominal modifiers* is the neutral term that will be used henceforth to refer to adjectives, demonstratives, possessives and all other elements that can modify a noun, which at the same time show reflections of agreement in number and gender with the noun they modify. This kind of agreement, whereby the nominal modifiers share the same ϕ-features and case features with the head noun, as in (76), is often referred to as CONCORD.

(76) a. ov-**a** moj-**a** star-**a** kuć-**a**
this-F.SG.NOM my-F.SG.NOM old-F.SG.NOM house-F.SG.NOM
'this old house of mine'

b. ov-**u** moj-**u** star-**u** kuć-**u**
this-F.SG.ACC my-F.SG.ACC old-F.SG.ACC house-F.SG.ACC
'this old house of mine'

I will avoid using this term here since analysing concord entails exploring case and ϕ-agreement together. This study views case and agreement as distinct processes and, being primarily interested in how the sharing of ϕ-features between the noun and the modifier works, it will have little to say about case.[28]

Furthermore, I will simply use the term *nominal modifier* to refer to DP-internal elements that show agreement with the noun, without making reference to their respective categories. The reason for this is that 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 will assume, for the sake of simplicity, that for the purposes of agreement, they are essentially the same elements (but see Section 3.2 below for more detail).[29]

In order to account for agreement on nominal modifiers, I follow Baker (2008); Carstens (2001, 2011); Danon (2011); Kramer (2009); Sigurðsson (2004); Toosarvandani and van Urk (2014) in assuming that such agreement is essentially a result of Agree.[30] This seems to be a point of general consensus in most of the generative literature that has addressed the problem of hierarchies and the interactions between adjectival and verbal agreement (Steriopolo and Wiltschko 2010; Matushansky 2013; Pesetsky 2013; Landau 2016; Smith 2015, 2017). A benefit of such a view is that it enables making clear parallels between agreement in the the nominal and clausal domains, as well as a meaningful unification of the two (cf. Abney 1987).

[28] Following the dependent case approach to case assignment, I adopt the view of Baker (2015), as well as Marantz (1991); McFadden (2004); Bobaljik (2008); McFadden and Sundaresan (2009); Bobaljik (2015), among others, in dissociating case from ϕ-agreement, as well as from grammatical function. I assume case to be assigned to DPs in particular configurations under c-command, in narrow syntax. How exactly dependent case then relates to ϕ-agreement, and how the same case and ϕ-features are shared by the noun and the modifiers is outside the scope of this thesis and will be left as an avenue for future research.

[29] These similarities have been a matter of some debate, leaving the status of possessives and demonstratives as a category in this language still relatively unclear. For instance, Bošković (2009*a*, 2013, 2016) and Despić (2011, 2013) 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. It is also supported by the fact that, just like adjectives, possessives and demonstratives can co-occur, their word order is not fixed, they can undergo left-branch extraction, and they are morphologically similar, cf. (76). In contrast, despite acknowledging that all nominal modifiers share the same inflectional morphology, Progovac (1998) still argues that they are of different categories, and in particular that pronouns are of category D.

[30] However, see Norris (2014:99) and references therein for arguments against treating the two as the same process. Based on data from Estonian, Norris (2014:100-102) claims that concord and verbal agreement cannot be the result of a fundamentally identical process because they diverge in a number of properties. For instance, (i) concord is expressed on multiple loci within the DP, unlike subject-verb agreement, where the ϕ-features of the subject are expressed only once, on the verb. Furthermore, (ii) elements showing concord are in distinct syntactic positions (concord may appear on heads (determiners, quantifiers), specifiers (demonstratives, pos-

Further on, following Baker (2008); Danon (2011); Pesetsky (2013); Landau (2016); Smith (2017), among others, I assume that every adjective is a probe. I follow Svenonius (1994); Norris (2014); Bošković (2009*a*, 2013) in treating adjectives as adjuncts (pace Abney 1987; Bernstein 1993 who assume adjective occupy head positions, or Cinque 1994 who locates them in specifier positions). The precise place of adjunction is not relevant for the present purposes. Nevertheless, since adjectives (and nominal modifiers in general) 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.[31] As for possessives and demonstratives, I will follow Progovac (1998) in assuming they are located in D (pace Bošković (2009*a*, 2013, 2016); Despić (2011, 2013), see footnote 29 for some discussion).

In order to show how exactly the nominal modifier has access to both gender features, and how it targets them in the process of agreement, let us recapitulate on the basic assumptions outlined in the introductory sections:

1. **Structure of DP:** Number and gender are valued features on DPs, represented on separate projections. *n*P contains natural gender features (if present on a noun) (Kramer 2014), NumP is projected above *n*P and hosts plural number features (Picallo 1991; Bernstein 1993; Borer 2005; Kratzer 2007; Acquaviva 2008; Harbour 2008), GenP is projected

sessors) and adjuncts (adjectives)). Additionally, (iii) the origin of features is different in verbal agreement and concord; while the agreement features that the verb shows originate on a different extended projection (DP), 'concord features of the adjective come from the element that is within the same extended projection that contains it' (Norris 2014:101). Finally, (iv) there is some connection between subject-verb agreement and case (verbal agreement targets the element with certain case), but there is no such connection with concord (e.g. adjective-noun agreement does not depend on case in the same sense). While I will not attempt to disprove every point of this criticism, it is worth noting that (i) does not hold in BCS, as verbal agreement can in fact appear on multiple loci, e.g. on two participles as in (i):

(i) a. Ona je bila otpuštena.
she is.3.SG been.F.SG fired.F.SG
'She was fired.'
b. Ona je bila napisala pismo.
she is.3.SG been.F.SG written.F.SG letter
'She had written a letter.'

The second point also need not necessarily hold for BCS, since nominal modifiers within the DP can all essentially be treated as adjuncts in this language (cf. Bošković 2009*a*, 2013, 2016). As for the origin of features (iii), it will be illustrated below that their ability to be targeted does not depend on the projection that contains them, but rather the properties of the probe that targets them. I therefore continue to apply the same Agree mechanism to both types of agreement.

[31] As for the structure of adjectival phrase, I follow Baker (2008, 2011) in assuming that there is a functional projection above the AP layer, which is responsible for carrying out agreement and providing agreement inflection, as well as interpretational information. However, since this point will only become relevant in Section 6.5 below in the discussion of agreement with predicate adjectives, I do not represent the full structure in the derivations in this chapter. Therefore, I will refer to adjectives by simply labelling them as *Adj*, disregarding their category for ease of exposition, pending a more detailed discussion in the parts where the structural properties of adjectives become crucial.

above it and it encodes grammatical gender.

2. **Feature hierarchy:** Natural gender is a featural composite consisting of values [F/M [anim]] in a hierarchical relationship (cf. Harley and Ritter 2002). It is thus featurally more complex than grammatical gender, as it includes an additional animacy specification.

3. **Relativized probing:** The gender probe in BCS is relativized (cf. Béjar 2003; Béjar and Řezáč 2009; Georgi 2012, 2013; Nevins 2007, 2011*b*; Preminger 2014) to look for natural gender features. It is specified as [$*\gamma$:□[anim:□]$*$].

4. **Cyclic Agree:** If the probe does not find a single element that contains all the corresponding valued gender features, Agree cannot result in valuation. This triggers the second cycle of Agree in which the probe gets reduced to the root node and only looks for [$*\gamma$:□$*$] features (Béjar 2003; Béjar and Řezáč 2009; Preminger 2014).

5. **Order of operations on the same head:** Agree operations triggered by a single head are ordered, but the precise order of such operations is underspecified (Müller 2009; Georgi 2014; Assmann et al. 2015). As a result, Gender Agree can precede or follow Number Agree.

6. **Locality of Agree:** Regulated by the following condition:

   (77) *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.

7. **Failed Agree:** Agree is obligatorily triggered in appropriate circumstances, but its failure to find an appropriate goal does not lead to a crash, but to default valuation of the features in question (Preminger 2014).

With these preliminaries in mind, let us turn to the derivations of the specific patterns.

3.1.2 Agreement on nominal modifiers: Deriving the patterns

With the preliminaries on agreement of attributive modifiers in place, we can now turn to deriving alternations between natural and grammatical gender agreement with split hybrid nouns in BCS. These nouns alternate only in the plural, which is why the plural examples will be under closer scrutiny. Recall that the pattern that we want to derive is the one given in (78) and (79). In this section, agreement possibilities will be illustrated on demonstratives, as D elements, while adjectival agreement will be closely examined in Section 3.2.2 below.

(78) a. On-**e** vladik-**e** su se posvađal-**e**/posvađal-**i**.
those-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Those bishops had an argument.'

b. ?%On-**i** vladik-**e** su se posvađal-**i**/*posvađal-**e**.
those-F.PL bishop-PL are REFL argue.PRT-M.PL/argue.PRT-F.PL
'Those bishops had an argument.'

(79) a. mnog-**e** Sarajlij-**e**
many-F.PL Sarajevans-PL
'many Sarajevans'

b. mnog-**i** Sarajlij-**e**
many-M.PL Sarajevans-PL
'many Sarajevans' (Marković 1954:95-96)

The agreement patterns in (79) clearly show that we are dealing with nouns that have two different gender features (natural masculine and grammatical feminine), while the patterns in (78), with different agreement on the adjective and the verb, reveal that these features are present on the noun simultaneously. Both gender features can therefore be targeted by the nominal modifier, which lead us to conclude that they somehow have to be in the modifier's Agree search space.

In order to apply the model to DP-internal agreement, I assume that nominal modifiers, like all other ϕ-probes, must perform both Gender Agree and Number Agree in order to value their unvalued gender and number features, and that the order of application of these operations is free for each modifier. The order in which they apply, however, has a direct impact on the outcome of the valuation process. If Gender Agree precedes Number Agree, this will yield natural gender agreement, while the reverse order of operations will result in Number Agree blocking or bleeding agreement with natural gender, forcing instead the grammatical gender valuation:

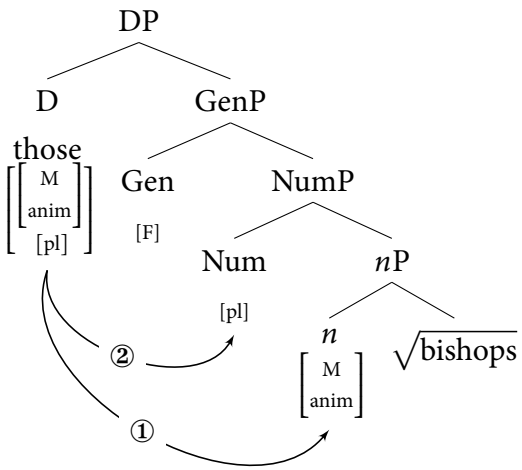
(80) a. Gender Agree > Number Agree → natural gender agreement
b. Number Agree > Gender Agree → grammatical gender agreement

In order to derive the possibility of natural gender agreement, as in (78b) and (79b) above, Gender Agree needs to apply before Number Agree. This means that the gender probe, relativized towards the natural gender ([$*\gamma$:□[anim:□]$*$]), will be discharged first and start looking for matching features in its c-command domain. The grammatical gender feature [F] on Gen will not be a matching goal for this probe, since it lacks the animacy specification. The probe therefore continues its search down the structure until it finds the matching [M[anim]] values on *n*. As a result, D's gender feature will be valued by the natural masculine gender of the noun.

The next step is number agreement. It applies by discharging the number probe from the D, thereby initiating the Number Agree operation. This probe finds the matching feature on the

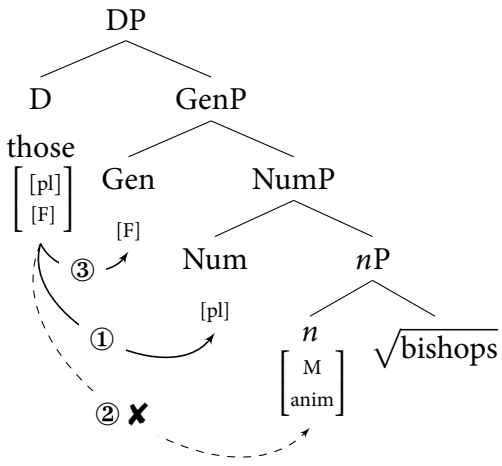
Num head, whose [#:pl] value is then copied onto D. The result is masculine plural agreement.

(81) Natural gender ([∗γ:□[anim:□]∗] > [∗#:□∗]):



Grammatical gender agreement on the demonstrative, as in (78a) and adjective, as in (79a), results if Number Agree precedes Gender Agree. Under this order, the number probe will reach the Num head and value its unvalued feature with [#:pl]. The next operation to apply will necessarily suffer the consequences of this derivational step, namely that it cannot target any goals c-commanded by the head previously targeted (as per the CAD (48)). In practice, this means that the gender probe can no longer reach the *n* head and the natural gender feature on it. The first cycle of Gender Agree will therefore fail and the next one will be initiated. In the second cycle, the probe's features are reduced to the root node ([∗γ:□∗]), which means that it can now be valued by the features of arbitrary complexity. As a result, Gen can now be targeted and the grammatical gender value [F] can be copied onto D. The result of the process is feminine plural agreement, as in (82).

(82) Grammatical gender ([∗#:□∗] > [∗γ:□[anim:□]∗]):



As noted in the introduction, this basic mechanism of ϕ-agreement illustrates the Relativized

Minimality (Rizzi 1990) effects in relativized probing for gender: 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 and since partial valuation of the [$*\gamma$:□[anim:□]$*$] probe is disallowed. If the gender probe has free access to the natural gender in the first derivational step, the more complex, fully matching feature, will be targeted even though it is lower in the structure. Thanks to the effects of the CAD, however, this situation is blocked if a higher part of the structure has already participated in agreement. As a result, the mechanism above shows that variation between natural and grammatical gender agreement can be captured through intervention effects by number agreement operations, which can be derived from independent theoretical assumptions, i.e. as a result of a conspiracy of relativized probing, separate probing for number and gender and the Condition on Agree Domains.

3.1.3 Agreement on predicates: The interaction of concord and verbal agreement

Having seen the results of the application of the system in agreement on nominal modifiers, taking up on the results obtained, in this section, it will be shown how the effects of the Agreement Hierarchy follow directly from the interaction of adjectival and verbal agreement. Before deriving the verbal agreement, recall that in BCS, both the participle and the finite verb show agreement in number, whereas only the former shows gender agreement:

(83) Marija je kupila knjigu.
Mary aux.3.SG buy.PRT.F.SG book
'Mary bought a book.'

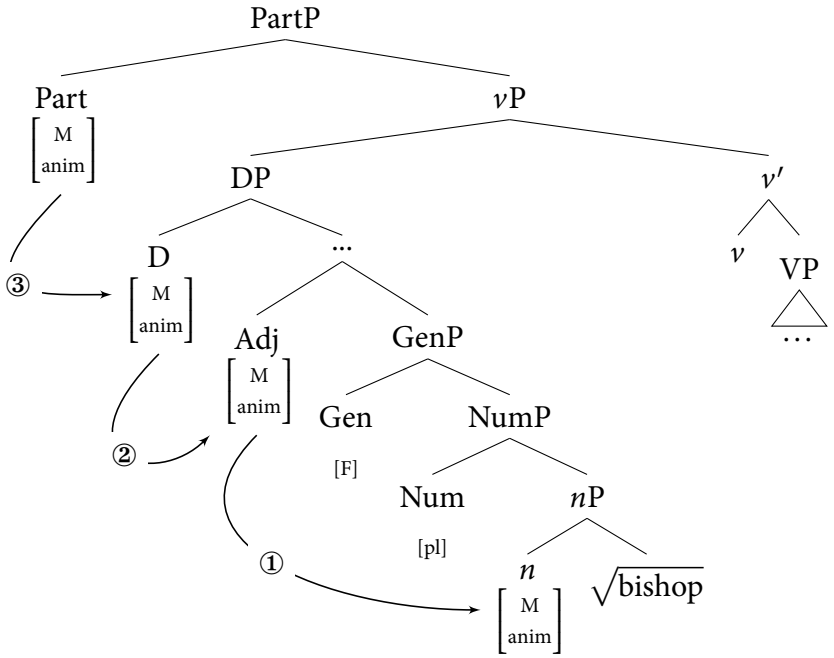
I assume that the participle heads a Part projection, projected above the *v*P (Bošković 1997; Bošković 2009*b*; Adger 2003; Migdalski 2003, 2008) and carries probes for number and gender, just like the nominal modifiers above. Finite verbs will be left out of the current discussion due to their lack of gender agreement, but we will return to them in Part 3 of the dissertation. Starting from the more restrained part of the Agreement Hierarchy, let us focus on deriving the Agreement Restrictions. The pattern of interest is the one given in (78b), repeated in (84). Once the nominal modifier shows semantic agreement, having grammatical agreement on the verb becomes impossible.

(84) ?%On-**i** vladik-**e** su se posvađal-**i**/*posvađal-**e**.
those-F.PL bishop-PL are REFL argue.PRT-M.PL/argue.PRT-F.PL
'Those bishops had an argument.'

One of the key assumptions necessary to derive these effects is to treat the nominal modifier essentially as both a probe and a goal (in a sequential sense). After modifier has performed Agree operations as a probe, its unvalued ϕ-features receive certain values which were copied from different goals (*n*/Gen and Num). These values can then be found on and copied from

the modifier by higher probes. What this means in practice, for instance, is that once the Adj has agreed with, and copied, a natural gender feature, any higher probe, including D and the participial probe, looking for natural gender should be able to find this feature already on the closest head, and it will not have to continue the search all the way down to the *n*, as sketched in (85).

(85) Agree between nominal modifiers and Part:



Note that I assume that the order in which the elements probe is the order in which they are merged in the structure. A probe will start looking for valued instances of its unvalued features as soon as it enters the derivation (cf. the Earliness Principle, Pesetsky 1989). As Part will enter the derivation at a later and a structurally higher point, it will always probe after the nominal modifiers have already agreed. This excludes the option of the nominal modifier getting its features from the participle.

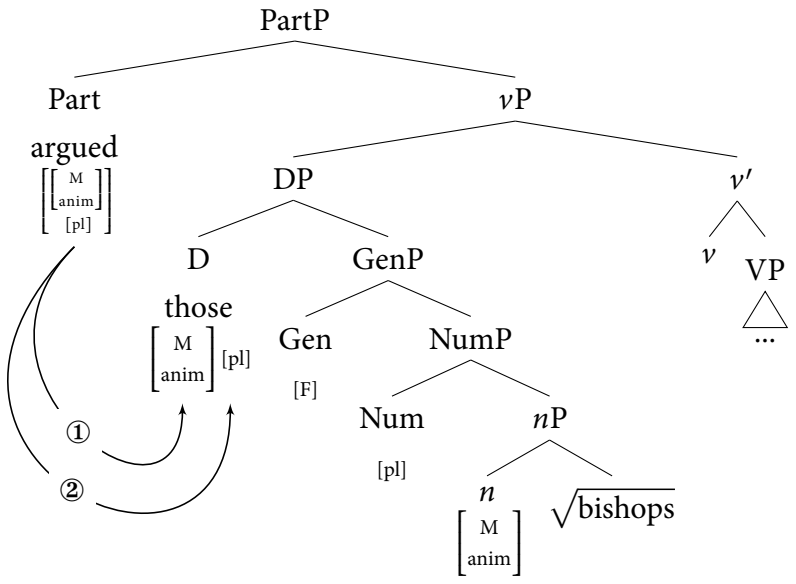
This option is all we need to explain the Agreement Restrictions aspect of the Agreement Hierarchy. The ability of an element to be first a probe and then a goal follows from the architecture of the system. Since I assume that probes can be articulated, I essentially adopt Preminger's (2014:49) approach where the probes have 'empty feature geometry containers'. These containers are filled via Agree, by copying the entire feature structure of the goal. As such, the features that the probe receives are essentially the same as those on the goal it has targeted. Therefore, the features that the goal receives are not instances of valued uninterpretable features in the sense of Chomsky (2000, 2001), which cannot be copied by further goals or participate in further Agree operations.[32] In the feature geometry approach, those

[32] Although, see Bošković (2009*b*, 2011), as well as Smith (2015, 2017) for approaches in which valued uniterpretable features are a viable goal for Agree.

features can never be deactivated and made invisible, thus it follows that they can be detected by subsequent probes.

In order to derive the restriction to semantic gender as in (84), we need to return to the derivation in which the modifier has agreed with (and projected) natural gender features of the hybrid noun. If the modifier has agreed in natural gender as in (81) above, it now contains the more complex, [M[anim]] gender values. These features can be targeted by external probes. Assuming that the order of probing is the same on the participle, and that Gender Agree precedes Number Agree, the first operation will search for the closest natural gender feature. The gender probe does not have to look far down in the structure, as the natural gender is present on the demonstrative. The consequence of this derivational step is that, according to the Condition on Agree Domains, the next operation, Number Agree, cannot search past the goal that has already been targeted. Luckily, D also contains the [#:pl] feature, which can value the Part's unvalued number feature (86).

(86) Natural gender: [∗γ:□[anim:□]∗] ≻ [∗#:□∗]

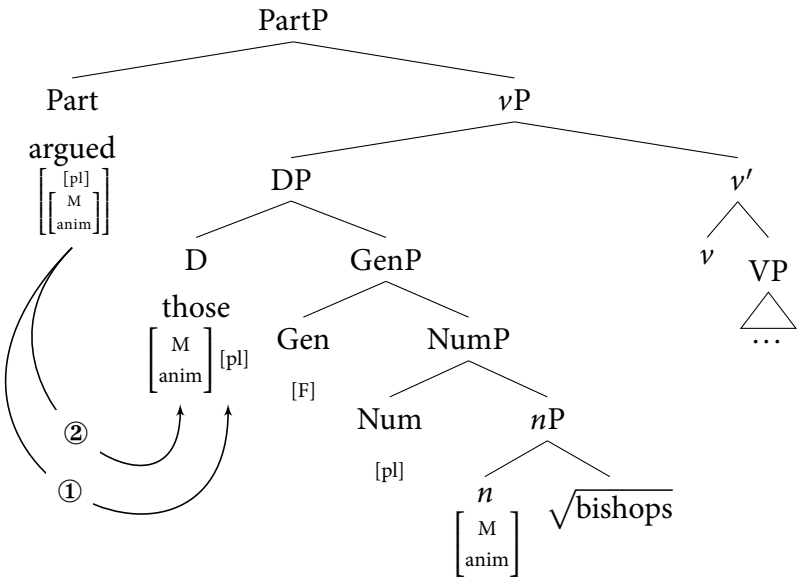


As a result, the Part's features are entirely valued by the features of D. This approach takes the influence of attributive agreement on predicate agreement quite literally, making the connection between the two clear, direct and easily derivable.

Since the assumption of free order of operations on every probe is one of the crucial ingredients of the analysis, it is important to note that the opposite order of operations on the Participle leads to the same outcome. If the order Number Agree ≻ Gender Agree applies on the Part head, natural gender features, as well as number features from the demonstrative will again serve as goals for these operations. This is so because the first operation, Number Agree, would target the [#:pl] feature on D, delimiting the domain for the following Agree operation, due to the CAD. Gender Agree would then have to target the same goal, which in this case has exactly the matching values for the relativized gender probe. The result is again natural

gender agreement on Part, as in (87).

(87) Natural gender: [∗#:□∗] ≻ [∗γ:□[anim:□]∗]



The system yields exactly the right and the desired result. Once the natural gender feature has been copied onto a projection higher than its original *n*P position, targeting the grammatical gender on the GenP becomes impossible, as the higher gender will always be the most available one. This is how grammatical gender agreement is ruled out on the participle, which derives the Agreement Restrictions, essentially under any order of operations.

On the other hand, the optionality between natural and grammatical gender agreement on the participle if the adjective agrees in grammatical gender, illustrated by (78a) and repeated in (88), can also receive a principled explanation under the present account.

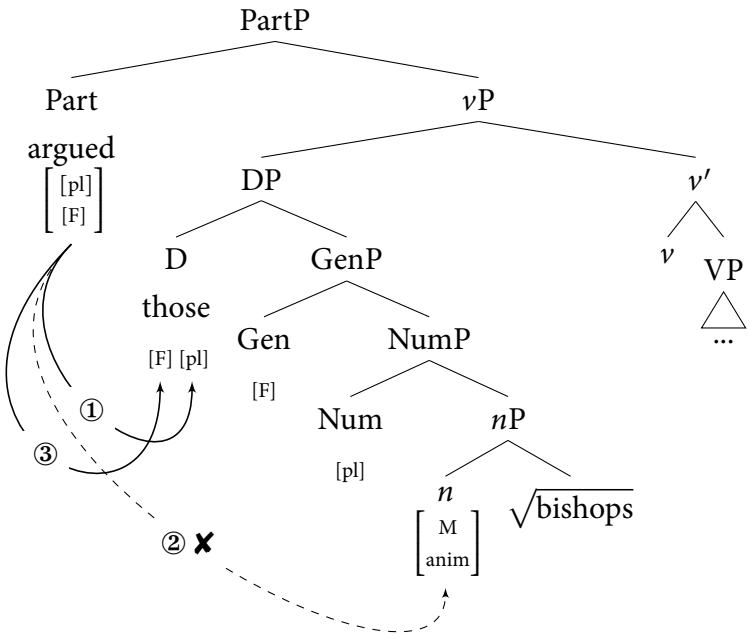
(88) On-**e** vladik-**e** su se posvađal-**e**/posvađal-**i**.
those-F.PL bishop-PL are REFL argue.PRT-F.PL/argue.PRT-M.PL
'Those bishops had an argument.'

This is where the effects of Relativized Minimality in relativized probing will play a decisive role. The demonstrative in (88) has a grammatical feminine gender value. This means that it projects the less complex [F] feature, just like Gen (from which this feature is acquired, as in the derivation (82) above). In effect, this means that natural gender on the *n*P should still be available for agreement, simply by virtue of being the more complex, and thereby the preferred one, even though there are two grammatical gender features above it (one on Gen and one on D).

Grammatical gender agreement on the demonstrative in (82) was the result of Number Agree preceding Gender Agree. In consequence, the features [F,#:pl] were projected to D. If this order of probing is maintained on the Part, it will lead to the same result, i.e. valuation by

the grammatical gender [F] value, due to the CAD. Specifically, the first Agree operation will target the D, which carries the [#:pl] feature (rather than the lower Num, which carries the same feature, but which is in this case a more distant goal). This creates an Agree domain within which Gender Agree has to apply. This operation cannot then target any lower phrases and it is forced to copy the [F] value of grammatical gender, also present on the adjective, as in (89).[33]

(89) Grammatical gender: [∗#:□∗] ≻ [∗γ:□[anim:□]∗]



The derivation above nicely illustrates the principles of economy and derivational restrictions at work. The number probe will simply target the closest available number feature, rather than searching for its original instance on the Num head. Afterwards, the gender probe has a limited choice, taking the only gender feature it can find in the restricted Agree domain.

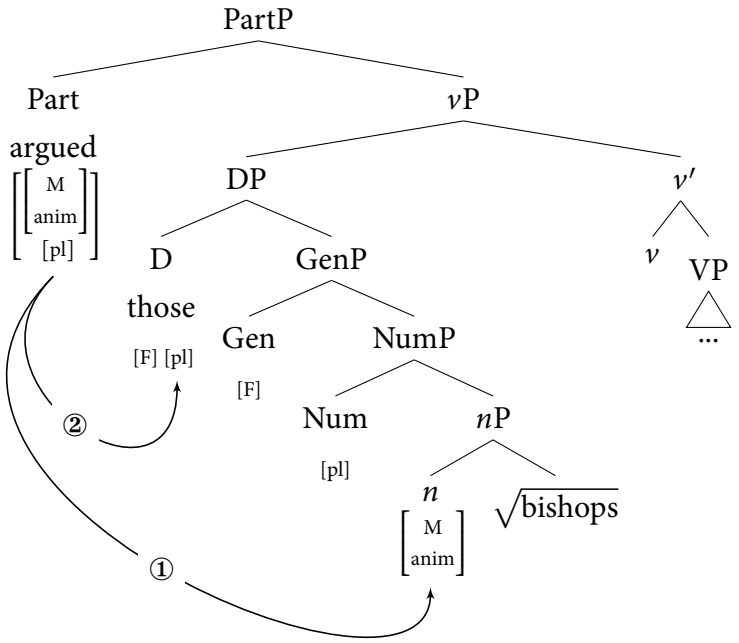
In deriving the optionality of gender agreement on the Part in case when the demonstrative has the grammatical gender feature, the possibility of undefined order of operations plays a crucial part. Maintaining the assumption that the order of operations is free at the PartP as well and that Gender Agree can apply before Number Agree, we can derive natural gender agreement at this level too.[34] The first operation will be triggered by the relativized [∗γ:□[anim:□]∗]

[33] According to previous assumptions, this process will involve two cycles of Gender Agree, the first one in which the [∗γ:□[anim:□]∗] probe fails to find the natural gender feature, and the second one, in which the reduced probe [∗γ:□∗] searches for gender of any value.

[34] This assumption might seem to contradict the account developed in Murphy and Puškar (to appear), where it is argued that the given order of operations has to be maintained throughout the derivation and repeated by each head. However, that account focuses on the interaction of agreement and movement and inspects the possible ordering of all three core syntactic operations – Merge, Move and Agree. Moreover, in that account, only Gender Agree is under scrutiny, while Number and Person Agree are largely left aside. The account has nothing

probe. This probe will search through the DP for natural gender, passing by the D and Gen, both of which contain the [F] feature which is not the perfect match, reaching finally the preferred feature on *n*.[35] The following operation, Number Agree, will target the D head, as this is the first goal where the number features are available. The result is the natural masculine gender on Part, as in (90).

(90) Natural gender: [∗#:□∗] ≻ [∗γ:□[anim:□]∗]



The mechanics of our basic system thus derive the optionality as a result of the conspiracy of relativized probing and CAD. Relativized probing successfully models the preference of BCS speakers for the agreement in natural gender. Whenever this feature is available for the Gender Agree operation, it will be used to value the probe's unvalued gender feature. Crucially, this feature can only be reached if no other Agree operation has applied before. However, this condition, i.e. the Condition on Agree Domains, essentially holds on every probe, and not universally throughout the derivation. This is why even though D has already probed before and its Agree operations have established certain domains, those domains do not remain functional at the time when Part probes. The general implication that this has on the theory of Agree is that what drives agreement is not the activity of the goals, which would have to be deactivated somehow before the end of the derivation (cf. Activity Condition, Chomsky 2001). Rather, it is the probes that are gradually used up, until they become 'exhausted'. This implies that agreement relations are governed more by the properties of probes than those of goals (see Keine 2016 for similar claims). What matters for this probe is only the structural

to say about the timing and mutual ordering of separate Agree operations. It can thus be well imagined that what is simply termed Agree in that account is actually a bundle of the three separate operations. These operations could then in principle vary among each other, but should be strictly ordered with respect to Move/Merge. I leave this interaction for further research.

[35] See Section 3.1.4 for a discussion on why D does not act as a barrier for agreement in this derivation.

position of the features it searches for. We have also seen that a particular derivational choice even at a very early stage of the derivation (e.g. on adjectives) can have a deterministic effect on the later stages of the derivation (e.g. on Part or other probes). Finally, the dependence between adjectival and verbal agreement is captured by means of a real syntactic interaction and the exchange of morphosyntactic information between the two.

3.1.4 Gender probing and locality

This section presents a brief excursus with a discussion of the system I propose vis-á-vis the original formulation of Agree given by Chomsky (2000, 2001). The discussion points out some alterations in the realm of locality domains proposed by my system, as well as showing that some parts of the original formulation cannot be maintained for independent reasons. Consider the following definition of Agree formulated by Baker (2008), based on Chomsky (2000, 2001):

(91) F agrees with XP, XP a maximal projection, only if:

a. F c-commands XP or XP c-commands F (the c-command condition).

b. There is no YP such that YP comes between XP and F and YP has ϕ-features (the intervention condition).

c. F and XP are contained in all the same phases (the phase condition).

d. XP is made active for agreement by having an unchecked case feature. (Baker 2008:65)

The condition (91a) is fulfilled by both the adjective and the participial probe in my account.[36] However, my account seems to challenge the intervention condition in (91b), as in the system above there is indeed 'a YP such that YP comes between XP and F and YP has ϕ-features'. This situation is found for instance when the gender probe skips an XP bearing a grammatical gender feature in order to search further down for the more appropriate match. In the traditional account, the grammatical gender feature would be considered a 'defective intervener'. Furthermore, the derivation in (90) seems to challenge the phase condition (91c), where the gender probe searches past D, as well as past a number of other ϕ-bearing phrases, all the way down to *n*. Assuming that DP is a phase, the challenge for the phase condition consists in the fact that Part belongs to the CP domain, while *n* belongs to the DP domain, therefore the probe and the goal are not contained in the same phase. However, in the light of some recent

[36] In order to maintain the c-command condition on adjectives, it is necessary to assume that they probe as a phrasal category, i.e. that they are simultaneously a minimal and a maximal projection, following the reasoning of Bošković (2013), who argues that since the head of the phrase is the element that labels the entire phrase, the head then must, for all intents and purposes be equal to the maximal projection. If they perform Agree operations then, both the head and the maximal projection are activated as probes (see Danon 2011; Norris 2014, but also Řezáč 2004:105 and Schoorlemmer 2009:81 for some discussion). However, as I adopt that the proposal of Baker (2008, 2011) that AP is selected by a head that regulates its agreement, the F_A, I assume that this head acts as the adjectival probe in the strict sense. The logic of the relation between the head and the maximal projection applies here as well – the F_A-head labels the F_AP, thus the head is equal to its maximal projection.

developments in the theory of Agree, despite the apparently nonstandard aspects, my theory in fact complies with the current approaches to agreement.

The two conditions in (91b) and (91d) are essentially complementary, and both of them are related to, and dependent on, another condition which was not listed in the definition, namely that the goal (DP) needs to be ϕ-complete in order to be able to value the (T/v/Part) probe's unvalued uninterpretable ϕ-features all at once. As Danon (2011:305) notes, distributing ϕ-features over several phrases within the DP, even though justified by various authors (cited throughout this thesis, but also summarised e.g. by Kramer 2015*a*) can be problematic since 'there is no ϕ-complete node that the T/v could agree with' (as gender features are on nP, number is on NumP and person features are usually assumed to be at D). This means that the ϕ-features of the T/v probe cannot be valued at once, and the DP cannot receive case in return. In order to circumvent this problem, the assumption of ϕ-completeness has to be abandoned, at the expense of abandoning the assumption on case and ϕ-Agree being the two sides of the same coin.[37]

Case has indeed been argued not to be a side effect of Agree, especially by the advocates of the Dependent Case Theory (Marantz 1991; McFadden 2004; Bobaljik 2008, 2015; Baker and Vinokurova 2010; Preminger 2014; Baker 2015, but see also Carstens 2001 for arguments in favour of dissociating case from agreement in concord). This also means that the activity of the goal for case assignment is not a necessary pre-condition for ϕ-agree to be carried out, therefore the condition (91d) does not necessarily need to hold. As a solution to the lack of ϕ-completeness, I have adopted a version of Danon's (2011) 'relativized ϕ-completeness', i.e. the assumption that not all probes actually require a full set of ϕ-features[38] supplemented by separate probing for individual features. That way gender probe will skip a number feature in its search domain in the same way it will skip a person, or aspect/tense/wh/case or any other morphosyntactic feature, simply because these are not the features of the kind it searches for and thereby cannot be interveners in any sense.

The final issue we are left with is the phase condition. The derivations of agreement on D in (81) and (82) have the D (often regarded as a phase head) probe inside its domain in search for features. The derivations of participial agreement may seem to pose a problem due to the fact that the Part probes for features inside the DP phase domain. This means either that

[37] This observation comes from Danon (2011:306). '[W]e would also have to abandon the view of agreement as an all-at-once operation, and assume instead that each of the different ϕ-features on T/v can act as a separate probe, with person, number, and gender each agreeing with a separate goal in the noun's extended projection.' This assumption has been independently evoked in the literature time and again in order to account for numerous empirical patterns in a variety of languages, showing that different ϕ-features are agreed with and processed differently. See, for instance, Picallo 1991; Laka 1993; Ritter 1993; Chomsky 2000; Anagnostopoulou 2003; Antón-Méndez et al. 2002; Béjar 2003; Carstens 2003; Řezáč 2004; Marušič, Nevins and Saksida 2007; Marušič et al. 2015; Preminger 2014 for dissociating gender and number agreement, and Bošković (2009*b*) and Arsenijević and Mitić (2016) for BCS in particular. See especially Carstens (2001); Béjar (2003) for further arguments against ϕ-completeness and in favour of separate probing for different features.

[38] Indeed as we have seen in BCS the Part and adjectives only look for gender and number, whereas finite verbs agree in person and number.

the DP phase is not too 'strong' and that access to its internal information is still possible, or that the D head accumulates all the features of its internal phrases and makes them accessible for external probes on the DP level. The first option would require weakening of the Phase Impenetrability Condition for Agree, i.e. allowing Agree to disobey it, as suggested by Bobaljik and Wurmbrand (2005); Bošković (2007). Another option would be to assume that DP is not a phase (at least in languages under discussion).

Note that I have adopted the assumption of there being a DP in BCS for the sake of uniformity and ease of exposition, even though the debate about its existence is still an ongoing one and many authors have argued against it (see Bošković 2005, 2012, 2016; Despić 2011, 2013; Runić 2014). If these arguments are correct and there is in fact no D in BCS, then the phasehood issue becomes much simpler (or rather, even more complicated because it has to be determined what exactly constitutes a phase in the nominal domain). But if the DP is actually present, in BCS it needs to be more flexible in its phasal status, as it is transparent for certain movement operations, such as Left Branch Extraction (92a).

(92) a. Čije$_i$ je Srđan upoznao [t$_i$ prijatelje]?
whose.PL.ACC aux.3.SG Srdjan met friends.M.PL.ACC
'Whose friends did Srdjan meet?'

I therefore assume that DP in BCS is transparent for agreement by virtue of not being a phasal category in BCS. As for other languages, this would have to be evaluated on a case by case basis, but the prediction would be that if their DP is a phase, they should not be able to show Agreement Hierarchy effects in ϕ-agreement. I leave this very interesting prediction for further research.

3.2 Mismatches in the same slot of the hierarchy

Having seen how agreement restrictions as well as alternations are derived between nominal modifiers and predicates, this section brings into focus a particular slot in the Agreement Hierarchy, inside of which mismatches can also be found, namely the 'attributive'. It is a well-known fact of natural language that multiple nominal modifiers can be stacked in front of a noun they modify. In a language with rich agreement patterns such as BCS, all the modifiers will usually agree with the features of the head noun they modify, reflecting its gender and number features:

(93) t-a moj-a nov-a velik-a crven-a knjiga
this-F.SG my-F.SG new-F.SG big-F.SG red-F.SG book
'this new big red book of mine'

However, if they modify a hybrid noun, modifiers can sometimes show different patterns of agreement. Some modifiers may agree with the grammatical features of the noun (e.g. *privatn-*

e 'private' in (94)), while others can reflect the natural, or semantic features of the noun (e.g. *ov-i* 'these' in (94)).

(94) ov-i privatn-e zanatlije
these-M.PL private-F.PL artisan.PL
'these private artisans' (Corbett 2006:206)

These observations have been around in the literature for some years (see Corbett 1991, 2006 for an overview and Crockett 1976; Wechsler and Zlatić 2003,Landau 2016; Smith 2017 for formal accounts). In this section, the evidence for the existence of Agreement Hierarchy effects in agreement mismatches with nominal modifiers will be provided at first in Section 3.2.1, followed by an analysis in terms of the proposal established so far in Section 3.2.2, which will be based on mismatches found with hybrid nouns in Russian. Russian is taken to illustrate the mismatches in the attributive slot because of its flexibility in agreement in this domain, as well as because it is the canonical example of these types of agreement interactions. BCS happens to be more restricted in the DP domain and rarely allows mismatches in adjectival agreement. A couple of examples, like (94), have been recorded in the literature, and in them the mismatches mainly occur between adjectives and D-elements. We return to this issue in Section 3.2.2.1 below.

3.2.1 Evidence for Agreement Hierarchy effects in the 'attributive' slot

Mismatches in agreement between nominal modifiers with hybrid nouns have been recorded in the literature in a number of unrelated languages. One of the most well-known and frequently-cited instances comes from Russian (see Crockett 1976:97, Corbett 1991:238-239, Landau 2016:1004f., Smith 2017). Russian nouns that exhibit these interesting patterns are nouns that belong to declension class I in this language, the class whose members mostly have grammatical masculine gender. The nouns in question thus have a fixed 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. Some of the nouns that exhibit this behaviour noted by Crockett (1976:92) include *vrač* 'doctor', *direktor* 'director', *kosmonavt* 'astronaut', *muzykoved* 'musicologist', *feldšer* 'medical attendant', *fotograf* 'photographer' 'and others which identify individuals by their speciality or social function'. Historically, these nouns were mostly used to refer to men, but as these social roles and occupations were taken up by women as well, in order to accommodate to the changes in the society, these nouns have undergone a change throughout the 20th century, from being strictly masculine, to being underspecified for gender. If the noun refers to a female person, the feminine gender assigned to it will be revealed by feminine agreement, as in (95).

(95) Éta prodavec medlenno otpuskaet.
this.F.SG salesperson slowly works
'This (female) salesperson works slowly.' (Crockett 1976:96)

However, even if the noun refers to a feminine person, the grammatical masculine gender can still surface in agreement, and both can be present on two different nominal modifiers (reflecting thereby the fact that this noun must bear two different gender features):

(96) a. V 17 – očen' xoroš-**aja** glavn-**yj** vrač...
in 17 very good-F.SG head-M.SG doctor ...
'In [hospital] no. 17 there is a very good (female) head doctor...'(Pesetsky 2013:37)

b. U nas byl-a očen' xoroš-**aja** zubn-**oj** vrač.
by us was-F.SG very good-F.SG dental-M.SG doctor
'We had a very good (female) dentist.' (Crockett 1976:97, Pesetsky 2013:38)

c. moj-**a** nov-**aja** klassn-**yj** rukovoditel' vsë pričital-a...
my-F.SG new-F.SG class-M.SG supervisor iter. complain-F.SG
'My new (female) class supervisor continually complained (that)...'
(Pesetsky 2013:38)

Furthermore, if mismatches appear on nominal modifiers, they have to show the distribution present in (96), namely a mismatch can only be such that the adjective closer to the noun agrees in grammatical gender, while the adjective further away agrees in the natural gender of the noun. The opposite pattern is impossible:

(97) a. ?U menja očen' interesn-**aja** nov-**yj** vrač.
by me very interesting-F.SG new-M.SG doctor
'I have a very interesting new (female) doctor.'

b. *U menja očen' interesn-**yj** nov-**aja** vrač.
by me very interesting-M.SG new-F.SG doctor
'I have a very interesting new (female) doctor.' (Pesetsky 2013:38)

These effects reflect both aspects of the Agreement Hierarchy – the Agreement Restrictions and the Distance Principle – within a single slot of the hierarchy, i.e. the 'attributive'. The Agreement Restrictions are reflected in the fact that once natural gender agreement has been established on an adjective, it has to be maintained on all other modifiers in the DP domain, the return to grammatical agreement is impossible. The Distance Principle is reflected in the fact that the further adjectives show agreement in natural gender more readily.[39]
Similar patterns were reported for hybrid nouns in other languages. Corbett (1991:239) records

[39] As observed by Crockett (1976:96) and Pesetsky (2013:37) i.a., agreement in natural gender is almost never instantiated on adjectives that tend to appear lower in the structure, such as the ones that have 'nonintersective, idiomatic or argumental interpretation' (Pesetsky 2013:37). Thus for the phrases *glavnyj vrač* 'head doctor', *klasnyj rukovoditel'* 'class supervisor' and *priiskovyj sčetovod* in (i), Crockett (1976:96) claims that the adjectives are simply kind modifiers, but they do not apply to the actual referent.

(i) a. Glavn-**yj**/*Glavn-**aja** vrač poliklinik-i skazal-a, čtoby...
head-M.SG/*head-F.SG doctor clinic-GEN.SG said-F.SG that...
'The (female) head doctor of the clinic ordered that...'

an instance of a DP-internal mismatch in class features in Chichewa. The noun *ngwazi* 'hero' is grammatically marked as a noun of class 9/10 in this Bantu language, triggering corresponding class 9/10 agreement on the nominal modifiers. However, since the noun refers to a human, it can also trigger class 1/2 agreement, as in (98a). If mismatches in agreement between attributive modifiers occur, they can only be such that the closer adjective shows grammatical class 9/10 agreement, while the further adjective shows the natural class 1/2 agreement (98b); the opposite pattern is impossible (98c).

(98) a. ngwazi y-athu y-oyamba / ngwazi w-athu w-oyamba
hero 9-our 9-first / hero 1-our 1-first
'our first hero'

b. ngwazi y-athu w-oyamba
hero 9-our 1-first
'our first hero'

c. *ngwazi w-athu y-oyamba
hero 1-our 9-first
'our first hero' [Chichewa] (Corbett 1991:239)

Furthermore, similar mismatches in the realm of number have been the topic of a recent paper by Landau (2016), based on agreement patterns with the Hebrew hybrid noun *be'alim* 'owners'. Landau observes that this noun in its grammatically plural form can still be used to refer to a single person. This situation gives rise to the possibility of both (natural) singular and (grammatical) plural number agreement with this noun. The restrictions on agreement are the same as before – in case of a DP-internal mismatch, it is only the adjective closer to the noun that can show grammatical (plural) number agreement while the adjective further away admits the natural (singular) number (99a). The reverse option is ungrammatical (99b).

(99) a. ha-be'alim ha-pratiyim ha-axaron šel ha-tmuna haya
the-owner the-private.PL the-last.SG of the-painting was.3.SG
ha-psixo'analitika'i Jacques Lacan.
the-psychoanalyst Jacques Lacan
'The last private owner of the painting was the psychoanalyst Jacques Lacan.'

b. *ha-be'alim ha-prati ha-axron-im šel ha-tmuna haya/hayu
the-owner the-private.SG the-last-PL of the-painting was.3.SG/PL

b. Klassn-**yj**/*Klassn-**aja** rukovoditel' soobščil-a Česnokovu, čto...
class-M.SG/*class-F.SG supervisor informed-F.SG Chesnokov that
'The (female) class supervisor informed Chesnokov that...'

c. Priiskov-**yj**/*Priiskov-**aja** sčetovod ser'ězno zabolel-a.
mine-M.SG/*mine-F.SG accountant seriously took-ill-F.SG
'The (female) mine accountant took seriously ill.' (Crockett 1976:96, Pesetsky 2013:37)

Since the restrictions in grammatical gender agreement of the lower adjectives will be the topic of the Section 3.2.2.1, I will postpone a more detailed account until then. However, I would like to note that I will essentially follow the suggestion made by Crockett (1976:101) that these constructions are lexicalised in the language to the point where they can be considered to be compounds, whereby the adjective would simply be treated as the initial part of such compounds.

ha-psixo'analitika'i Jacques Lacan.
the-psychoanalyst Jacques Lacan
'The last private owner of the painting was the psychoanalyst Jacques Lacan.'
[Hebrew] (Landau 2016:1005)

The data above convincingly show that mismatches in agreement do not occur only between different kinds of agreement targets (e.g. attributive vs. predicate vs. co-referential pronoun), but also within the same kind (e.g. the attributive). Regardless of where they occur, mismatches reflect the restrictions of the Agreement Hierarchy. This indicates that the agreement targets must have a way to communicate and transfer morphosyntactic information amongst themselves. In the sections to follow, we explore the nature of this communication.

3.2.2 Deriving mismatches with attributive modifiers

In this section we will explore how the agreement system developed so far applies to the elements in the 'attributive' slot, i.e. DP-internally. The results will mirror exactly those in interactions in agreement between Part and D – agreement on the higher probe will depend on the result of agreement operations carried out on the lower probe. The effects of the theory will be illustrated on the examples from Russian, taken from the previous literature on hybrid agreement, in particular Crockett (1976) and Pesetsky (2013). The nouns in question, such as *vrač* 'doctor' have grammatical masculine gender, but their natural gender can vary depending on the gender of the discourse referent. The evidence that the masculine is purely grammatical gender comes from the fact that when the gender of the referent is underspecified or irrelevant, or when the noun is used with a generic reference (to indicate just a profession) masculine agreement will obtain:

(100) U nas byl očen' xoroš-**oj** zubn-**oj** vrač.
by us be.PST.M.SG very good-M.SG dental-M.SG doctor
'We had a very good (male or female) dentist.' [Russian] (Pesetsky 2013:38)

The noun *vrač* 'doctor' can be used to refer to a female doctor. The sentence in (101a) shows that even with this specific reference, this noun can trigger grammatical (masculine) gender agreement, while (101b) illustrates that feminine agreement is also possible. The acceptable and impossible mismatches in adjectival agreement are reflected by (101b) and (101c), respectively. Once again, these patterns reflect the Agreement Restrictions. While the adjective that is closer to the noun can show grammatical gender agreement and the one further away natural, the opposite is impossible (101c).

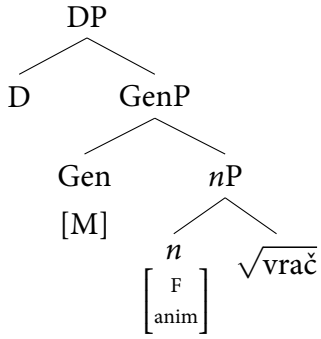
(101) a. U nas byl očen' xoroš-**oj** zubn-**oj** vrač.
by us be.PST.M.SG very good-M.SG dental-M.SG doctor
'We had a very good (female) dentist.'

b. U nas byl-**a** očen' xoroš-**aja** zubn-**oj** vrač.
by us be.PST-F.SG very good-F.SG dental-M.SG doctor
'We had a very good (female) dentist.'

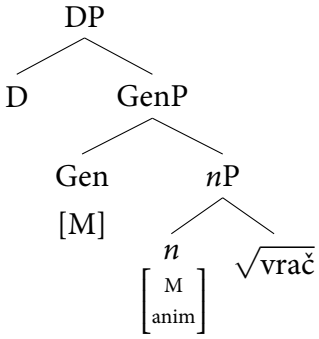
c. *U nas byl-**a** očen' xoroš-**oj** zubn-**aja** vrač.
by us be.PST-F.SG very good-M.SG dental-F.SG doctor
'We had a very good (female) dentist.' [Russian] (Pesetsky 2013:38)

The Russian *vrač*-type nouns are underspecified for natural gender, as noted above. Their behaviour thus resembles that of epicene nouns, i.e. nouns whose gender changes depending on the gender of the discourse referent, without a corresponding change in the noun's form. I follow Kramer (2015*a*:38f.) in treating these nouns as 'same-root nominals'. This means that the same root $\sqrt{\text{vrač}}$ can be licensed either under a nominalizer that has natural masculine or under one that has natural feminine gender features. Consequently, their *n* will bear either [F[anim]] or [M[anim]] features. Yet, since these nouns also have grammatical masculine gender, I assume that this gender is present on the GenP as an [M] feature. The structure of the DP with a female referent is given in (102), while (103) illustrates the same noun with a male referent. The tree in (104) shows the structure of the noun when the natural gender is left underspecified (as in (100) above).

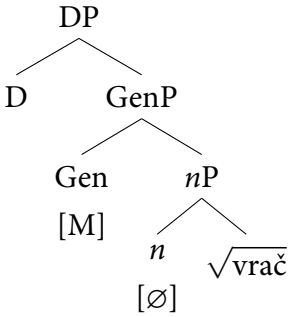
(102) Natural feminine



(103) Natural masculine



(104) Grammatical masculine



With the structural assumptions in place, we can now observe that a *vrač*-type noun with a female referent consists of a category-free root, a nominalizer with a feminine natural gender feature [F[anim]] and the GenP with a grammatical gender [M]. One difference between the Russian patterns here and the BCS ones we encountered in previous sections is that Russian allows for hybrid agreement in the singular number.[40] Since in BCS one of the causes of alternations was the structural position of number features, it is expected that similar assumptions can be extended to Russian. Since alternations appear in the singular in Russian, a straightforward way to capture the mixed patterns would be to claim that singular is not just the absence of number in this language but is in fact a real feature projected on NumP.

[40] In Russian, agreement targets that show gender agreement are syncretic for gender in the plural, hence no agreement mismatches or hybrid agreement effects can be observed in this environment.

Thus, having NumP projected in the singular allows it to intervene for Agree, yielding hybrid agreement patterns.[41]

Focusing first on the patterns of grammatical gender agreement, recall that such agreement is possible throughout the DP on all modifiers (105a), but a Russian native speaker may well utter (105b), with a switch to natural gender agreement on the higher adjective.

(105) a. U nas byl očen' xoroš-**oj** zubn-**oj** vrač.
by us be.PST.M.SG very good-M.SG dental-M.SG doctor
'We had a very good (female) dentist.'

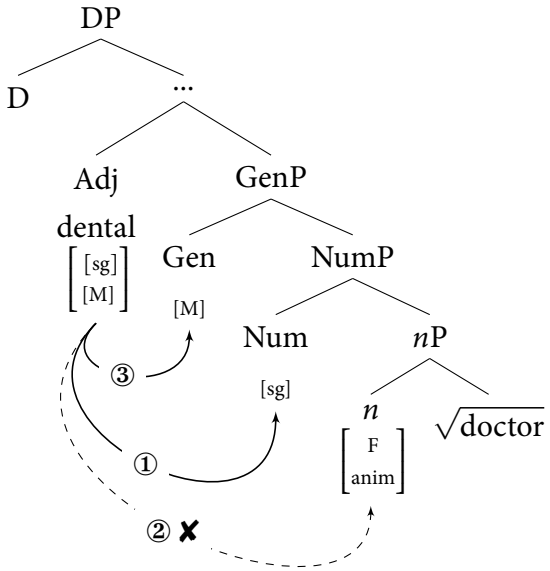
b. U nas byl-**a** očen' xoroš-**aja** zubn-**oj** vrač.
by us be.PST-F.SG very good-F.SG dental-M.SG doctor
'We had a very good (female) dentist.' [Russian] (Pesetsky 2013:38)

In our system so far, every nominal modifier is assumed carry both (natural) gender and number probes, as well as to perform Agree operations triggered by these probes in an underspecified order. While in the previous discussions we have seen how D-elements carry out these operations, we now turn to adjectival probes. As with D-elements, once an adjective has acquired ϕ-features, it can serve as a goal for Agree operations carried out by other c-commanding probes. Looking back at (105a), repeated below, we can see that the lower adjective *zubnoj* 'dental' agrees in grammatical masculine gender. Grammatical gender agreement, as shown so far, is the result of the number probe being discharged before the gender probe. In such a scenario, the Number Agree operation will be performed first, targeting the [#:sg] feature of the NumP. This derivational step determines the behaviour of the next Agree operation from the same head. Gender Agree can not search lower than the phrase that has already been targeted, respecting the CAD. As a result, the gender probe will target the higher GenP, copying the grammatical gender value as in (107):

(106) U nas byl očen' xoroš-**oj** zubn-**oj** vrač.
by us be.PST.M.SG very good-M.SG dental-M.SG doctor
'We had a very good (female) dentist.' [Russian] (Pesetsky 2013:38)

[41] The empirical evidence supporting the notion that singular might behave differently in Russian comes 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.

(107) Agreement with lower adjective *zubn-**oj*** 'dental' (grammatical gender):



After the derivation in (107), the adjective *zubnoj* 'dental' has acquired the grammatical masculine gender and singular number. At this point, the higher, later merged adjective *xoroš-**oj*** 'good', still has a choice in agreeing either in grammatical or natural gender, as evinced by (105). The resulting pattern will depend on the order of Agree operations that obtains on the higher adjectival probes. As is probably obvious by this point, maintaining the Number Agree > Gender Agree on the higher Adj will yield the same grammatical gender pattern, while Gender Agree > Number Agree will yield natural gender agreement.

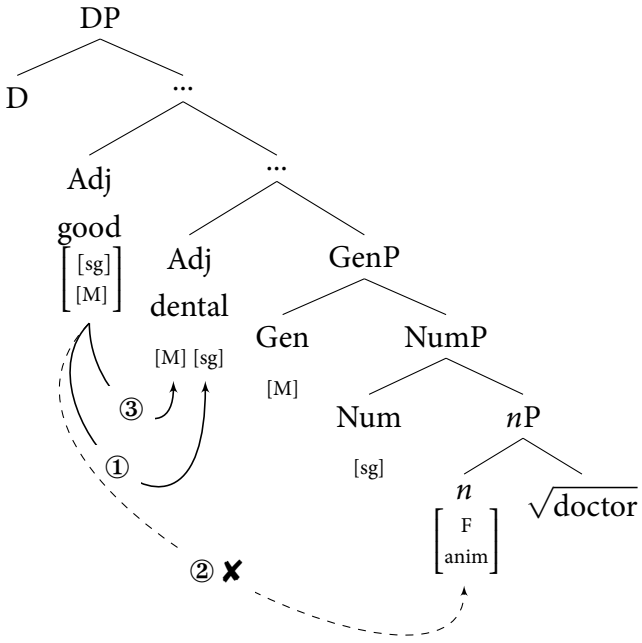
The first option will derive (108), where grammatical gender agreement holds throughout the DP. The adjective that merges on top of our now grammatical masculine 'dental' in (105a) carries grammatical gender feature as well:

(108) U nas byl očen' xoroš-**oj** zubn-**oj** vrač.
by us be.PST.M.SG very good-M.SG dental-M.SG doctor
'We had a very good (female) dentist.' [Russian] (Pesetsky 2013:38)

The number probe in this case finds its goal [#:sg] on the lower adjective, establishing the Agree domain. The subsequent gender probe cannot search any deeper than the head already targeted and thus it targets the grammatical masculine [M] feature on the lower adjective as well.[42]

[42] As in previous derivations, gender agreement will actually involve two cycles. First the [$*\gamma$:□[anim:□]$*$] probe will try to find natural gender, but once it fails, it will be reduced to [$*\gamma$:□$*$], which will find the grammatical gender [F] feature on the Adj.

(109) Agreement with higher adjective *xoroš-**oj*** 'good' (grammatical gender)

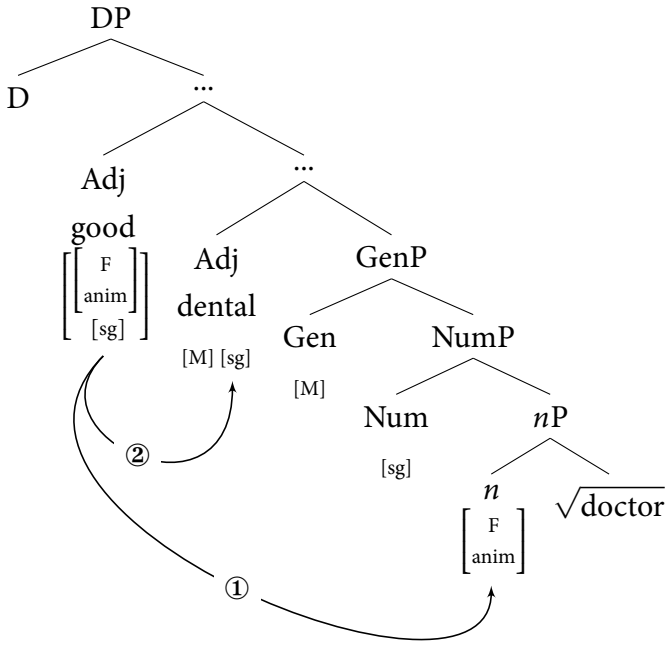


Maintaining the same order of Agree operations is then what derives the matching case in (108). What we still need to account for is the possibility for the higher adjective to have mismatching features, as in (101b), repeated in (110).

(110) U nas byl-**a** očen' xoroš-**aja** zubn-**oj** vrač.
by us be.PST-F.SG very good-F.SG dental-M.SG doctor
'We had a very good (female) dentist.' [Russian] (Pesetsky 2013:38)

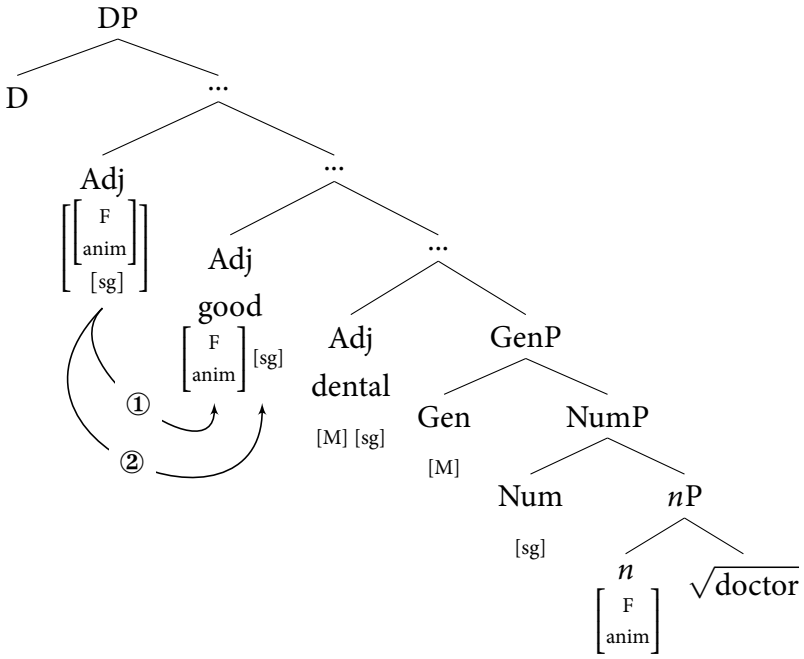
In by now already predictable fashion, this pattern, with natural feminine gender agreement on the higher adjective, can be derived if the order of operations on the higher adjective, *xorošaja* 'good.f' is reversed. The first potential goal that Gender Agree finds, the lower adjective *zubnoj* 'dental' has only the unsatisfactory grammatical [M] gender. The probe thus continues the search (also past Gen, with the same dispreferred feature) until it finds the matching natural gender [F[anim]] on *n*. Number Agree will afterwards find its closest valued goal on the lower adjective, without the need to search all the way to Num.

(111) Agreement with higher adjective xoroš-**aja** 'good' (natural gender)



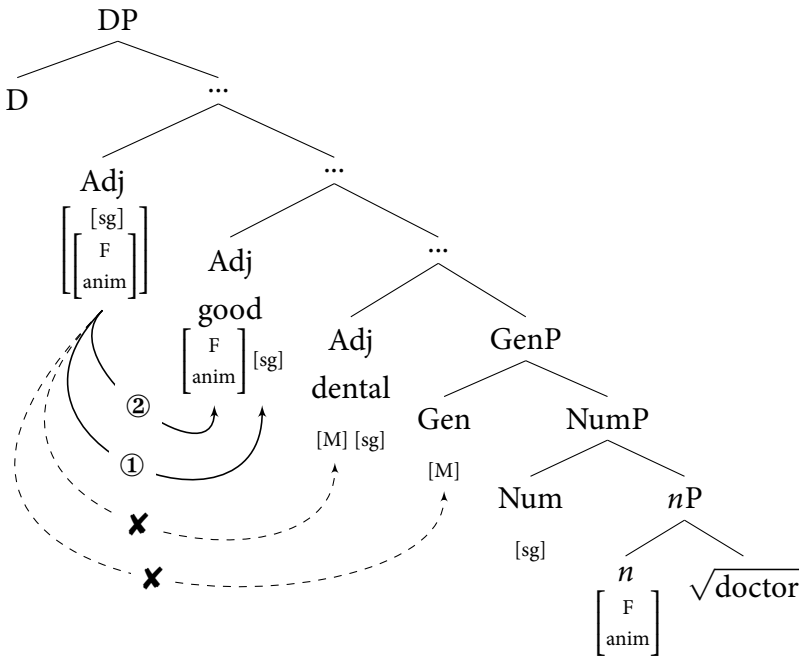
A major advantage of this approach is that it derives the Agreement Restrictions in the nominal domain for free. Once the natural gender is copied onto the higher adjective *xorošaja* 'good.f', any subsequently merged probe (another nominal modifier, or the predicate) will only be able to target the natural gender and the number feature present on the highest adjective. As a result, at this point the order of Agree operations does not matter, as any order will yield the same result – namely, the restriction to natural gender agreement. Thus if Gender Agree is performed before Number Agree, as in (112), the more complex feature on the closest Adj will be copied, together with the number feature from the same element, resulting in natural feminine gender agreement.

(112) Agreement with higher adjective (Gender Agree > Number Agree ⇒ natural gender)



Even if the order of operations is reversed on the higher adjective, and Number Agree precedes Gender Agree, we will get natural gender agreement as a result, simply because the more complex and preferred feature is now high enough, while the both the (dispreferred) grammatical gender features are too low to be found by the gender probe.

(113) Agreement with higher adjective (Number Agree > Gender Agree ⇒ natural gender)



Any later probe will not be able to access the grammatical gender any more, under any order of operations, as the natural gender on the higher adjective will be the closer one. The system therefore derives interactions between nominal modifiers in exactly the same way, with exactly the same results, as the interactions between nominal modifiers and predicates (e.g. in (90) above). This enables creating a unified account that applies to every agreement target in the same fashion. It also relies on a very simple result, once a more complex feature is in a high position in the structure, it cannot be ignored by Agree. This comes as a conspiracy of two factors: the complexity of the feature and the fact that this is the highest available feature for any gender probe.

3.2.2.1 On the preference for grammatical gender on lower adjectives

In the previous section, grammatical gender agreement on the lower adjective and natural gender agreement on the higher one was derived as a logical possibility that Russian has at its disposal. However, as observed by Crockett (1976:96) and Pesetsky (2013:37) i.a., and pointed out briefly in footnote 39 above, agreement in grammatical gender on the lower adjectives is not always just an option, sometimes it is in fact a norm. With the nouns with under-specified, discourse-dependent natural gender, agreement in natural gender is almost never instantiated on adjectives that tend to appear lower in the structure, such as the ones that have non-restrictive, i.e. 'nonintersective, idiomatic or argumental interpretation' (Pesetsky 2013:37). Thus for the phrases *glavnyj vrač* 'head doctor', *klasnyj rukovoditel'* 'class supervisor' and *priiskovyj sčetovod* in (114), Crockett (1976:96) claims that the adjectives are simply kind or reference modifiers, but they do not apply to the actual discourse referent.

(114) a. Glavn-**yj**/*Glavn-**aja** vrač poliklinik-i skazal-a, čtoby...
head-M.SG/*head-F.SG doctor clinic-GEN.SG said-F.SG that...
'The (female) head doctor of the clinic ordered that...'

b. Klassn-**yj**/*Klassn-**aja** rukovoditel' soobščil-a Česnokovu, čto...
class-M.SG/*class-F.SG supervisor informed-F.SG Chesnokov that
'The (female) class supervisor informed Chesnokov that...'

c. Priiskov-**yj**/*Priiskov-**aja** sčetovod ser'ëzno zabolel-a.
mine-M.SG/*mine-F.SG accountant seriously took-ill-F.SG
'The (female) mine accountant took seriously ill.' (Crockett 1976:96)

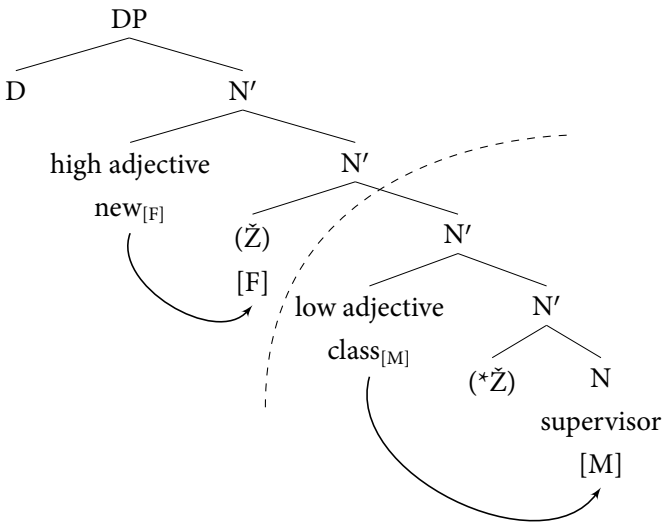
d. U nas byl-**a** očen' xoroš-**aja** zubn-**oj** vrač.
by us be.PST-F.SG very good-F.SG dental-M.SG doctor
'We had a very good (female) dentist.' (Pesetsky 2013:38)

The agreement facts from (114) above lead Pesetsky (2013) to propose that adjectives can merge at different heights within the DP. Taking (114d) as an example, since restrictive (kind) adjectives are closer to the noun than the non-restrictive ones, Pesetsky assumes they are merged lower in the structure. Moreover, as they can only show grammatical gender agreement, his

assumption is that grammatical gender is the only one they can access, which consequently means that grammatical gender must also be coded relatively low. In his system, it is hosted by N. Kind adjectives are then assumed not to be able to target natural gender because there are no such features in their search domain. Natural gender features are (optionally) introduced higher in the structure, by a 'feminizing head' marked as Ž 'zhe' (the label symbolising the feminine gender in Russian). By assumption, restrictive adjectives are merged above the feminizing head. As a consequence, feminine natural gender feature is always going to be the closest potential goal for the higher adjectives if the feminizing head is present.

In sum, Pesetsky (2013) analyses the 'gender switch' by means of optional introduction of natural gender features by a special designated functional head (whose only purpose in the grammar is just to introduce this feature, only with this particular type of nouns). This natural gender then overrides the grammatical gender of the noun, by being the closer goal for all gender probes above it. This idea is schematised in (115). As seen in the tree, the Ž head 'can be merged at any point above a certain structural threshold' (Pesetsky 2013:39) and non-restrictive adjectives are merged below this threshold. Any adjectives below it will show grammatical masculine agreement, while any adjectives above it will agree in natural feminine gender.

(115) Deriving agreement mismatches (Pesetsky 2013:40)



It is worth noting at this point that the empirical picture that Pesetsky (2013) bases his analysis on is not completely clear in Russian. Ideally, the patterns should be tested in an experimental setting in order to establish how acceptable and how robust the patterns are among contemporary Russian speakers.

While an account along these lines would give positive results for Russian hybrid nouns (as indeed outlined by Pesetsky 2013), applying this line of thinking to BCS hybrid nouns would yield undesirable results. With BCS split hybrid nouns we observed a pattern where in the plural it is possible to get alternations between natural masculine and grammatical feminine gender agreement. Masculine is the obligatory option in the singular, though, so it is not correct to say that this gender is only added to the noun based on the discourse referent. It seems that masculine is indeed a core property of this noun, at least in the singular. From these facts it also follows that an alternative analysis, one which would treat masculine as a core property in the singular, but a discourse property in the plural, is clearly undesirable.

Nevertheless if, for the sake of argument, we assume that grammatical gender is lower on the NP, while the natural gender is higher, two predictions follow: 1) non-restrictive adjectives should only agree in grammatical gender and 2) determiner-type elements and higher adjectives should be able to agree with the natural gender. These predictions are incorrect for BCS both for the singular and the plural. With nouns such as *zanatlija* 'artisan', non-restrictive adjectives agree in natural masculine in the singular, but in the plural they highly prefer the grammatical feminine.

(116) privatni zanatlija / *privatna zanatlija
private.M.SG artisan / private.F.SG artisan
'private artisan'

(117) privatne zanatlije / ??privatni zanatlije
private.F.PL artisans / private.M.PL artisans
'private artisans'

It seems, therefore, that non-restrictive adjectives are not exactly restricted to grammatical gender only, as they track one gender in the singular and another in the plural. Moreover, the second prediction foresees the situation in which, if the natural gender is introduced on a higher head, the lower adjective should agree in grammatical gender, while determiners should agree in natural gender. This situation does hold in the plural in BCS, but not in the singular (118).

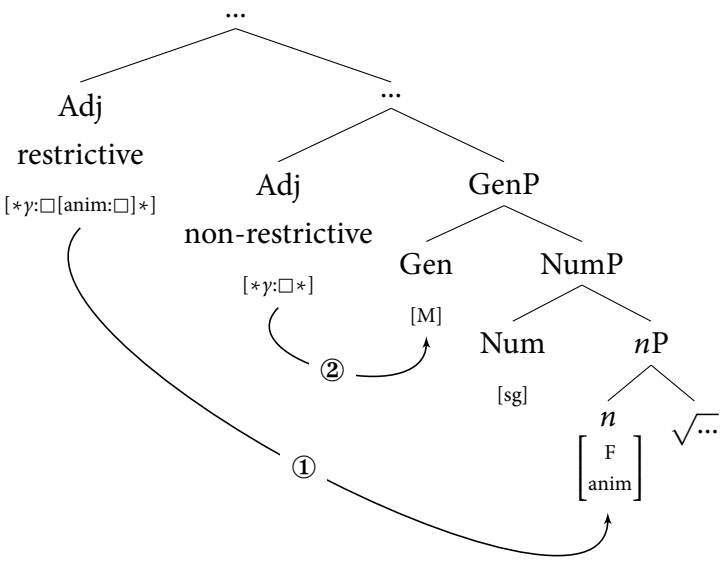
(118) *ovaj privatna zanatlija
this.M.SG private.F.SG artisan
'this private artisan'[43]

(119) ?ovi privatne zanatlije
this.M.PL private.F.PL artisans
'these private artisans'

The results in (118) and (119) indicate that the analysis above might potentially apply to the plural versions of the nouns, but it would fail to account for the singular. We would either be forced to say that the nouns have different gender specification in singular and plural (i.e. obligatory masculine in the singular and optionally added masculine in the plural), or that feminine agreement comes about as a result of some independent process (e.g. impoverishment of the masculine feature in the plural, cf. Despić 2017; Arsenijević 2016*b*).
While my account can derive the optionality and alternations in Russian, I propose that the restriction to grammatical gender agreement of the lower adjectives follows from the independent restrictions on the degree of articulation of the gender probe. In particular, I propose that adjectives merged lower in the structure have a tendency to probe only for grammatical gender features (cf. a similar suggestion for Russian by Smith 2017, fn. 19). This can be roughly schematised as in (120). Taking the noun of the *vrač*-type, natural feminine gender would be encoded on *n*, while the grammatical masculine gender is located at Gen. The lower adjective would only carry the simple [$*\gamma$:□$*$] probe, which will locate the closest matching goal on Gen. The higher adjective would carry the more complex probe, relativised for natural gender, which will enable it to skip both the lower adjective and Gen on its way to the preferred feature on *n*.

[43] This example can also be ruled out on independent grounds, namely because agreement in feminine gender is ungrammatical in the singular with these nouns. However, if we assume that the grammatical feminine gender is always present on them, ant that it must be hosted by N, and the natural masculine is introduced above, we would expect that a situation like this should in principle be available, since the lower adjective would copy the grammatical gender from N, while the demonstrative would copy the higher natural gender.

(120)



At this point, it is not clear why this should be the case, but pending further research, one possibility could be that this tendential property of non-restrictive adjectives came to be grammaticalised and integrated as a syntactic property of a simpler gender probe. On the other hand, under a Y-model of syntax, where the phonological and interpretative component are kept completely separate, ensuring that adjectives with a particular interpretation also admit only a particular kind of agreement is not a trivial task. This interesting interaction will be left for future research, ideally in the experimental setting.

Alternatively, we can follow Crockett (1976), who proposes that the structures [restrictive Adj + N] in Russian are actually lexicalised in the language to the point where the adjective can be treated as the initial part of a compound (Crockett 1976:101). Indeed the phrases *glavnyj vrač* 'head doctor', *klasnyj rukovoditel'* 'class supervisor' and *priiskovyj sčetovod* in (114) are already highly idiomatized in the language, and as Crockett (1976:101) claims '[t]he view of reference modifiers as components of composites is motivated by the semantic and syntactic cohesion of such modifiers with the nouns they modify'. I therefore adopt this preliminary solution, pending further research to account for the restrictions in grammatical gender agreement with Russian hybrid nouns.

3.3 Interim summary

In sum, the system developed in this part has shown to be powerful and restrictive enough to capture possible and rule out impossible mismatches in agreement. What was in common for all of the cases discussed is that Agree operations always have a preferred feature to target. If gender and number are valued on agreement targets by means of two separate Agree operations, interactions of these operations are expected, but they have certain consequences. Whenever the speaker gives primacy to copying gender features, there is a possibility that

some number information will be lost. Conversely, if number agreement is given the advantage, this derivational step might cause natural gender information to be inaccessible. The principle that is responsible for these restrictions, *The Condition on Agree Domains* plays a crucial role in deriving the Agreement Hierarchy effects – once a phrase has been targeted by one Agree operation, the following Agree operation has to be as economical as possible and apply within the same domain, doing the best to get its features valued. This is what excluded the return to grammatical agreement once semantic agreement was established. Finally, Agreement Hierarchy effects are derived as actual interactions between the Attributive and the Predicate element, which directly and straightforwardly captures the influence of attributive on predicate agreement.

In the following sections, I will attempt at a brief evaluation of how my proposal fares with respect to other approaches to Agreement Hierarchy effects. We will see that the BCS split hybrid nouns will ultimately be the problematic for all other approaches, as none of them are able to capture the split between the singular and the plural as they stand. Section 3.4.1 will address what I will refer to as 'configurational accounts', i.e. accounts that explain mixed agreement patterns by optional addition of semantic features higher in the structure than the formal ones, introducing thereby a switch to natural gender agreement. Such analyses were proposed by Steriopolo and Wiltschko (2010), Pesetsky (2013) and Landau (2016). Another line of argumentation holds interpretability of features responsible for mismatches. Such proposals of Smith (2015, 2017) and Wurmbrand (2016, 2017) will be scrutinised in Section 3.4.2.

3.4 Previous accounts

3.4.1 Configurational accounts

Proposals for deriving Agreement Hierarchy effects by Steriopolo and Wiltschko (2010), Pesetsky (2013) and Landau (2016) are mostly based on a similar idea – grammatical gender is the inherent gender of the noun, present low in the structure as a piece of lexical information that makes up a part of the noun's stem. Natural gender can be optionally introduced higher in the DP structure, and if it is present, it becomes the minimally closest goal for any probe merged afterwards. Such accounts essentially take natural gender to be an optional property of the noun, which is why they have difficulty extending to BCS split hybrid nouns, where natural gender is a noun's obligatory property.

3.4.1.1 Steriopolo and Wiltschko (2010)

Steriopolo and Wiltschko (2010:157) discuss hybrid nouns in Russian and propose that gender features can be distributed along three possible positions in the DP. Natural gender is located on the root, grammatical gender is introduced by *n*, while an additional type, D(iscourse)-gender, is introduced by D. A noun with natural masculine gender, like *otʹěc* 'father', only

has the root-gender (121a). A noun with grammatical gender, such as *čelověk* 'person' has no natural gender on the root, but it receives its grammatical gender from *n* (121b). Gender variable nouns, such as *s'irotá* 'orphan', receive either masculine or feminine gender based on the gender of the discourse referent, and this feature is located in D (121c).

(121) a. $[_{DP}\ D\ [_{nP}\ n\ \sqrt{ot'éc}_{[m]}\ ]]$
b. $[_{DP}\ D\ [_{nP_{[m]}}\ n_{[m]}\ \sqrt{č'elov'ék}\ ]]$
c. $[_{DP_{[m]}}\ D_{[m]}\ [_{nP}\ n\ \sqrt{sirota}\ ]]$ [Russian] (Steriopolo and Wiltschko 2010)

This account proposes that a higher gender can override the gender introduced by the lower functional projection. For instance, with hybrid nouns like *vrač* 'doctor' in Russian above, both grammatical (masculine) agreement and agreement according to discourse referent (feminine) are possible. Steriopolo and Wiltschko (2010) suggest that in the former case, such a noun only has grammatical gender on *n* (cf. (121b)), while in the latter, it has grammatical gender on *n* and D-gender, where the higher one overrides the lower one by becoming the closer goal for verbal agreement.

This analysis faces a few challenges, most of which are discussed by Matushansky (2013), to whose account I direct the interested reader. What is of interest to us here is that this system cannot account for adjectival agreement, and consequently, not for Agreement Hierarchy effects either. If a hybrid noun can trigger either masculine or feminine agreement on the adjective, and grammatical gender is on *n*, while the discourse gender is on D, the question that is immediately raised is where the adjective should be merged in order to be able to access both projections for agreement (Matushansky 2013). This issue is not tackled in the paper. The same issues would arise if the account were to be extended to BCS. Assuming that a split hybrid noun like *komšija* 'neighbour' in BCS would have grammatical feminine gender on *n*P and discourse masculine gender on D, adjectival agreement would remain unexplained. Also, verbal agreement would always be expected to target the higher gender, in this case masculine, thus there would be no way to derive the possibility of gender agreement alternations in the plural. Therefore, I keep the insight from this paper that grammatical gender is present on a higher projection than the natural, but I do not follow this account further for its lack of crucial detail that would explain the BCS patterns.

3.4.1.2 Pesetsky (2013)

The basic intuition of the account proposed by Pesetsky (2013) has been outlined in Section 3.2.2.1 above. In this account, grammatical gender, as an inherent property of the noun, is hosted by N, while natural feminine gender is optionally introduced by a feminizing head Ž. With the *doctor*-type hybrid nouns in Russian, this means that N hosts the grammatical masculine gender, while Ž introduces the natural feminine. The 'switch' from grammatical agreement on lower probes to semantic agreement on higher probes is thus analysed by means

of optional introduction of natural gender features by a special designated functional head (which, as noted above, seems ad hoc, since its only purpose in the grammar is to introduce this feature, only with this particular type of nouns). The natural gender overrides the grammatical gender of the noun by being the closer goal for all gender probes above it.

Pesetsky (2013) utilizes the head that introduces natural feminine gender to derive Agreement Hierarchy effects in Russian. If this head is merged above the adjective, as in (122), this probe will only be able to access the grammatical masculine gender on N (cf. (115) above). However, any probe that merges above this projection, such as Part in (122), will have the natural gender as the closest one in its c-command domain.

(122) $[_{\text{PartP}}\ \text{Part}_{[\text{F}]} \ldots [_{\text{DP}}\ \text{D} \ldots [_{\ldots}\ \check{\text{Z}}_{[\text{F}]} \ldots [\ \text{Adj}_{[\text{M}]} \ldots [_{\text{NP}}\ \textit{vrač}_{[\text{M}]}\ ]]]]$

② ①

The same principle applies DP-internally as well, as seen in (115) above. Since Ž can optionally merge between two adjectives, the lower one (Adj1) will agree with N in grammatical masculine gender, while the higher one (Adj2) will agree with the minimally closest natural gender:

(123) $[_{\text{PartP}}\ \text{Part} \ldots [_{\text{DP}}\ \text{D} \ldots [_{\ldots}\ \text{Adj2}_{[\text{F}]}\ [_{\ldots}\ \check{\text{Z}}_{[\text{F}]} \ldots [\ \text{Adj1}_{[\text{M}]} \ldots [_{\text{NP}}\ \textit{vrač}_{[\text{M}]}\ ]]]]$

② ①

Even though successful in accounting for Russian, one of the main reasons for not following this account in my analysis is that it yields incorrect results with the BCS split hybrid nouns of the *bishop*-type. The reasons for this are rather simple. The obligatoriness of natural gender agreement in the singular with these nouns would imply that the phrase carrying the natural gender should not be optional, as in Pesetsky's system, but rather it should be present on the noun at all times (as also argued in Section 3.2.2.1). Furthermore, if the natural-gender bearing phrase is always present and it is located above the grammatical gender, we would have no way of deriving optionality in the plural. The access to grammatical gender by higher adjectives and verbal probes would always be blocked, since the grammatical gender lower on N would be overwritten by the higher natural gender on the gender-bearing phrase, which would always be the closest potential goal. We would thus have to say that the natural-gender-bearing phrase is obligatorily present in the singular and optionally present in the plural, which seems to be merely a restatement of the facts. In the next section, we will see how the account of Landau (2016) fails to apply to BCS for the same reasons.

3.4.1.3 Landau (2016)

Landau (2016) presents another recent account that deals with agreement with hybrid nouns, tackling primarily number agreement mismatches in Hebrew. I will provide a brief discussion of the main proposal, together with a claim that it should be refuted for BCS for the same

reasons as the account of Pesetsky (2013), while the derivation of the mismatches in Hebrew under my account will be the topic of Section 4.2.1.

The Hebrew noun *ba'al* 'husband' or 'owner', triggers masculine singular agreement when it has singular number, while its plural form (*be'alim*) can trigger either singular or plural agreement on the adjective and the verb.

(124) a. ha-be'al-im ha-kodem maxar et ha-makom lifney šana.
the-owner-PL the-previous.SG sold.3.SG ACC the-place before year
'The previous owner sold the place a year ago.'

b. ha-be'al-im ha-kodm-im maxru et ha-makom lifney šana.
the-owner-PL the-previous-PL sold.3.PL ACC the-place before year
'The previous owners sold the place a year ago.'

c. ha-be'al-im ha-kodm-im maxar et ha-makom lifney šana.
the-owner-PL the-previous-PL sold.3.SG ACC the-place before year
'The previous owner sold the place a year ago.' (Landau 2016:984f.)

Landau (2016) claims that the noun, even though formally plural, is semantically compatible with either singular or plural referent. Mismatches between adjectival and verbal agreement are also possible, as in (124c) and these mismatches reflect the Agreement Hierarchy restrictions. While it is acceptable to have grammatical plural number on the adjective and natural singular number on the verb, the opposite combination is ungrammatical.

Although this (minimalist) analysis makes crucial use of HPSG terminology and treatment of lexical items and their features (i.e. the index and concord distinction by Wechsler and Zlatić 2003), I will simply refer to the plural as formal number, as opposed to the singular semantic number. The formal plural number feature of *be'alim* is specified on N, while the semantic number feature is located on NumP. Different agreement patterns are then claimed to be the result of different positions in which NumP is merged within the DP, i.e. either below or above the adjective's base position:[44]

(125) $[_{DP}\ D \ldots [_{NumP}\ Num_{[index:\ sg/pl]} \ldots [\ Adj_{[concord:\ m,pl]} \ldots [_{NP}\ \textit{be'alim}_{[concord:\ m,pl]}\ ]]]]$
(① Adj → be'alim)

(126) $[_{DP}\ D \ldots [\ Adj_{[index:\ sg/pl]} \ldots [_{NumP}\ Num_{[index:\ sg/pl]}\ [_{NP}\ \textit{be'alim}_{[concord:\ m,pl]}\ ]]]]$
(① Adj → Num)

If NumP is merged above the Adj, the only feature available for the adjective to agree with is the concord plural feature on N (125). This configuration will result in plural agreement on the adjective (124b)–(124c). If NumP is merged below the adjective (126), the index number feature on NumP will be the closer goal for adjectival agreement, resulting in singular agree-

[44] Landau (2016) remains agnostic on where this position actually is, as all that is necessary for the account is that it is somewhere between NP and DP. However, he offers evidence from mixed adjectival agreement with numerals and some hybrid nouns from Chichewa, Hebrew, Finnish, Lebanese Arabic and Russian to corroborate the idea that NumP and adjectives can take different positions with respect to one another. See Landau (2016) for further detail.

ment (124a). Verbal agreement will always target the higher semantic number feature, located on NumP.

Extending the system to mixed agreement with Russian nouns such as *vrač* 'doctor', Landau (2016) proposes that such a noun has masculine grammatical gender encoded on N as a lexical feature (cf. Pesetsky 2013), while it can optionally have feminine or masculine natural gender as a semantic feature on NumP (following Ritter 1993).[45] The position of NumP with natural gender feature would thus determine whether the adjective agrees with the grammatical gender on the NP (when NumP is merged higher than the adjective) or with natural gender (when NumP is merged lower). The verb would always agree with the higher gender, again like in the Pesetsky (2013) system.

When applied to nouns with natural masculine and grammatical feminine gender, like *vladika* 'bishop' in BCS, this analysis yields incorrect results. Under this account, a split hybrid noun of this type would always need to have grammatical feminine gender lower on NP, as this is the lexical gender feature on the noun. Natural masculine gender would be encoded on NumP. The verb would always target the higher masculine gender on NumP, which is the correct outcome only in the singular (in the plural, the verb shows mixed agreement). Furthermore assuming that NumP can take different positions relative to the adjective, it is predicted that adjectives should be able to show either feminine agreement (if NP is targeted, as in (127)), or masculine agreement (if masculine on NumP is targeted (128)). This is contrary to fact, as the only agreement allowed in the singular is masculine.

(127) $[_{\text{DP}}\ \text{D} \ldots [_{\text{NumP}}\ \text{Num}_{[\text{index:m,sg}]} \ldots [\ \underbrace{\text{Adj}_{[\text{concord:f}]} \ldots [_{\text{NP}}\ \text{N}_{[\text{concord:f}]}}_{①}\ ]]]]$

(128) $[_{\text{DP}}\ \text{D} \ldots [\ \underbrace{\text{Adj}_{[\text{index:m,sg}]} \ldots [_{\text{NumP}}\ \text{Num}_{[\text{index:m,sg}]}}_{①}\ [_{\text{NP}}\ \text{N}_{[\text{concord:f}]}\ ]]]]$

The configurational approach proposed by Landau (2016) thus cannot accommodate the BCS data, as any proposed configuration yields incorrect results in the singular. In the plural, the picture might look more promising, because the possibility of the NumP to assume different positions is what we need to derive optionality. Yet, under this account we would never be able to derive the fact that the verb can target the grammatical feminine gender, as it is always lower in the structure and the higher natural gender is more accessible to the verb.

This proves once again that configurational accounts are not the best means to analyse the mixed agreement patterns in BCS. Overriding one type of gender with another one makes the lower gender inaccessible for higher probes, but as we have seen, this does not always yield the correct result. In that respect, relativized probing enables much more flexibility and accuracy in deriving both the restrictions and optionality.

[45] See Kramer (2009, 2015*b*) for arguments against locating gender on NumP.

3.4.2 Mixed agreement by feature interpretebility

Recent accounts by Smith (2015, 2017) and Wurmbrand (2016, 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 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. I argue that such assumptions prove unsuccessful at deriving agreement patterns with BCS split hybrid nouns. 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.

3.4.2.1 Smith (2017)

Smith (2015, 2017) assumes that Agree is performed in two steps: (i) Agree-Link, which is triggered by unvalued ϕ-features on the probe, and which creates a link between the probe and the goal, performing all its tasks in narrow syntax; and (ii) Agree-Copy, which copies the ϕ-features linked by Agree-Link from the goal onto the probe (cf. Arregi and Nevins 2012). While Agree-Copy applies at Transfer (or even at PF), Agree-Link happens as early as possible in the derivation, as soon as there is a c-command relationship between a probe and a goal.

As for features, *u*Fs are always active for agreement by default. However, this is not the case with *i*Fs, which can be either *active* or *inactive* for agreement. They can only participate in agreement if they are *active*. An important principle proposed by Smith is that if an *active* interpretable feature exists on the NP, Agree-Link cannot ignore it. Moreover, if an *active* *i*F is matched by Agree-Link, it can optionally be deactivated. As a consequence, if the feature is deactivated, it will not be visible to later Agree-Link operations (by different probes communicating with the same NP). If it is not deactivated, it can participate in later Agree operations again.

The basic analysis of Smith (2015, 2017) then functions by means of the following mechanics: Agree-Link from Probe 1 applies as soon as possible and establishes a link with the active *i*F on the goal (if such a feature exists on the goal; if not, Agree-Link will match an *u*F, but crucially, it will never match an *inactive* *i*F). If this *i*F is not deactivated in this process, it can be matched by another probe later in the derivation as well. If, on the other hand, it is deactivated, another probe later in the derivation can only establish Agree-Link with a *u*F present on the goal. The final important assumption is that adjectives are late-adjoined

(Stepanov 2001), which means that they are introduced into the structure later than T (which is assumed to mediate verbal agreement).

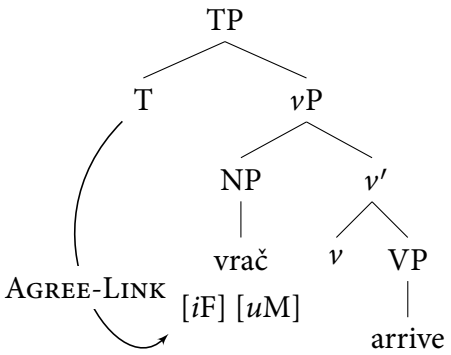
With the assumptions above, Smith (2015, 2017) mostly focuses on explaining the hybrid agreement patterns with the *committee*-type nouns in English, but he does offer a suggestion for an analysis of the Russian patterns such as the ones in (129).

(129) a. Novyj vrač prišël/prišla.
new.M.SG doctor arrived.M.SG/arrived.F.SG
'The new (female) doctor arrived.'

b. Novaja vrač prišla/*prišël.
new.F.SG doctor arrived.F.SG/arrived.M.SG
'Our (female) doctor arrived.' (Russian, Pesetsky 2013:36)

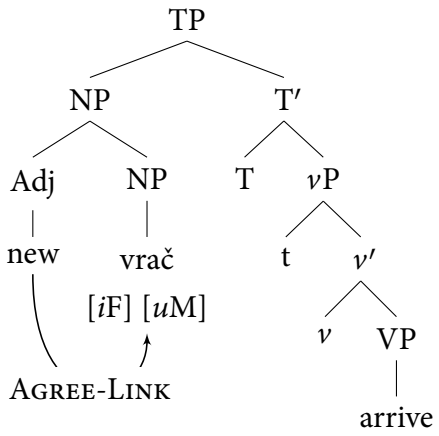
The *vrač*-type nouns are assumed to have uninterpretable masculine gender [*u*M] and interpretable feminine gender [*i*F]. In order to derive the mismatches and the possibility of feminine agreement, the [*i*F] feature must be assumed to be *active*. The hybrid noun is initially merged as a specifier to *v*P. As soon as T is merged, Agree-Link is established.

(130) Step 1 (Smith 2017):



Agree-Link therefore creates a link to the noun's active [*i*F] feature. This feature may or may not be deactivated by this operation. In the following derivational step, the adjective is merged counter-cyclically after the NP's movement to the subject position. Agree-Link is established again between the adjective and the NP, as in (131):

(131) Step 2 (Smith 2017):



Two scenarios are possible as a result of this step, both of which hinge on the activity of the interpretable feminine feature. If the active [*i*F] feature has not been deactivated by the previous Agree-Link with T, Agree-Link triggered by the adjective will be able to match the interpretable feminine feature as well. This derives the pattern where both the verb and the adjective bear the interpretable natural feminine gender:

(132) Novaja vrač prišla.
new.F.SG doctor arrived.F.SG
'Our (female) doctor arrived.' (Russian, Pesetsky 2013:36)

If, on the other hand, the [*i*F] feature has been deactivated by the previous Agree-Link with T in Step 1 (130), Agree-Link performed by the adjective will only be able to match the uninterpretable masculine gender feature [*u*M]. This is how a mismatch between adjectival and verbal agreement is derived.

(133) Novyj vrač prišla.
new.M.SG doctor arrived.F.SG
'The new (female) doctor arrived.' (Russian, Pesetsky 2013:36)

Finally, if the [*i*F] gender feature on the NP is not active at all, T will only be able to copy the [*u*M] gender feature (Smith 2015:234). This scenario derives the most basic case in Russian, where both the verb and the adjective agree in grammatical gender:

(134) Novyj vrač prišël.
new.M.SG doctor arrived.M.SG
'The new (female) doctor arrived.' (Russian, Pesetsky 2013:36)

The situation in which the uninterpretable [*u*M] feature is copied by T, while the active [*i*F] is accessed later by the adjective is excluded by the system, deriving the correct results for the patterns discussed by Smith (2015, 2017). This excludes semantic agreement on the adjective and grammatical agreement on T, as per Agreement Hierarchy.

The late adjunction and interpretability of features are two crucial assumptions that enable this account to derive Agreement Hierarchy effects. As for the first, Smith (2017) himself acknowledges that it is controversial, but as my account has shown above, it is in fact not necessary in order to derive the mismatches. The same successful results can be achieved if adjectives are adjoined in syntax, in the order in which they appear in the sentence in all languages discussed by Smith (see Section 4.1.1 for an analysis of Chichewa and 4.2.1 for Hebrew). More importantly, if applied to BCS data, the system with interpretable vs. uninterpretable features turns out not to be the most optimal one. In order to accommodate the patterns found in BCS, it would have to be assumed that a noun such as the BCS split hybrid noun (one with natural masculine agreement in the singular and mixed agreement in the plural) has both an interpretable masculine [*i*M] and an uninterpretable feminine [*u*F] feature encoded on the lexical entry. We would also have to assume that the interpretable [*i*M] is *always active* in the singular, while in the plural it can be optionally deactivated. It may be completely inactive (where we would get agreement with the uninterpretable [*u*F] feminine gender throughout). On the other hand, it may also be active in the plural, in which case we could be able to get mixed agreement patterns just like in Russian above.
Alternatively, it might be assumed that the uninterpretable feminine feature appears only in the context of plural number. This option again would not be on the right track. First, it would be strange to say there is no uninterpretable gender feature at all in the singular, since uninterpretable features are by default assumed to be present on nouns that have grammatical gender. Second, grammatical feminine features participate in PF processes (such a noun behaves like a feminine noun for the purposes of affixation and declension patterns in general), and it would be important for exponence to have this feature available on the PF side even in the singular.[46]

3.4.2.2 Wurmbrand (2017)

The system of Wurmbrand (2017) crucially relies on the assumption that the DPs that trigger mixed agreement patterns have to be specified for two different types of features - interpretable and uninterpretable features. Both types of features are present on the DP in the syntax, but they are sent to different interfaces at Spell-Out. Interpretable features feed to LF, while uninterpretable ones feed to PF (cf. Smith 2015, 2017). Agreement proceeds via the operation Agree on all agreement targets. This operation has the opportunity to copy any of the two types of features (either the interpretable or the uninterpretable ones), and which of them have participated in Agree is revealed in the surface form of the agreement target. Since this optionality needs to be restricted somehow, Wurmbrand (2017) suggests that the restrictions come from

[46] Admittedly, one point that Smith's account explains very well is the c-command condition on semantic agreement. Based on the ungrammaticality of examples such as **There are a committee...*, Smith (2015) argues that in order for semantic agreement to be possible, the hybrid controller needs to c-command the agreement target, overtly or covertly. Since my account has yet to address the influence of movement on hybrid agreement, I leave this issue as a part of the future research agenda.

the type of feature that the agreement target actually needs.

Since this account is dedicated to deriving the possibilities of agreement for individual agreement targets, but not to the interaction of targets in two places in the hierarchy, it does not have much to say about Agreement Restrictions. Wurmbrand (2017) proposes that those agreement targets show only grammatical, i.e. formal agreement require only *uninterpretable* Fs, while those that agree in semantic features always agree in *interpretable* features. But since agreement controllers themselves can contain both *i*Fs and *u* certain matching conditions force, for instance an attributive modifier to temporarily deactivate the interpretable feature of the controller and copy the uninterpretable one, while the predicate would copy the interpretable, i.e. the semantic one. Crucially, deactivation of features applies for every probe, thus if a feature can be deactivated for an adjective but then 'reactivated' for agreement with a predicate.

However, what restricts the deactivation in a single slot in the hierarchy is not clear from this account, nor is it clear how to capture the optionality that predicates show in BCS. A certain type of feature may be temporarily made 'invisible' or inaccessible for agreement with one probe, but made available again for another probe. However, while in my account this inaccessibility comes from well defined principles, in the account of Wurmbrand (2017) it is only stipulated. Moreover, this account, as already mentioned, is not restrictive enough to account for Agreement Restrictions. Assuming that adjectives and participles in BCS may copy either interpretable or uninterpretable features from a hybrid agreement controller, nothing prevents the deactivation of the uninterpretable gender for the adjectival agreement (which results in natural gender valuation) followed by deactivation of the interpretable gender for verbal agreement (which results in grammatical gender valuation), predicting incorrectly that natural gender agreement on the adjective and grammatical gender agreement on the verb should be a valid option.

Chapter 4

The loci of parametric variation

The agreement mechanism developed so far has proven successful not only in deriving hybrid patterns in gender agreement, but also in restricting them such that they abide by the Agreement Hierarchy. As the patterns we have examined mostly came from Slavic languages, in particular from agreement with nouns of dual gender, a legitimate question to ask is whether the account can be extended to Agreement Hierarchy effects recorded in other languages, and if yes, how. Moreover, in a system designed to account for exceptional agreement patterns, the regular or canonical patterns should be trivially derivable. These two issues are the main topic of the discussion in this chapter.

Looking at the complete system, the likely candidates for the cause of parametric variation across and within different languages are (i) the manner and the degree of articulation of ϕ-probes, (ii) the structure and hierarchical organisation of ϕ-features and (iii) the order of application of Agree operations. On the other hand, what must be kept constant is the structure of the DP, in the sense of the position of natural and grammatical gender (and number) features. An additional constant is the Condition on Agree Domains, which should hold universally.

In the sections to follow, we will first explore how the different ways and degrees of articulation of the probe can lead to interesting predictions and correct results. An exploration of Chichewa in Section 4.1.1 will reveal that the gender probe can be relativized for the feature [human] instead of [animate]. Moreover, Section 4.1.2 will demonstrate that even within a single language, some probes (e.g. predicate) may be relativized for natural gender, while others (e.g. attributive) are satisfied by receiving only grammatical gender. The second factor, different feature structures, will be held responsible for deriving hybrid agreement in number, which is the topic of Section 4.2. The third factor in variation, the order of Agree operations, will be explored in more detail in the third part of the dissertation, in the discussion of Predicate Hierarchy effects.

4.1 Parametrising the gender probe

4.1.1 Different ways of articulation of the gender probe: DP-internal mismatches in Chichewa

One more instance of mixed agreement patterns analyzed in connection to the Agreement Hierarchy comes from hybrid agreement in class features in the Bantu language Chichewa (Corbett 1991; Landau 2016; Smith 2017). Assuming that Bantu noun classes are instances of gender (Carstens 1991, 2008, 2011), we will see that the mismatches in Chichewa motivate the assumption that a gender probe can be relativized for features other than 'animate', namely 'human'. These mismatches will thus offer an avenue for an extension by revealing additional opportunities for deriving parametric variation in my system by different ways of articulating the gender probes.

In Bantu languages, nouns are categorised into classes and a noun's belonging to a certain class is reflected by the prefix it bears and agreement it triggers. Categorisation into classes is not based on the natural gender of the referent, but rather on certain semantic criteria that nouns of a particular class share. The noun *ngwazi* 'hero', belongs to class 9/10 in Chichewa.[47] Accordingly, it triggers class 9/10 agreement on all agreement targets. However, since this noun denotes a human animate referent, it can exceptionally pattern like other animate nouns, namely markers for class 1/2 can appear on agreement targets as well (135).

(135) a. ngwazi y-athu y-oyamba / ngwazi w-athu w-oyamba
hero 9-our 9-first / hero 1-our 1-first
'our first hero'

b. ngwazi y-athu w-oyamba
hero 9-our 1-first
'our first hero'

c. *ngwazi w-athu y-oyamba
hero 1-our 9-first
'our first hero' [Chichewa] (Corbett 1991:239)

Even though some Bantu languages can have as many as 20 noun classes according to traditional research, recent studies have pointed out certain similarities between such classes and gender, which allows for a drastic simplification of class systems and proposals for a unified analysis of Bantu-like class and Indo-European-like gender categories and their role in agreement (see also Corbett and Fedden 2016 for further evidence and discussion). In fact, drawing parallels between Bantu and Romance DPs, Carstens (1991, 2008, 2011) analyses noun classes in Bantu essentially as instances of genders (see also Corbett 1991; Kramer 2015*a*). Specifically, Carstens (2008) treats noun class as uninterpretable grammatical gender. She excludes natural gender as a possible type of gender in Bantu, since 'natural gender or sex is not a factor

[47] The class 9 marker appears in the singular, while class 10 marker is added in the plural, therefore the two classes are treated as instances of the same gender (Carstens 1991).

in determining the classes of nouns; rather, nouns denoting humans or, in many Bantu languages, animates, constitute a single Class Carstens (2008:133). This single class is usually the class 1/2 in Bantu, which contains most of the human animate nouns, and to which our noun *ngwazi* can optionally belong.

Carstens (1991, 2008, 2011) assumes gender to be the property of nominal stems and, accordingly, that a particular stem is compatible with a particular noun class. As pointed out by Kramer (2015*a*), the compatibility of stems and classes can be recast in terms of a $n+\sqrt{}$ analysis of the basic nominal structure. Kramer (2015*a*:252) proposes that roots of class 1/2 in Bantu are licensed under a nominalizer with the feature [human]. As for other classes, Kramer (2015*a*:253) tentatively assumes that they need to have some sort of a noun class identity feature, which can be thought of as a notational variant for gender.

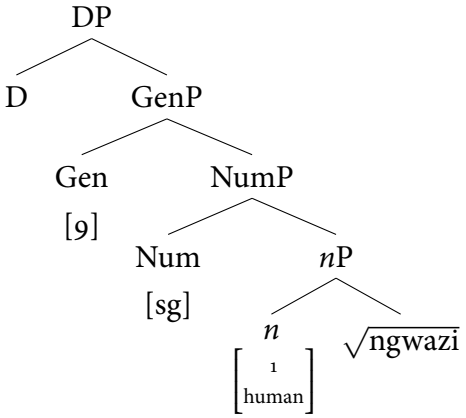
Combining the bits of the previous analyses, in order to account for the nominal structure in Bantu, I propose the following. Parallel to treating grammatical gender as being present on GenP, I assume that noun class features (i.e. grammatical gender features, as analysed by Carstens 1991, 2008, 2011) in Bantu are also encoded on a GenP. This option was indeed entertained as a possibility by Carstens (2008:136), fn. 6, but it was abandoned in favour of treating gender as an inherent feature of the stem. Since in my system, the equivalent of the stem is actually the nominal root, which does not contain any features, I continue assuming that all grammatical gender features are encoded on a functional projection GenP (as opposed to 'natural' features which are further down on *n*). I assume essentially the same architecture for Bantu DPs as the one assumed for Slavic above. GenP is projected above the NumP, which hosts number features in Bantu (Carstens 1991, 2008, 2011). The class-marking prefix realises the two features together, as a result of fusion of these two projections into a single node (cf. Carstens 2008, following Halle and Marantz 1993). Finally, I adopt Kramer's (2015*a*:252) proposal that the *n* of Bantu class 1/2 nouns encodes the feature [human]. For all other classes, I assume that their GenP only contains the class identity features, i.e. gender features that I will mark by numerals [1,3,5, etc.] (Kramer 2015*a*; Carstens 1991, 2011).

In the remainder of the section, for the sake of familiarity, I will continue referring to Chichewa class features as gender features. I assume that the architecture of the features is the same, such that features are organised in a hierarchical manner like in Slavic before. Grammatical gender features will then just be specified as [1/2/3...]. Since the noun such as *ngwazi* 'hero' teaches us that an equivalent of natural gender, i.e. semantic gender, can also be found in Bantu, I propose that such gender is represented with an additional node in the feature hierarchy, namely [human] in Chichewa (as opposed to 'animate' present in Slavic). Therefore, the natural gender feature can be present as a combination of gender and human-ness, equivalent to the combination of gender and animacy we have had before: [*γ*:1 [human]].

Applying the assumptions to the Chichewa noun *ngwazi* 'hero', I propose that this noun has the gender (i.e. noun class identity feature) [9] encoded on the GenP. Below it, the singular number feature [#:sg] is present on the NumP. This structure predicts that similar alternations

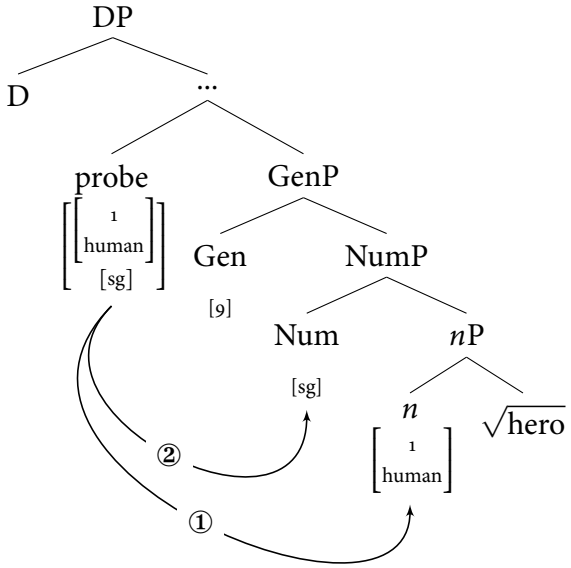
should be possible in the plural as well. Due to the lack of data in the literature that would confirm this prediction, I leave this issue to future research. In the syntax, they serve as two different goals for two Agree operations: Gender Agree and Number Agree. In the morphology, the two phrases are fused and realised as a single prefix. Furthermore, the *n* of this noun can optionally be specified for the natural gender feature [γ:1[human]]:

(136) *ngwazi* DP



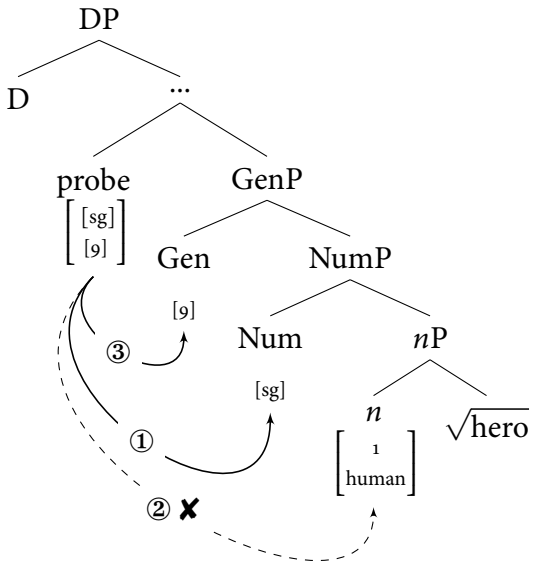
The agreement patterns are then derived as a result of the ordering of the two Agree operations. Let us illustrate them on abstract examples, before applying the system to agreement with possessives and quantifiers, which show mismatches in the Chichewa examples. Since natural gender agreement is a result of Gender Agree taking precedence, in order to derive semantic agreement with the natural [1] gender, we need to allow the gender probe to search for features first. In the same vein as in Slavic, I assume that the gender probe is relativized towards natural gender, which in this case means that it searches for a gender value combined with the feature [human]: [$*\gamma$:□[human:□]$*$]. A matching value is present on the *n*P. After the first Agree operation, the number probe finds the features on the higher Num head and copies them, obeying the CAD. The result is natural gender agreement, i.e. agreement in class 1:

(137) Natural gender:



The opposite order of probing yields grammatical gender agreement. As before, if the number probe has the Num head as its goal, this operation will delimit the search space for the following Gender Agree. The gender probe will then be valued by grammatical gender (139), yielding the sentence in (138).

(138) Grammatical gender:



The possibility of natural and grammatical gender agreement is then derived as a consequence of relativized probing, separate probing for number and gender and the Condition on Agree domains, as we have seen before with unrelated language families. The advantage of this approach is that the way to derive Agreement Hierarchy effects in Chichewa is exactly the same as in Slavic. What is different from Slavic is the word order of the nominal modifiers, which in this case follow the head noun. As (139) shows, the acceptable mismatch is the one in which

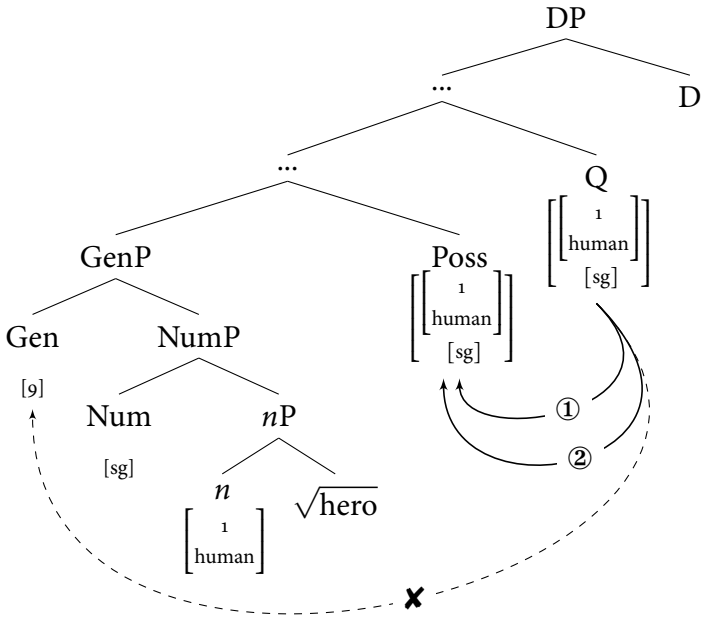
the closest modifier, the possessive, agrees in grammatical gender features, while the further and higher ordinal numeral agrees in natural gender features. The opposite scenario is not possible (139b).

(139) a. ngwazi y-athu w-oyamba
hero 9-our 1-first
'our first hero'

b. *ngwazi w-athu y-oyamba
hero 1-our 9-first
'our first hero' [Chichewa] (Corbett 1991:239)

The patterns can be derived if we assume that the linear order of the modifiers transparently reflects their Merge-sequence to the right of the noun. Thus if we assume that the abstract probe in (137) above is the possessive, and that it agrees in natural gender with *n*, this means that the possessive's gender features are valued by the more complex feature [1[human]]. This feature will be the closest available one for any higher probes, as in (140). I will treat the ordinal numeral simply as a quantifier Q. Under any order of operations, it will find the number and the gender feature it needs on the first available goal - the possessive. This is how uniform natural gender agreement across modifiers is derived, but also how the impossible mismatch is excluded.

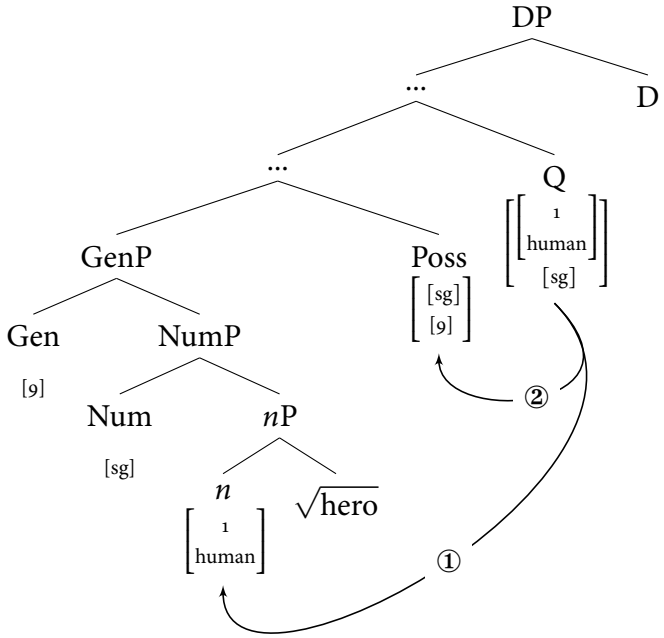
(140) Natural gender on higher modifier:



It therefore becomes impossible to copy grammatical [9] gender from the GenP once a modifier has copied natural gender features. On the other hand, if a modifier has copied grammatical gender as a result of its Agree operations, a higher modifier will still have an opportunity to choose. The acceptable mismatch in (139a) is generated when the possessor has agreed in

grammatical gender feature [9], but the quantifier probes for natural gender first. In this case, the gender probe from the higher modifier will skip the less complex gender feature that appears on the Poss and search all the way down to *n*P, while the number probe will copy the closest available number feature from Poss. The result is exactly the mismatch that is predicted and proven to be grammatical (141).

(141) Natural gender on higher modifier:



The analysis thus shows that, under the commonly accepted assumption that noun classes in Bantu are genders, mismatches between semantic and formal agreement can be captured as intervention effects for gender agreement caused by number features on the noun. Moreover, Agreement Hierarchy effects are once again simply a result of close interactions of Agree operations. Projecting a grammatical gender feature on a nominal modifier leaves the more complex natural gender still visible and accessible to higher probes. However, projecting a natural gender feature to a nominal modifier is what introduces a 'switch' – once the more complex and preferred feature is high in the structure, it will always be the only logical choice for the subsequent probes.[48]

[48] A minor issue related to agreement in nominal modifiers might be posed by the recent account of Smith (2017). Building on work from Carstens (1991), Smith follows the assumption that in Bantu nominal modifiers are actually introduced to the left of the noun, just like in English, but the surface head-initial word order results from the subsequent movement of the N head to D. The detailed evaluation of the evidence for this sort of structure is beyond the scope of this dissertation. However, Carstens (1991) bases her claim on evidence from Kiswahili and not from Chichewa. When it comes to the basic nominal structure in this language, Mchombo (2004:24) only observes that 'Chichewa is a strictly head-initial language. Within the noun phrase, the head noun precedes its complements.' without much further elaboration. In order then to be able to follow the analysis of Smith (2017), more data from Chichewa are necessary. Therefore, I propose my analysis as a possible analytical option, which might require further evidence to support it.

4.1.2 Different degrees of articulation of the gender probe: Enforcing a cut-off point

The empirical evidence for the existence of the Agreement Hierarchy in Section 2 revealed that even though different languages can allow for hybrid agreement effects, they differ in exactly which slots of the hierarchy may, or must, show formal or semantic agreement. The point up to which grammatical agreement is the norm, but after which semantic agreement is allowed was referred to as the 'cut-off' point. Languages such as German seem to be on the less permissive side when it comes to semantic agreement, as they only allow it on the far-right end of the hierarchy, namely on the personal pronoun. The cut-off point in German is therefore between the relative pronoun and personal pronoun slot. English was shown to have its cut-off point slightly further to the left – between the attributive and the predicate slot, while BCS and Russian do not seem to have one at all. The distinctions were summarised in Table 2.1, repeated in (142).

	attributive	predicate	relative pronoun	personal pronoun
German: *Mädchen*	N	N/A	N	N / F
English: *committee*	SG	SG/PL	SG/PL	SG/PL
BCS: *gazde* 'masters'	F / (M)	F / (M)	(F) / M	M

Table 4.1: Agreement Hierarchy (Corbett 1991:235)

In the following sections, we will explore the possibilities of deriving the cut-off points in different languages by different degree of articulation of probes. The guiding idea is that, while some probes look only for formal features, others chose to copy semantic ones from their targets.

4.1.2.1 Cut-off point between two slots in the hierarchy

As presented in Table 2.1 above, German can be taken as a clear instance of a language that expresses Agreement Hierarchy effects in terms of a strict distinction between the targets that must show formal agreement and those that can optionally agree in semantic features. A hybrid controller often discussed in the literature, the noun *das Mädchen* 'girl', triggers grammatical neuter agreement on all targets except for the personal pronoun, which can optionally agree in the semantic feminine gender of the noun (142)-(143).

(142) a. Das Mädchen, das ich gesehen habe...
the.N.SG girl.N.SG that.N.SG I seen have
'The girl that I saw...' (Corbett 1979:205)

b. *Das Mädchen, die ich gesehen habe...
the.N.SG girl.F.SG that.N.SG I seen have
'The girl that I saw...'

(143) a. Das Mädchen geniesst seinen Urlaub.
the.N.SG girl.N.SG enjoys its.N.SG vacation
'The girl is enjoying her vacation.'

b. Das Mädchen geniesst ihren Urlaub.
the.N.SG girl.N.SG enjoys her.F.SG vacation
'The girl is enjoying her vacation.' (Wurmbrand 2017:20)

In order to account for this fact in my system, I propose that while attributive modifiers, predicates and personal pronouns contain the simple [$*\gamma$:□$*$] probe that searches for grammatical gender only, the pronoun is also able to agree with the natural [F[anim]] gender of the hybrid noun.[49] This proposal allows us to recast the table 4.1 above in terms of the articulation of the probe that a certain agreement target has in a particular language, as tentatively suggested in Table 4.2 below. Importantly, the personal pronoun in German may, but does not have to, agree in natural gender. One way to capture this optionality is to assume that the probe can be relativized for some speakers only. The speakers who have the complex gender probe on their pronouns will always make use of semantic agreement, while those whose probe is simple will stick to grammatical gender. Another option is to assume that the gender probe of pronouns is always complex in German, but Gender Agree can have variable order with respect to Number Agree. In that case, allowing precedence to Gender Agree will yield natural gender agreement, whereas Number Agree as a first operation will yield grammatical gender agreement.[50].

A language from Corbett's (1983) survey that exhibits properties similar to German is Czech. The noun *děvče* 'girl' in Czech triggers patterns identical to those in German. While attributive, predicate and relative pronoun targets agree in neuter singular (144a-b), the personal pronoun can agree in the natural feminine gender (144c).

(144) a. To děvče se vdalo.
that.N.SG girl refl got.married.N.SG
'That girl got married.'

b. Najmula jsem děvče, které přišlo včera
hired.F.SG aux.1.SG girl who.N.SG came.N.SG yesterday
'I hired the girl who came yesterday.'

[49] See Wurmbrand (2016, 2017), who models the same facts by assuming that the probes before the cut-off point agree in uninterpretable features, while those following the cut-off point agree in interpretable features. Even though the intuition is essentially the same in my account, I do not follow this approach due to the inadequacy of using (un)interpretable features in deriving mixed agreement effects, as discussed in the previous chapter.

[50] This final point raises the question of whether a cut-off point can also be enforced by keeping the structure of the probe constantly complex, but restricting the orders of operations on the different probes. The answer is affirmative, and further detail will follow in the discussion in the parametric variation in Predicate Hierarchy effects. However, I believe that both mechanisms (complex probes and free ordering of Agree) need to be available in the architecture of the grammar since otherwise it would become impossible to capture such complex patterns as those in Russian with stacked adjectives and Agreement Hierarchy effects with them, analyzed in Section 3.2.2

c. To děvče přišlo včera, ale ja jsem je / ji
that.N.SG girl came.N.SG yesterday but I aux.1.SG it.N.SG / her.F.SG
nenajmula
not.hired
'That girl came yesterday, but I did not hire her.' Corbett (1983:11f.)

Based on this evidence, Czech can be tentatively placed in the same group as German, asssuming that all the targets before the personal pronoun have the simple [$*\gamma$:□$*$] probe, while the personal pronoun can have the more articulated [$*\gamma$:□[anim:□]$*$] one (and different orders of operations in addition).[51].

A different location for a cut-off point in gender agreement can be found in languages such as Spanish (Corbett 1991:230). Spanish resembles English in that it allows semantic agreement on all targets from the predicate on, requiring only the attributive modifiers to show formal agreement. Spanish titles, of the *your majesty*-type such as *Majestad*, are grammatically feminine nouns. However, these nouns can refer to a person of any natural gender. While the attributive elements always show formal agreement in grammatical feminine gender (145a), other agreement targets agree in the natural gender of the discourse referent (145b-c).

(145) a. su Majestad suprema
his majesty supreme.F
'His Supreme Majesty'

b. Su Majestad está contento
his majesty is happy.M
'His Majesty is happy.'

c. A Su Majestad suprema, el cual está muy contento aquí in Valencia,
to his majesty supreme.F the.M which is very happy.M here in Valencia
le reciberon con muchos aplausos. Él se mostró muy emocionado.
OBJ.CL received.PL with many applause he refl showed.M very moved
'His Supreme Majesty, who is very happy here in Valencia, was received with much applause. He showed himself very moved.' (Corbett 1991:230)

The logic of accounting for this state of affairs reflects the one applied to German and Czech. I propose that in languages of the Spanish and English type, with a strict distinction between attributive modifiers and predicates, the former have a gender probe that only searches for grammatical gender features, while the latter (as well as other agreement targets) have more articulated probes that search for natural gender, as summarised in Table 4.2.

At last, BCS and Russian seem to be the most permissive ones, allowing variation in every slot in the hierarchy. Rather than having a strict cut-off point, these languages express Agreement Hierarchy effects in terms of monotonicity. All agreement targets seem to be able to show

[51] However, some evidence from the Predicate Hierarchy effects that we will survey in the following chapter suggest that predicates in Czech do show natural gender and number agreement. Therefore, even though nouns in Czech seem to suggest that agreement is always with grammatical gender, pronouns will reveal that predicates can nevertheless be valued by semantic features. I return to this issue in Section 6.4

both kinds of agreement, but once semantic agreement is established on a certain target, all targets to the right must maintain semantic agreement.

	attributive	predicate	relative pronoun	personal pronoun
German, Czech	[∗γ:□∗]	[∗γ:□∗]	[∗γ:□∗]	[∗γ:□[anim:□]∗]
English, Spanish	[∗γ:□∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]
BCS, Russian	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]

Table 4.2: Agreement Hierarchy (Corbett 1991:235)

The short summary in Table 4.2 is one way of formalising the hierarchy, which points to a way to rethink the hierarchy effects. It suggests that the targets further to the right tend to have the more complex gender probe, while the targets to the left have a simpler one. This amounts to saying that the reason why targets further to the right show semantic agreement more is that they contain more complex probes.

Additionally, it might be instructive to repeat that the presence of a complex probe determines only the possibility of the semantic agreement, but not its necessity. As certain agreement targets can show optionality, I assume that in addition to a complex probe, they also have an underspecified order of Agree operations, one of them leading to agreement in semantic features, the other one in grammatical ones. Since the effects of ordering of operations will be dealt with in more detail within the account of the Predicate Hierarchy, I point the interested reader to Section 7.1.

Finally, it is also worth noting that while the cut-off point can occur between attributive and predicate and between relative pronoun and personal pronoun slots, such a point between the predicate and the relative pronoun does not seem to be attested. Looking at the table of Agreement Hierarchy effects compiled by Corbett (1983, 1991) repeated below, it truly seems to be the case that the predicate and the personal pronoun mostly show the same kind of agreement and the cut-off point is either before (with Spanish and Polish titles, Konkani young females, etc.) or after them (Czech *děvče* 'girl', Russian *para* 'pair', French titles etc.). An analysis of the reasons behind this typological gap represents one potential avenue for future research.

	attributive	predicate	relative pronoun	personal pronoun
Cz: *děvče* 'girl'	N	N	N	N/F
BCS: *gazde* 'masters'	F / (M)	F / (M)	(F) / M	M
Pol: titles ('her Majesty')	F	M	M	M
Rus: titles ('her Majesty')	N	N / M	?	M
Rus: *vrač* 'doctor'	M / (F)	M / F	(M) / F	F
French: titles	F	F	F	F / M
Spanish: titles	F	M	M	M

Table 4.3: Agreement Hierarchy cross-linguistically(Corbett 1983:27, Corbett 1991:235)

4.1.2.2 Cut-off point within the same slot in the hierarchy

In order to complete the picture on parametrisation of probes, a question that arises is whether there are certain cut-off points in agreement hierarchy effects within a single slot. So far we have seen that mismatches in the attributive slot are possible in languages such as Russian, Hebrew and Chichewa and marginally in BCS. However, the mismatches can occur between two adjectives (Russian, Hebrew), a possessive and a quantifier (Chichewa) and an adjective and a demonstrative (BCS).

What my account would predict is that it should be possible for a language to set up a border between nominal modifiers that agree strictly in formal features and those that show semantic agreement, as well as to have elements that allow for optionality. A general tendency is that those elements lower in the DP structure, such as adjectives that have non-restrictive, i.e. 'nonintersective, idiomatic or argumental interpretation' (Pesetsky 2013:37), mostly agree in formal features, while modifiers higher in the DP allow for semantic agreement more readily (Crockett 1976; Pesetsky 2013; Landau 2016).[52] However, at the moment this observation has scarce empirical coverage and more active research should be performed in order to confirm just how robust these patterns are and whether they lend themselves to an analysis in terms of a different degree of articulation of the gender probe. The patterns should be experimentally tested with a whole range of adjectives with different interpretation, their ordering, effects movement might have on them, their interaction with D-elements etc. The experimental results would make the empirical picture clearer and enable formulating reliable generalisations.

As a tentative analysis of this state of affairs, in Section 3.2.2.1 I suggested that lower adjectives in the DP carry simple gender probes [$*\gamma$:□$*$], while the higher ones are relativized for natural gender and therefore search for gender and animacy together. This idea would then be merely an extension of the proposal developed in the previous section, with the benefit of being applicable both between two slots in the hierarchy and within a single slot.

This idea might have to be additionally refined in order to analyse adjectival agreement in BCS. The challenge is that while adjectives seem to allow for both natural or grammatical gender agreement, they do not alternate in agreement within a single DP. In other words, even though natural gender agreement and grammatical gender agreement are allowed on individual adjectives in BCS, as repeated in (146), if the adjectives are stacked, the agreement marking on them needs to match (147a-b), and a mismatch is ungrammatical (147c):

(146) a. mnog-**e** gazd-**e**, koj-**e** su se obogatile...
many-F.PL master-PL who-F.PL AUX.3PL refl got.rich
'Many masters, who have got rich...'

[52] A similar result was presented by Arsenijević and Gračanin-Yuksek (2016) for agreement with relative pronouns. Relative pronouns in restrictive relative clauses in BCS prefer grammatical gender agreement, while relative pronouns in non-restrictive relative clauses can show variation between grammatical and natural gender agreement. Assuming that restrictive relative clauses are merged closer to the *n*, while appositive relative clauses, adjoin to D, this account confirms the idea that elements higher in the DP tend to be more liberal towards showing semantic agreement.

b. mlad-**e** gazd-**e**, koj-**i** tek počinju da izlaze...
young-F.PL master-PL who-M.PL just begin that go.out
'Many masters, who are just beginning to go out...' (Babić 1973:207)

c. *mlad-**i** gazd-**e**, koj-**e** tek počinju da izlaze...
young-M.PL master-PL who-F.PL just begin that go.out
'Many masters, who are just beginning to go out...'(Babić 1973:207, Corbett 1983:15)

(147) a. uspešne mlade gazde
successful.F.PL young.F.PL masters.PL
'successful young masters'

b. uspešni mladi gazde
successful.M.PL young.M.PL masters.PL
'successful young masters'

c. *uspešni mlade gazde
successful.M.PL young.F.PL masters.PL
'successful young masters'

The examples above show that adjectives in BCS must contain a complex [$*y$:□[anim:□]$*$] probe and they must also allow for different order of Agree operations so as to derive the patterns. However, once either grammatical or natural gender agreement is established on the lower adjective, the higher ones need to match it. A possible way to derive this may be to assume that once a certain order of operations is established on one item within the DP, it needs to be maintained on all other heads within this domain (see Murphy and Puškar to appear; Assmann et al. 2015 for similar restrictions on possible orderings of operations). As noted in Murphy and Puškar (to appear), this restriction might be formalised by having heads 'inherit' the order of operations from the heads they c-command (by some version of Agree), or perhaps by tranderivational constraints on matching which would filter out those derivations in which the values on adjectives do not match. Whatever the technical solution to this puzzle may be, what remains to be tested is how robust these patterns are to begin with, which would have to be performed in experimental setting, as the literature and the data from corpora do not offer enough evidence to base confident claims on.

When it comes to agreement targets in the predicate slot, hierarchy effects are indeed so abundant that the whole Part 3 of this dissertation is going to be dedicated precisely to them. As initially recorded by Comrie (1975), with respect to the possibility of showing formal or semantic agreement with hybrid controllers, the elements that typically belong to the 'predicate' slot in the Agreement Hierarchy have been proven to align according to the following implicational hierarchy:

(148) *The Predicate Hierarchy*:
FINITE VERB > PARTICIPLE > ADJECTIVE > NOUN
'For any controller that permits alternative agreements, as we move rightwards along the Predicate Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically (that is, with no intervening decrease).'
(Corbett 1983:43p., Corbett 2006:231)

We will see in Part 3 that different predicates in different languages can show either only semantic, or only formal, or both types of agreement, thus a cut-off point may appear between any two predicate targets. However, what is universal in all languages that show these effects is that the elements on the left, i.e. finite verbs, always show formal agreement, while the

predicate noun matches the semantic properties of the controller. Deriving these effects will prove to be possible by the same mechanism as the one adopted for the Agreement Hierarchy effects.

4.2 Deriving hybrid agreement in number

4.2.1 Agreement mismatches in Hebrew

An interesting mismatching agreement pattern in Hebrew has been described and analysed by Landau (2016). The mismatches in question come from agreement with the hybrid noun *be'alim* 'owners' in Hebrew. This noun, unlike the ones we have seen so far in Slavic, is hybrid in number. Its morphological form is the one of a plural noun, but it can nevertheless be used to refer either to a plurality of referents, or to a single one. As illustrated in the example (99), repeated below, in DP-internal agreement, it, by now unsurprisingly, triggers mixed agreement effects, which respect the restrictions of the Agreement Hierarchy.

(149) a. ha-be'alim ha-pratiyim ha-axaron šel ha-tmuna haya
the-owner the-private.PL the-last.SG of the-painting was.3.SG
ha-psixo'analitika'i Jacques Lacan.
the-psychoanalyst Jacques Lacan
'The last private owner of the painting was the psychoanalyst Jacques Lacan.'

b. *ha-be'alim ha-prati ha-axron-im šel ha-tmuna haya/hayu
the-owner the-private.SG the-last-PL of the-painting was.3.SG/was.3.PL
ha-psixo'analitika'i Jacques Lacan.
the-psychoanalyst Jacques Lacan
'The last private owner of the painting was the psychoanalyst Jacques Lacan.'
[Hebrew] (Landau 2016:1005)

The unmarked position of nominal modifiers in Hebrew is following the head noun. As (149a) illustrates, mismatches in number agreement are possible, such that the closest adjective 'private' agrees in grammatical plural, while the further one 'last', agrees in the semantic singular number. (149b) shows the reverse situation, which is ungrammatical due to the violation of Agreement Restrictions, namely once an adjective agrees with semantic number, the return to grammatical number agreement is impossible.

In order to analyse the Hebrew patterns under the current system, it is necessary first to be clear on the DP structure in this language and, accordingly, lay out our main assumptions on its contents. I build the analysis on the previous work on the DP structure and the representation of gender and number features in Hebrew by Ritter (1993); Kihm (2001); Shlonsky (2004); Faust (2013); Kramer (2015*b*); Landau (2016). In this language, a feminine noun can easily be derived out of a masculine stem, by adding a feminine suffix *-it, -et, -a*. In contrast, plural is derived by adding the suffix *-im* to masculine nouns (the suffix that also builds the plural form of the noun under scrutiny here, *be'al-im*), or adding a suffix *-ot* to a feminine noun:

Masculine noun		*Feminine noun*	
singular	plural	singular	plural
magav 'viper'	*magav-im* 'vipers'	*magav-et* 'towel'	*magav-ot* 'towels'
maxasan 'warehouse'	*maxasan-im* 'warehouses'	*maxasan-it* 'magazine'	*maxasan-ot* 'magazines'
amud 'page'	*amud-im* 'pages'	*amud-a* 'column'	*amud-ot* 'columns'

Table 4.4: Hebrew number and gender (Ritter 1993:796)

I conclude therefore, that the suffix *-im* on the plural noun *be'al-im* is an inflectional suffix, indicating only the plural number of the noun, unlike *-it, -et, -a, -ot*, all of which additionally carry feminine gender features (cf. Ritter 1993; Faust 2013). Gender is generally argued to be an inherent property of the noun stem in Hebrew, while number is mostly an inflectional property. Gender has been claimed to be encoded closer to the stem. Evidence for this claim comes from certain exceptions – nouns that formally seem to switch gender in the plural. These are, for instance, some feminine nouns selecting for masculine plural suffix and vice versa.[53] An example is the inherently feminine noun *šana* 'year', which builds plural by adding the suffix *-im*, usually added to masculine nouns. Nevertheless, this noun always agrees based on its inherent feminine gender (150)-(151) (Ritter 1993). Thus, plural number marking does not tamper with the gender on the noun. This additionally supports the idea that the suffix *-im* does not mark gender, but only realises the number feature.

(150) a. šana tov-a
year.F.SG good-F.SG
'a good year'

b. *šana tov
year.F.SG good-M.SG
'a good year'

(151) a. šan-im tov-ot
year-PL good-F.PL
'good years'

b. *šan-im tov-im
year-PL good-M.PL
'good years' (Ritter 1993:799)

Combining the proposals of Kramer (2015*b*) and Ritter (1993), I model these observations by assuming that gender in Hebrew is represented on *n*, while number is located on the NumP.[54] I assume that the noun *be'alim* is special in that, apart from encoding the [#:pl] feature on the NumP, a natural [#:sg] feature can be added to the the noun's *n*P (cf. Kramer 2015*b*:161f.).

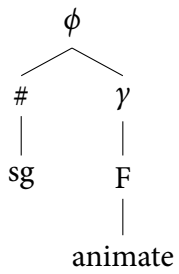
[53] Gender-switching nouns constitute closed classes and while around 70 masculine nouns in Hebrew build their plural with the [F, pl] suffix, cca. 50 feminine nouns do the opposite (Kihm 2001). But, even in that case, the 'lexical' gender is the one that participates in agreement:

(i) šulxan-ot ktan-im (sg. šulxan katan)
table-F.PL small-M.PL
'small tables' [Hebrew] (Kihm 2001)

[54] But see Faust (2013) for a detailed proposal (extending the Fathi and Lowenstamm 2016 analysis of French) about treating feminine suffixes in Hebrew as roots, which attach to noun roots to derive a complex Root-Phrase, which is then turned into a noun after being selected by a nominalizer *n*. This approach analyses only feminine suffixes in Hebrew. I will not pursue it further here since my analysis deals with the masculine suffix present on the noun *be'al-im*, which, as noted above, most probably realises only number features. Thus, the internal structure of the *n*P itself is irrelevant for the purpose of the argument.

In modelling how this natural number feature relates to the natural gender of the *n*, I assume that both features are present together on the same *n*. This assumption will receive further support in accounting for the Predicate Hierarchy in the chapters to follow. I propose that natural gender and number on *n* are organised into a feature geometry. Following the Harley and Ritter (2002) feature geometry approach, the two features can be assumed to form a hierarchy such as the one in (152):

(152)



The hierarchy in (152) essentially models the 'Individuation' mode from the geometry of Harley and Ritter (2002), which is the node assumed to encode gender and number together. Similar assumptions were utilized explicitly by Preminger (2014:47), Deal (2015) for the structural representation of person and number with the geometries exactly mirroring those in (152). This assumption is also implicitly present in any other approach relying on the geometric structure of ϕ-features. And yet, even though feature geometries are assumed to exist on syntactic objects that participate in Agree relations, exactly how the hierarchies are assembled and how they become encoded on syntactic heads is, to the best of my knowledge, not explicitly discussed.[55] Even though I will also leave this deeply interesting question for future research, I expect that this research should go in the direction of the assumption that feature geometries are assembled before they reach narrow syntax, either in the lexicon, in the numeration, or on a separate workspace, after which they are connected to the respective heads that host them in syntax. In any event, for the purposes of my account, the diagrams for the derivations we will encounter below do not involve recursive syntactic building of a tree within a tree, but rather, the feature geometries on *n* heads enter the derivation together with the head that hosts them. I further assume that Gender Agree and Number Agree are two separate operations in Hebrew as well. I assume that the gender probe is relativized towards natural gender. Additionally, as before, copying a feature from the goal to the probe means copying all the features that this feature entails, i.e. all the feature that dominate it, as required by the Condition on Full Valuation (CFV) (37). Thus, if natural number is present on an *n*P in the geometry together with natural gender, and the probe needs to copy only gender features, I assume it cannot

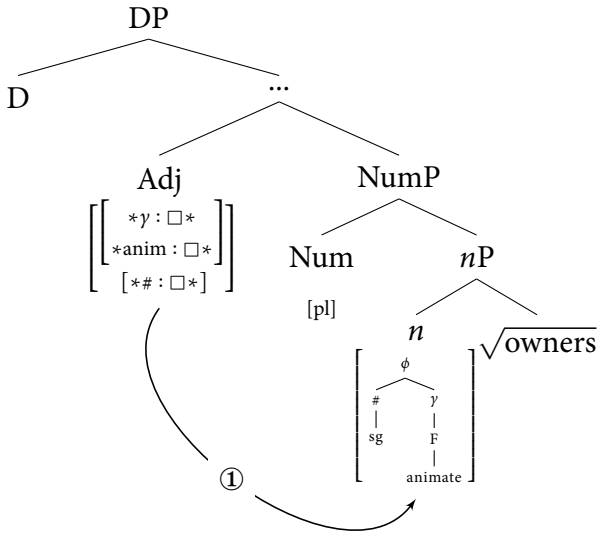
[55] In their original formulation of the proposal for feature geometries, Harley and Ritter (2002) only try to capture the morphological realisations of these features, disregarding their structure in syntax and role in agreement. According to them, certain issues need to be 'sorted out before [the] proposal can be extended to this domain. Notably, we need a better understanding of the nature of the grammatical mechanism involved in agreement (copying vs. checking, for example), as well as a reliable diagnostic for distinguishing between pronominal clitics and verb agreement.' (Harley and Ritter 2002:482)

do so without copying all the features that make up the snippet of the feature geometry (cf. Preminger 2014:47). Put differently, if the gender probe [$*\gamma$:□[anim:□]$*$], has reached the *n*P and matched the gender and animacy features present on it, by copying these features, it 'pulls together' the rest of the features present in the geometry, as an inseparable part of it, since the CFV prohibits the valuation of the probe with only a subset of the goal's features.[56] This way, copying ϕ-features indeed means copying the entire snippet, regardless of the fact that some of the features were not a part of the specification of the probe. Similar ideas were advocated by Béjar (2003); Béjar and Řezáč (2009); Preminger (2014); Deal (2015), in inspecting the interactions of person and number features. As a consequence, this approach rules out partial valuation in two directions. First, a complex articulated probe, such as [$*\gamma$:□[anim:□]$*$], cannot enter an Agree relation with a head that has only a subset of its features, e.g. a Gen head which only has a gender feature. It will skip such goals in search for a full match and only then will valuation be allowed. Conversely, if a goal is supposed to value a probe, it cannot value this probe with only a subset of its own features. It must contribute *all* of the features it has.

Against this theoretical background, what derives the singular (natural number) agreement with the Hebrew plural noun *be'alim* 'owners' is giving the advantage to the gender probe to perform its Agree operations. Therefore, probing for natural gender features will lead to masculine singular valuation of the probe. This results from ordering the gender probe before the number probe. In search for the natural gender value, the first probe will find the required value on *n*. Since the features are embedded in a geometry that includes both the masculine gender and the singular number feature (see (152)), the entire geometry will be copied onto the Adjective. Since the [#:sg] value is also copied in the process, it automatically satisfies the number probe on the Adj, rendering the Number Agree operation unnecessary. The result is then natural [M[anim]] [#:sg] agreement:

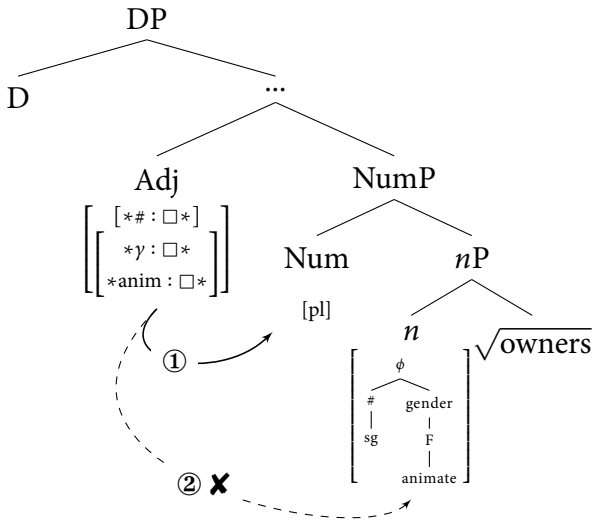
[56] See also Preminger (2014:57) for a similar proposal employed in order to account for clitic doubling in Agent Focus constructions in Kichean. According to him, in clitic doubling constructions in this language, the person probe, even though it searches only for person features, must copy the entire geometry of ϕ-features it finds, which includes number values as well.

(153) Agreement in natural gender and number:



If, on the other hand, the [#:□] probe is discharged first, the closest valued goal that it encounters in its search domain is the [#:pl] feature on the NumP. This feature will therefore be copied by Number Agree. The following operation cannot search below the phrase that has already been targeted due to the *Condition on Agree Domains*, whereby Gender Agree fails when this order of operations applies.

(154) Agreement in grammatical number:



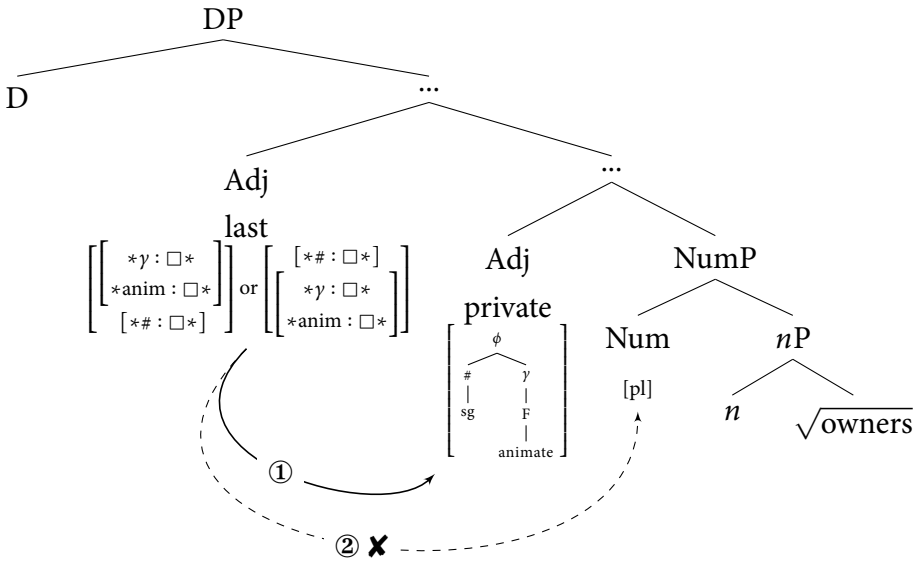
At the end of this process, the adjective receives only the value [#:pl]. As we have seen above, since the suffix *-im* is only specified for number and does not encode gender, realising the adjective's feature by this inflection is unproblematic, as gender specification is irrelevant.

The effects of the Agreement Hierarchy come about as a consequence of the mechanism outlined. Agreement Restrictions are reflected in the restriction to natural number agreement

of higher probes once an adjective has realised these features. In the current system, if the natural gender and number features are copied on an adjective, these features will be the only ones available for higher probes. Under any order of Agree operations, any subsequent probe will find the closest available natural [M[anim]] gender feature and the [#:sg] number feature on the adjective that has already copied them from *n*. Targeting Num, and its [#:pl] feature is always going to be excluded by the CAD (156). This is what rules out the ungrammatical (149), repeated in (155). Note that adjectives in Hebrew, like in Chichewa above, follow the head noun, which implies that the adjective linearly further away from the noun is in fact the higher one in the structure. However, I present the structures below as left-branching for ease of exposition (cf. Landau 2016).

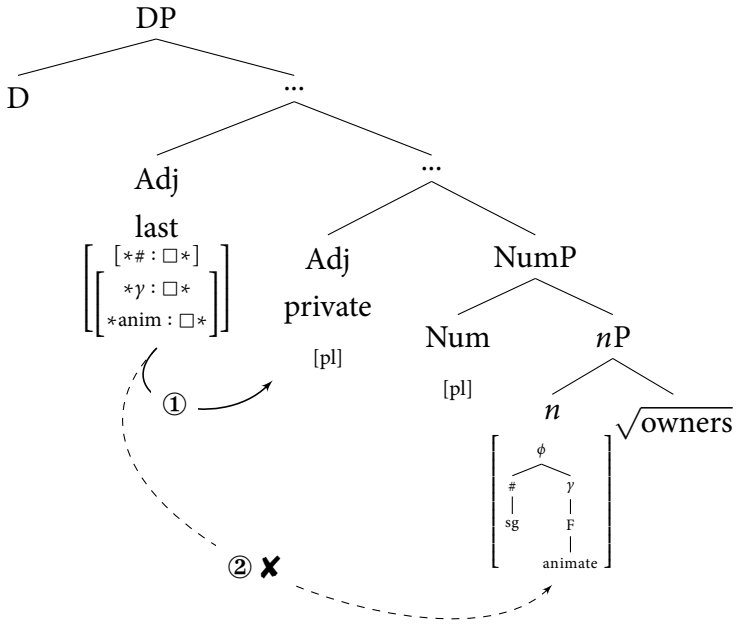
(155) *ha-be'alim ha-prati ha-axron-im šel ha-tmuna haya/hayu
the-owner the-private.SG the-last-PL of the-painting was.3.SG/was.3.PL
ha-psixo'analitika'i Jacques Lacan.
the-psychoanalyst Jacques Lacan
'The last private owner of the painting was the psychoanalyst Jacques Lacan.'
[Hebrew] (Landau 2016:1005)

(156) Agreement on higher adjectives: natural number and gender



On the other hand, if the grammatical [#:pl] feature is projected by the lower adjective as a result of Number Agree > Gender Agree, as before in Russian and BCS, the higher adjective still has a choice. If it maintains the same order of operations and decides to value number first, the closest feature it will find is the one on the lower Adj, copied from Num. Due to the CAD, the Adj will not probe any further and no gender feature will be valued on the higher Adj:

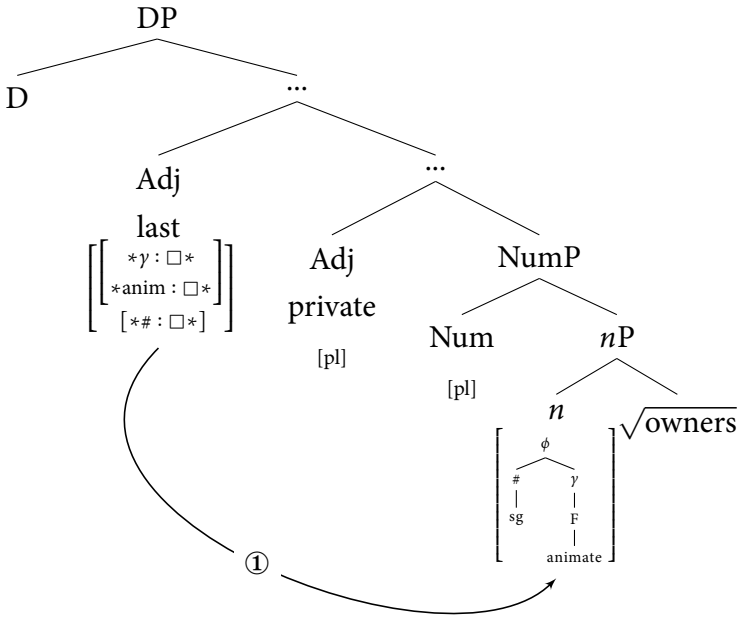
(157) Agreement on higher adjectives: grammatical number



If, however, the Adj decides to search for gender features first this time, such features will still be available on *n*, where they are originally encoded. This Adj probes all the way down to *n* in order to copy the gender features. Since copying of this features pied-pipes the rest of the geometry, the features of the higher Adj are valued by the natural [M[animate]] [#:sg] features. As before, agreement on any subsequent probe will be restricted to semantic agreement by this derivational choice. The relevant example and the derivation are given in (158) and (159).

(158) ha-be'alim ha-pratiyim ha-axaron šel ha-tmuna haya ha-psixo'analitika'i
the-owner the-private.PL the-last.SG of the-painting was.3.SG the-psychoanalyst
Jacques Lacan.
Jacques Lacan
'The last private owner of the painting was the psychoanalyst Jacques Lacan.'
[Hebrew] (Landau 2016:1005)

(159) Agreement on higher adjectives: natural number



What Hebrew teaches us is that a probe can prefer not only natural gender, but also natural number features (cf. agreement with the *committee*-type nouns in British English). What our account teaches us is that these preferences can be modelled by extending it to natural number valuation, which can be seen as a side-effect of probing for natural gender. Since this feature is deeply embedded in the feature geometry, its copying means copying all the features that entail it, which on the surface always yields agreement in semantic features.

Part III

Deriving Predicate Hierarchy effects

Chapter 5

The Predicate Hierarchy puzzle

One of the main findings of the studies of the Agreement Hierarchy is that agreement targets of different kinds differ with respect to the possibility of showing semantic agreement, and depending on their ability and readiness to do so, they form an implicational hierarchy. However, elements that form this hierarchy (attributive, predicate, relative pronoun, personal pronoun) are not themselves uniform categories. For instance, 'attributive' is a cover term for all attributive modifiers, among which we can distinguish between attributive adjectives, possessives, demonstratives, articles, etc. All of these elements can agree in number and gender with hybrid controllers, and as shown in the previous chapters, they differ with respect to their ability to show semantic agreement, such that the elements higher in the DP functional sequence show semantic agreement more readily than the lower ones, respecting the Distance Principle. Similarly, the 'predicate' function can be fulfilled by different types of categories – auxiliaries, finite verbs, various types of participles, predicate adjectives, and nouns. In the sections to follow, we will first explore some evidence that confirm the existence of an implicational hierarchy among these types of predicates, such that the possibility of semantic agreement increases as we move rightwards from the auxiliary to the predicate noun. Deriving the restrictions to, and preference for, formal or semantic agreement, as well as optionality between the two in the current system is the broad topic of this part. Most of the discussion will be based on patterns in number agreement with honorific pronouns.

This part is organised as follows. In the following two sections, I will outline the basic empirical problem of the Predicate Hierarchy and what aspects of it are problematic for agreement theories. The solution that I offer will be presented throughout Section 6, for each of the agreement targets that make up the hierarchy. Section 7 contains concluding remarks and a discussion of how the system of agreement that seems to be mainly developed to account for mixed agreement patterns actually trivially derives the patterns of agreement with regular nominals as well.

5.1 The empirical problem

With respect to the possibility of showing formal or semantic agreement with hybrid controllers, the elements that typically belong to the 'predicate' slot in the Agreement Hierarchy have been proven to align according to the following implicational hierarchy:

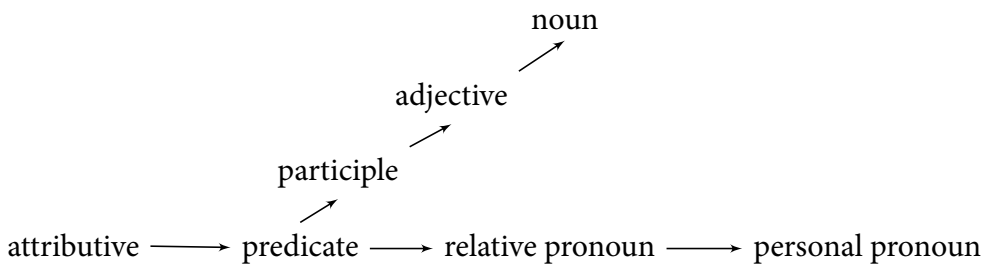
(160) *The Predicate Hierarchy*:
FINITE VERB > PARTICIPLE > ADJECTIVE > NOUN
'For any controller that permits alternative agreements, as we move rightwards along the Predicate Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically (that is, with no intervening decrease).'
(Corbett 1983:43f., Corbett 2006:231)

According to Corbett (2006), the Predicate Hierarchy, first recorded and defined by Comrie (1975), was in fact the precedent and inspiration for the study and postulation of the Agreement Hierarchy. In trying to represent the interrelatedness between the two types of hierarchies, one way to do it schematically would be to just plug in the proposed hierarchy into the 'predicate' slot of the Agreement Hierarchy, as in (161).

(161) *Agreement Hierarchy and Predicate Hierarchy combined* (incorrect):
attributive > {finite verb > participle > adjective > noun} > rel. pronoun > pers. pronoun
(Corbett 1983:88f.; Corbett 2006:233).

This assumption, however, would be incorrect. According to Corbett (2006:233) and references therein, all the evidence available proves that the predicate noun almost always shows semantically justified agreement, and should not therefore stand before, say, relative pronoun (which can agree in either formal or semantic features, depending on a language), in the hierarchy above. Instead, Corbett (2006:233) proposes that the two hierarchies can be combined in the manner sketched in (162). This way, the Predicate Hierarchy is represented as orthogonal to the Agreement Hierarchy, and not as incorporated in it, and the condition that semantically justified agreement applies more frequently to the elements on the right holds for both of them.

(162) *Agreement Hierarchy and Predicate Hierarchy combined* (Corbett 2006:233)



The hybrid controller that Comrie (1975) first based his observations on was the pronoun for polite address, or the honorific pronoun. In languages such as Slavic, some from the Romance family (French, Italian, Romanian), as well as Modern Greek, the second person plural pronoun is used when politely addressing a single person. Some of the predicates in these languages, such as finite verbs, always show plural agreement, i.e. they agree with the *grammatical* features of the second person *plural* pronoun. However, other predicates, such as participles and adjectives, can show either plural agreement, consistent with the finite verbs and auxiliaries, or they can show an interesting behaviour – *singular* agreement and agreement in the *natural gender* of the referent, which constitutes an instance of purely *semantic* agreement (since the gender and singular number are not encoded in the morphology of the pronoun). In the remainder of the section, we will review the evidence for the existence of the hierarchy effects based on data from number agreement in these languages.

Slavic languages are especially convenient for studying these patterns because of the great degree of variation in agreement that they show. Most Slavic languages use the second person plural pronoun *Vy* for polite address. This pronoun has grammatically specified [π:2] and [#:pl] features. However, different predicates in different languages may allow singular agreement (when addressing an atomic individual) and, if required, gender agreement. For instance, in Czech, the finite verb shows [π:2, #:pl] agreement, while the participle, adjective and noun show [#:sg] and gender-dependent agreement:[57]

(163) a. Vy **jste** byl-**a** dobr-**á** / *byl-**y** dobr-**é**.
you aux.2.pl been-f.sg good-f.sg / been-f.pl good-f.pl
'You (female addressee) were good.'

b. Vy **jste** byl-**a** učitelk-**a** / *byl-**y** učitelk-**y**.
you aux.2.pl been-f.sg teacher-f.sg / been-f.pl teacher-f.pl
'You (female addressee) were a teacher.' [Czech] (Comrie 1975:408)

French (164)–(166), some Italian dialects (167), Romanian (168)–(169) and Modern Greek

[57] The value of the gender feature depends on the natural gender of the referent. Even though Comrie (1975:408) classifies Czech as a language that optionally allows formal agreement on the participle and the predicate adjective, it seems that with contemporary native speakers semantic agreement is the only option (judgements provided by Petr Biskup, p.c.).

(170)–(171) behave the same as Czech. The second person plural pronoun triggers second person plural agreement on the finite verb, while the predicate adjective and participle reflect the natural gender and singular number feature of the referent.

(164) Vous êtes venu / *venus.
you aux.2.pl come.m.sg / come.m.pl
'You (male addressee) have come.' [French] (Comrie 1975:409)

(165) Vous êtes loyal / *loyaux.
you aux.2.pl loyal.m.sg / loyal.m.pl
'You (male addressee) are loyal.' [French] (Comrie 1975:409)

(166) Vous êtes (le) professeur / *les professeurs.
you aux.2.pl the professor.m.sg / the professor.pl
'You (male addressee) are a professor.' [French] (Comrie 1975:409)

(167) Non vi siete innamorato / *innamorati.
not 2.pl.clit aux.2.pl in.love.m.sg / in.love.m.pl
'You (male addressee) haven't fallen in love.' [Italian] (Comrie 1975:409)

(168) Dumneavoastră ați fost invitat / *invitați.
you.polite.2.pl aux.2.pl been invited.m.sg / invited.m.pl
'You (male addressee) have been invited.' [Romanian] (Comrie 1975:409)

(169) Dumneavoastră sînteți bun / *buni.
you.polite.2.pl aux.2.pl good.m.sg / good.m.pl
'You (male addressee) are good.' [Romanian] (Comrie 1975:409)

(170) Eîste ikanopoiēménos.
aux.2.pl pleased.sg
'You are pleased.' [Modern Greek] (Comrie 1975:409)

(171) Eîste ho basileús.
aux.2.pl the king.sg
'You are the king.' [Modern Greek] (Comrie 1975:409)

Looking at these languages from the point of view of the elements of the Predicate Hierarchy, it seems like they have a clear cut-off point between its two elements – the finite verb and the participle (172). The elements to the left of this point all show formal agreement, while the elements to the right agree in semantic features.

(172) finite verb || participle > adjective > noun
(gram. [π:2, #:pl]) (nat. [gen, #:sg])

Similarly, predicates in languages like Ukrainian, Belorussian and Slovakian can also show mixed agreement patterns, but with a crucial difference – the participle agrees in plural number and default masculine gender (173a), (174a) and (175a) while the predicate adjective shows

singular and gender-dependent agreement (173b), (174b) and (175b).[58] Such languages then seem to have their cut-off point placed between the participle and the predicate adjective (176) such that all the elements to the left of this point agree in formal features, while the elements to the right of it show semantic agreement. This cut-off point seems to be categorical in Ukrainian, Belorussian, Slovak and Lower Sorbian, and most probably Russian, which seem to show the same behaviour according to Comrie's (1975) survey.

(173) a. Čoho vy tam sidite?
why you.2.PL there sit.M.PL
'Why are you (single addressee) sitting there?'

b. Vy tam potribnyj.
you.2.PL there necessary.M.SG
'You (single addressee) are needed there.' [Ukrainian] (Corbett 1983:50-51)

(174) a. .. vy tut sjadzeli, čytali...
you.2.PL here sat.M.PL read.M.PL
'You (single addressee) sat and read there...'

b. Vy – malady, a paspeli tak mnoha načytacca.
you.2.PL young.SG but managed.M.PL so much read.refl
'You (single addressee) are so young, but you managed to read so much.'[Belorussian]
(Corbett 1983:51)

(175) a. Otec, čo ste robili?
father what aux.2.PL done.M.PL
'Father, what have you done?'

b. Mama, vy ste taká dobrá!
mother you aux.2.PL so good.F.SG
'Mother, you are so kind!' [Slovak] (Corbett 1983:44)

(176) finite verb > participle || adjective > noun
(gram. [π:2, #:pl]) (nat. [gen, #:sg])

Finally, there is one last group, in which languages optionally allow formal or semantic agreement on the participle, predicate adjective, or both. Languages that instantiate this pattern would be BCS, Bulgarian, Polish (dialects), Slovenian, Macedonian, Icelandic (and possibly Upper and Lower Sorbian). As already mentioned, BCS would seem to prefer plural agreement on the participle and on the adjective, which is the reason why the literature so far has classified it as a 'uniform agreement language' (cf. Wechsler 2011; Wechsler and Hahm 2011; Despić 2017).

[58] Even though Corbett (1983:51) asserts that some Ukrainian writers contend that there is variation in both positions, the participle and the predicate adjective, Ukrainian is listed as a language that has a strict cut-off point between the participle and the predicate adjective based on the claims of contemporary native speaker intuitions (judgements provided by Yuriy Kushnir, p.c.). As for Belorussian and Slovak, I rely on the data from the literature, provided by Corbett (1983).

(177) a. Vi ste bil-**i** pospan-**i**.
you.2.PL aux.2.PL been-M.PL sleepy-M.PL
'You (feminine addressee) were sleepy.'

b. #Vi ste bil-**a** pospan-**a**.
you.2.PL aux.2.PL been-F.SG sleepy-F.SG
'You (feminine addressee) were sleepy.'

c. Vi ste profesoric-**a** / *profesoric-e.
you.2.PL aux.2.PL professor-F.SG / professor-F.PL
'You (feminine addressee) are a professor.'

Since BCS is one of the languages under closer scrutiny throughout this work, and notorious for its variation in the possible agreement patterns (see, for instance, Willer-Gold et al. 2016 for some aspects of this variation), it is worth noting that previous literature, especially the works by Comrie (1975); Stevanović (1989); Corbett (1983); Despić (2017) admit that semantic agreement on participles and adjectives is possible in this language as well.

(178) a. Vi ste podao i lud.
you.2.PL aux.2.PL vile.M.SG and crazy.M.SG
'You (male addressee) are vile and crazy.'

b. Vi ste takva i ne možete biti drukčija.
you.2.PL aux.2.PL such.F.SG and not can.2.PL be different.F.SG
'You (female addressee) are like that and you can't be different.'
(Stevanović 1989:127)

Instances of mixed agreement on both participles (179)–(181) and predicate adjectives (182)–(183) in everyday speech can easily be found by means of a simple web search.[59] Most of the examples of semantic agreement on participles and predicate adjectives I have found come from Croatian varieties, and they are mostly colloquial and highly discouraged and dispreferred from a prescriptive point of view. Yet, based on the comments on different forums, it seems like they are a part of everyday language usage.[60]

(179) Vi ste bila kod nas u zarobljeništvu...[61]
you.2.PL aux.2.PL been.F.SG by us in imprisonment
'You (female addressee) were our prisoner.'

(180) Vi ste rekla što se nitko drugi nije usudio... [62]
you.2.PL aux.2.PL said.F.SG what refl noone other not.aux.3.PL dared
'You (female addressee) said what no one else dared to say.'

[59] The web search was performed for the lack of evidence in reference grammars, due to the marginality of the agreement patterns in question.

[60] *Unatoč onome što možemo čuti na tržnici i ulici, izraz Vi iz poštovanja uvijek stoji uz predikat u množini muškog roda, bez obzira obraćamo li se muškarcu ili ženi.* 'In spite of what we can hear at the market and on the street, the polite expression *Vi* always stands with a predicate which is masculine and plural, regardless of whether we are addressing a man or a woman.' (http://lingolero.com/2014/05/vi-ste-dosla/, accessed 12.04.2017)

[61] http://bozli22.blogspot.de/, accessed 12.04.2017.

(181) Vi ste imala sreću za Božić?[63]
you.2.PL aux.2.PL had.F.SG luck for Christmas
'You (female addressee) had luck for Christmas?'

(182) Vi ste lepa, pametna i uspešna – zašto vas muškarci ne vole?[64]
you.2.PL aux.2.PL beautiful.F.SG smart.F.SG and successful.F.SG why you men not love
'You (female addressee) are beautiful, smart and successful – why do men not like you?'

(183) Vi ste bio prisutan jednom sastanku kod Tomašića gdje su bili pozvani i ostali funkcioneri HSS-a, pa nam o tome kažite.[65]
you.2.PL aux.2.PL been.M.SG present.M.SG one meeting at Tomašić where aux.3.PL been invited and other officials HSS so us about that tell
'You (male addressee) were present at a meeting at Tomašić's, where other HSS officials were also invited, so tell us about that.'

Predicate nouns are always singular, but their gender may or may not match the gender of the referent denoted by the honorific pronoun. Thus a predicate noun can be feminine when the honorific pronoun refers to a female person, like the nouns *balerina* 'ballerina' and *pisateljica* 'female writer' in (184), or *pionirka* 'female pioneer' in (185), but we can also have a masculine predicate noun with a honorific pronoun referring to a female, like *poznavalac* 'expert' in (184) or a feminine noun with a masculine referent, such as *osoba* 'person' in (186). (Note that with all the predicate nouns below, the participle of the copula 'be' also agrees in the natural gender of the referent).

(184) Vi ste bila uspešna i cenjena balerina, pisateljica i poznavalac svetskih kultura.[66]
you.2.PL aux.2.PL been.F.SG successful.F.SG and reputable.F.SG ballerina.F.SG writer.F.SG and expert.M.SG of.world's cultures
'You were a successful and reputable ballerina, writer and an expert on world's cultures.'

(185) Branila se Jugoslavija gospodjo Vjera i vi ste bila Titova pionirka[67]
defended refl. Yugoslavia madam Vjera and you.2.PL aux.2.PL been.F.SG Tito's.F.SG pioneer.F.SG
'Yugoslavia was being defended, madam Vjera, and you were Tito's pioneer.'

[62] http://www.rudan.info/heroina-na-apaurinu/comment-page-1/, accessed 12.04.2017.
[63] http://docslide.net/documents/patricia-cornwell-posljednja-postaja-11.html, accessed 12.04.2017.
[64] https://www.trafika.online/proizvod/23411/placebo-ste-vi-snaga-vaseg-uma, accessed 12.04.2017
[65] hrcak.srce.hr/file/223829, accessed 13.04.2017.
[66] http://www.koreni.rs/sonja-lapatanov-veciti-putnik/, accessed 12.04.2017

(186) Vi ste bio prepoštena osoba, domoljubne
you.2.PL aux.2.PL been.M.SG too.honest.F.SG person.F.SG of.patriotic
provenijencije, što nije odgovaralo ljudima kojima ste bili
provenance which not.aux.3.SG suited peope by.who aux.2.PL been.M.PL
okruženi.[68]
surrounded
'You (male referent) were too honest a person, of a patriotic provenance, which did not suit the people you were surrounded with.'

It seems therefore that semantic agreement in BCS is not completely ungrammatical, but it is instead available as a dialectal option or a means to achieve a stylistic effect (due to its archaic connotation), a fact also noted in the previous literature (Stevanović 1989; Comrie 1975; Corbett 1983, 2006; Wechsler 2011; Wechsler and Hahm 2011; Despić 2017). The data above may indicate a process of language change, possibly influenced by the attempts to use more politically correct and gender-appropriate language, despite strong objections coming from normative grammars. The uncertain status of these examples indicates the absolute necessity of their experimental testing with a bigger number of speakers of different varieties of BCS, in order to determine the exact grammaticality status of these constructions and the acceptability of variation among dialects and speakers. Whatever the cause, these examples clearly indicate that semantic agreement in BCS is a matter of individual and dialectal variation, which any theory of agreement should have a way to capture.

Moreover, Bulgarian has been classified as a language with a cut-off point between the participle and the predicate adjective by Corbett (1983), but it seems that native speakers of this language allow both agreement options on the participle (187a)-(187b). The singular agreement is more colloquial and not recommended by standard usage.[69]

(187) a. Vie nikoga ne ste bili na opera.
you.2.PL never not aux.2.PL been.M.PL in opera
'You (single addressee) have never been to the opera.'

b. Gospožo, vie nikoga ne ste bila na opera.
lady you.2.PL never not aux.2.PL been.M.PL in opera
'Lady, you have never been to the opera.' [Bulgarian]

The situation in Macedonian is somewhat reversed. According to my informants, the participle prefers formal agreement (188a), while semantic agreement is preferred on the predicate

[67] http://www.autonomija.info/stasa-zajovic-vojvodina-mora-da-se-oduzi-vukovaru-i-sebi.html, accessed 12.04.2017.

[68] http://narod.hr/hrvatska/branko-hrg-udarac-direktno-srce-hss-a-smisljena-namjera-da-se-ide-unistavati-stranka, accessed 13.04.2017

[69] The Bulgarian judgements come from my informant Asen Tar. Interestingly, according to my informant, predicate adjectives and another type of participles, the so called *-n/-t* participles which are used with a passive meaning all require semantic agreement in gender and singular number. This points to a different behaviour between active and passive participles, as well as to a relationship between passive participles and predicate adjectives, to be elaborated in Section 6.5.3 below.

adjective (188b). However, plural agreement on the adjective can also be found (188c).[70]

(188) a. Vie nikogaš ne ste bile vo opera.
you.2.PL never not aux.2.PL been.PL in opera
'You (single addressee) have never been to the opera.'

b. Vie ste pametna / ubava.
you.2.PL aux.2.PL smart.F.SG / beautiful.F.SG
'You (feminine addressee) are smart / beautiful.'

c. Vie ste pametni / ubavi.
you.2.PL aux.2.PL smart.PL / beautiful.PL
'You (feminine addressee) are smart / beautiful.' [Macedonian]

In summing up the results, I rely on the extensive summary provided by Wechsler (2011), supplemented (and somewhat simplified) by the data obtained from the current usage of native speakers:

	finite verb	participle	adjective	noun
Romance				
French	PL	SG	SG	SG
Romanian	PL	SG/(PL)	SG	SG
Italian dialects	PL	SG	SG	SG
Modern Greek	PL	SG	SG	SG
Icelandic	PL	n.a.	PL / SG	n.a.
West Slavic				
Czech	PL	SG	SG	SG
Slovak	PL	PL	SG	SG
Lower Sorbian	PL	PL	PL / SG	SG
Upper Sorbian	PL	(PL) / SG	(PL) / SG	SG
Polish dialects	PL	PL / SG	PL / SG	SG
South Slavic				
Bulgarian	PL	PL / SG	SG	SG
Macedonian	PL	PL	PL / (SG)	SG
BCS	PL	PL / (SG)	PL / (SG)	SG
Slovenian	PL	PL / (SG)	PL / (SG)	SG
East Slavic				
Ukrainian	PL	PL	SG	SG
Belorussian	PL	PL	SG	SG
Russian	PL	PL	short form PL 97%	SG
			long form SG 89%	SG

Table 5.1: Predicate Hierarchy effects (Wechsler 2011:1003)

Wechsler (2011:1003) summarises the results as follows: 'Romance, Modern Greek, and Ice-

[70] The Macedonian judgements were provided by Roza Kitanoska.

landic data are from Comrie (1975); Slavic data are from Corbett (1983:56f.). Percentages indicate data from corpus studies reported by Corbett (1983:56; Table3.5). As shown in the table, with polite plural pronoun subjects with a singular referent, plural number was found on ... 97% of Russian short form adjectives, and 89% of Russian long form adjectives. 'Other parentheses indicate less frequent or less preferred variants.' (Corbett 1983:56). The Romanian participle takes the singular but Comrie (1975:410) also notes 'the possibility of the plural in non-standard Romanian.' The 'Italian dialects' are 'regional (especially southern) forms of Italian'; Comrie (1975:409) cites examples from Verga's *I Malavoglia*. Icelandic data on finite verb and adjective agreement are from Comrie (1975:409). Dialects spoken in southeastern Poland are described by both authors (Comrie 1975:406-407, Corbett 1983:45-46). Serbian/Croatian nominative pronouns trigger plural (preferred) or singular, depending on dialect, while non-nominatives uniformly trigger singular. Russian Short Form and Long Form adjectives differ, as shown.'

The table above can also be reorganised in the manner shown in Table 5.2, such that the given languages are classified according to the placement of the cut-off point and the possibilities for allowing optionality in agreement. The first group is occupied by the languages that uniformly show semantic agreement on targets other than the finite verb. In contrast, according to the current results, there seems to be a typological gap with respect to a reverse kind of language, marked as Group 1a below, which would have a cut-off point between the predicate adjective and the predicate noun, such that the participle and the predicate adjective would uniformly show formal agreement and the noun semantic. Future research, with the empirical domain extended to other languages, should be tasked with confirming whether this gap is systematic or accidental, and how it can be explained. Group 2 comprises languages whose participles agree in formal plural number, while the predicate adjectives show semantic agreement. Russian is tentatively placed in this group, pending further discussion, which will show that the short form adjectives are more verb-like, unlike the long-form adjectives, which are more nominal in nature (cf. similar observations by Comrie 1975). The final group is represented by all the languages where optionality in agreement obtains on the participle and/or the adjective.

Group 1	finite verb ||	participle	adjective	noun
French	PL	SG	SG	SG
Romanian	PL	SG/(PL?)	SG	SG
Italian dialects	PL	SG	SG	SG
Modern Greek	PL	SG	SG	SG
Czech	PL	SG	SG	SG
Group 1a	**finite verb**	**participle**	**adjective ||**	**noun**
?	PL	PL	PL	SG
Group 2	**finite verb**	**participle ||**	**adjective**	**noun**
Ukrainian	PL	PL	SG	SG
Belorussian	PL	PL	SG	SG
Russian	PL	PL	short form PL 97%	SG
			long form SG 89%	SG
Slovak	PL	PL	SG	SG
Group 3	**finite verb**	**participle**	**adjective**	**|| noun**
Icelandic	PL	n.a.	PL / SG	n.a.
Lower Sorbian	PL	PL	PL / SG	SG
Macedonian	PL	PL	(PL) / SG	SG
Bulgarian	PL	PL / SG	SG	SG
Upper Sorbian	PL	(PL) / SG	(PL) / SG	SG
Polish dialects	PL	PL / SG	PL / SG	SG
BCS	PL	PL / (SG)	PL / (SG)	SG
Slovenian	PL	PL / (SG)	PL / (SG)	SG

Table 5.2: Predicate Hierarchy effects

In the following section, we will review additional data from the literature which suggest that natural gender and number agreement with honorific pronouns is possible even in languages that mainly reject this possibility, such is the case with standard BCS. We will also explore what sort of theoretical problems the patterns above might pose and what potential directions a satisfactory analysis of these data should take.

5.2 Theoretical problems

Abstracting away from the fact that certain dialects of BCS allow semantic agreement in order to be able to critically evaluate the arguments from the previous literature, in the rest of this section, let us follow Wechsler (2011); Wechsler and Hahm (2011); Despić (2017) in treating BCS as a language where agreement in semantic features with the honorific pronoun is disallowed. This has the benefit of allowing us to isolate two extreme types of languages – the ones in which all agreement targets (apart from finite verbs) show semantic agreement with the honorific pronoun (e.g. Czech (163), French (164)–(166), some Italian dialects (167), Ro-

manian (168)–(169), Modern Greek (170)–(171)) and those in which all predicates (apart from the noun) must agree in grammatical plural number (e.g. BCS (177)).
The basic questions that the data in the previous section pose for the theory of agreement are (i) whether grammatical (and/or natural) gender are encoded on pronouns, and if the answer is yes, how exactly are they encoded if they are not visible in the pronouns' morphology? (ii) Furthermore, if gender features do in fact exist on pronouns, does this mean that in mixed agreement languages these are natural gender features, but in uniform agreement languages the honorific pronoun carries inherent grammatical masculine gender and plural number: [*γ*:M,#:pl]? Or is the masculine feature the result of default agreement? (iii) Finally, what principles of agreement force natural gender and number agreement on participles and adjectives in mixed agreement languages, while restricting uniform agreement languages only to formal agreement? In the following sections, we will look at each of these three questions more closely.

5.2.1 Are gender and number features encoded on pronouns?

There is evidence to suggest that local (i.e. 1st and 2nd) person pronouns do carry gender features in the languages under our survey. Even in languages that prefer grammatical agreement with the honorific pronoun, such as BCS, local person pronouns normally trigger gender agreement on predicates, as in (189).[71]

(189) a. Ja sam umorna.
I.1.SG aux.1.SG tired.F.SG
'I (female referent) am tired.'

b. Ti si umoran.
you.2.SG aux.2.SG tired.M.SG
'You (male referent) are tired.'

c. Vi ste umorne.
you.2.PL aux.2.PL tired.F.PL
'You (female referents) are tired.'

Even though gender agreement with local person pronouns is a general feature of this language, we have seen in (177) above that with the second person plural pronoun used for polite address, natural gender agreement is ungrammatical (or at least, highly dispreferred) (190a). This might then suggest that polite pronouns do not contain natural gender and singular number features after all. However, even though natural gender agreement is highly dispreferred or for most speakers ungrammatical in BCS with primary predicates, secondary predicates do show gender agreement and sentences in (190b-c) are grammatical for all speakers (cf. Wechsler 2011; Wechsler and Hahm 2011; Despić 2017).

[71] See Nevins (2011*a*); Wechsler (2011); Wechsler and Hahm (2011); Ackema and Neeleman (2013); Parrott (2015); Despić (2017) for various accounts proposed to explain and capture this phenomenon, most of which we return to in later sections, hence the discussion thereof will be postponed until then.

(190) a. Vi, Slavice, ste {pažljivi / **?#pažljiva**}.
you.2.PL Slavica aux.2.PL attentive.M.PL / attentive.F.SG
'You, Slavica, are attentive.'

b. Slavice, ja Vas smatram {*pažljivim / **pažljivom**}.
Slavica I you.2.PL.ACC consider.1.SG attentive.M.PL.INS / attentive.F.SG.INS
'Slavica, I consider you attentive.'

c. Draga Ana, juče sam vas video potpuno {*pijane / **pijanu**}.
dear Ana yesterday aux.1.SG you.2.PL.ACC seen completely drunk.PL.ACC / drunk.F.SG.ACC
'Dear Ana, yesterday I saw you (one formal female addressee) completely drunk.'
(Despić 2017)

Examples (189)–(190) demonstrate that local person pronouns, as well as the honorific pronoun do in fact trigger gender agreement in a language such as BCS in certain environments. Note that agreement in natural gender and number is possible with the honorific pronoun only if the pronoun is not in the nominative case. Thus the nominative honorific pronoun in (191a) triggers formal plural agreement, while the non-nominative pronoun in (191b) obligatorily triggers natural gender agreement.

(191) a. **Vi**, Slavice, ste {vozili / ?#vozila} {**pijani** / *pijana}.
you.2.PL.NOM Slavica are.2.PL driven.M.PL / driven.F.SG drunk.M.PL.NOM / drunk.F.SG.NOM
'You, Slavica, drove drunk.'

b. Draga Ana, juče sam **vas** video potpuno {*pijane / **pijanu**}.
dear Ana yesterday be.1.SG you.2.PL.ACC seen completely drunk.PL.ACC / drunk.F.SG.ACC
'Dear Ana, yesterday I saw you (one formal female addressee) completely drunk.'
(Despić 2017)

For further detail and patterns, see Wechsler (2011); Wechsler and Hahm (2011). What is worth mentioning is that in examples such as those in (191) semantic agreement might have an indirect source (e.g. a *pro* subject of the secondary predicate small clause) in (191b). Since I will focus primarily on deriving the basic patterns on predicates that make up the Predicate Hierarchy, the issue of agreement on secondary predicates and the interaction between case and the possibility of semantic agreement, even though exciting and very important, will be left aside as a matter for future research.

In conclusion, the data presented here support the assumption that pronouns can encode gender features. The remaining questions are what kind of features they encode and how the features participate in agreement.

5.2.2 How are number and gender features encoded on pronouns?

A recent proposal for encoding gender and number features on pronouns was put forward by Wechsler (2011); Wechsler and Hahm (2011), under the HPSG framework. In their theory, the distinction is made between two sets of features: *concord features*, which denote purely formal properties of an element and which are often represented in the element's form (case, number and gender) and *index features* (person, number and gender), more closely tied to semantics and related to an element's referential index, e.g. whether a noun denotes a male or female entity (cf. Wechsler and Zlatić 2003). Under this account, a pronoun contains both sets of features. *Concord features* are copied by agreement targets which themselves also express gender and number (but no person) features, i.e. adjectives and participles, while *index features* participate in agreement between the pronoun and the finite verb, which agrees in person and number.

Recall that the (nominative) honorific pronoun *vi* in BCS always triggers grammatical plural number and masculine gender agreement on the agreement targets, as repeated in (192).

a. Vi, Slavice, ste {pažljivi / **?#pažljiva**}.
you.2.PL Slavica aux.2.PL attentive.M.PL / attentive.F.SG
'You, Slavica, are attentive.'

According to Wechsler (2011); Wechsler and Hahm (2011), this is the result of the honorific pronoun having both *concord* masculine plural [γ:M,#:pl] features, copied by adjectives and participles and *index* 2nd person masculine plural [π:2,γ:M,#:pl] features, copied by finite verbs. In contrast, the honorific pronoun in mixed agreement languages lacks *concord* features, while its *index* features are specified as [π:2,γ:M,#:pl].

(192) a. BCS-type languages: *concord* [γ:M,#:pl], *index* [π:2,γ:M,#:pl]
b. French-type languages: *concord* [none], *index* [π:2,γ:M,#:pl]

In sum, the difference between French-type languages and BCS-type languages lies in the feature specification of the honorific pronouns, such that in the latter type of languages the honorific pronoun is specified with formal masculine plural features, which are copied by participles and adjectives.[72]

The assumption that masculine gender exists as a proper feature on the honorific pronoun has been challenged by Despić (2017). The first problem he identifies is that if the honorific pronoun were to encode masculine gender as a concord feature in BCS, we would expect to see it in the pronoun's morphology, since Wechsler (2011); Wechsler and Hahm (2011) assume that concord features can be read off the nominal's form. However, the honorific pronoun in BCS does not give out any such formal information.

Furthermore, agreement properties of the polite pronoun indicate that not only can it not en-

[72] The natural gender and number agreement in is the result of a special principle, named the Agreement Marking Principle, to which we return in the following section.

code grammatical masculine gender, it in fact *must not* bear this feature. The evidence comes from agreement in coordination. In BCS, any singular conjoined nouns of mixed gender trigger default masculine plural agreement (193). Two feminine nouns, however, trigger feminine plural agreement (194).

(193) Brat i sestra su čitali knjigu.
brother.M.SG and sister.F.SG aux.3.PL read.M.PL book
'The brother and sister were reading a book.'

(194) Ana i Ljubica su stigle.
Ana.F.SG and Ljubica.F.SG aux.3.PL arrived.F.PL
'Ana and Ljubica arrived.'

The honorific pronoun seems to pattern with feminine and not with masculine nouns in this case. If we coordinate two honorific pronouns which refer to a single female person each, the result will be feminine agreement, just like in coordination of two feminine nouns in (194).

(195) Vi (Ana) i Vi (Ljubice) ste bile zauzete.
you.2.PL Ana and you.2.PL Ljubica be.2.PL been.F.PL busy.F.PL
'You Ana and you Ljubica were busy.'

However, two conjoined feminine nouns can also trigger default masculine agreement (196b) (sentences taken from Despić (2017) and adapted):

(196) a. Vi (Slavice) i Vi (Bojana) ste juče išle u šetnju.
you.2.PL (Slavica) and you.2.PL (Bojana) are.2.PL yesterday gone.F.PL in walk
'You Slavica and you Bojana went for a walk yesterday.'

b. Vi (Slavice) i Vi (Bojana) ste juče išli u šetnju.
you.2.PL (Slavica) and you.2.PL (Bojana) are.2.PL yesterday gone.M.PL in walk
'You Slavica and you Bojana went for a walk yesterday.'

According to Despić (2017), the feminine agreement on the participle in (195) suggests that both pronouns must have semantic feminine gender. Crucially, they also cannot have masculine gender features whatsoever. If at least one of them did, it would inevitably yield masculine agreement on the participle. As for the masculine agreement in (196b), Despić (2017) argues that this is the result of default agreement (the particular implementation depends on the theory of conjunct agreement; see this paper for further detail).

Based on the arguments above, I follow Despić (2017) in treating masculine not as a feature on the honorific pronoun, but as a default value resulting from failure to find grammatical gender on the noun.

5.2.3 How is variation in agreement derived?

Wechsler (2011); Wechsler and Hahm (2011) argue for a 'different pronoun hypothesis' as the cause of variation between the French-type and the BCS-type languages. Since the honorific pronoun in BCS has the masculine concord gender, this feature will control agreement on the participle and the predicate adjectives. In contrast, French honorific pronouns are deficient in concord features, thus participles and adjectives have nothing to copy from them. What drives agreement in this language in this configuration is the *Agreement Marking Principle*:

(197) *Agreement Marking Principle*:
'Agreement is driven by a syntactic feature of the controller, if the controller has such a feature. If the controller lacks such a feature, then the target agreement inflection is semantically interpreted as characterizing the controller denotation.'
(Wechsler 2011:1009).

This principle ensures that if the pronoun lacks concord gender features, it will not be interpreted as referring to a male or a female, but rather the gender agreement marking on the agreement target is what contributes the semantic interpretation. Thus if a participle or an adjective shows natural gender agreement (as is the case in French), the source of these features is not the pronoun since no features exist on it. As a result of this 'failure of agreement', the inflection on the agreement target must be interpreted. Through this process, the honorific pronoun also eventually receives its interpretation as referring to a male or a female (Wechsler 2011:1009; see also Ackema and Neeleman 2013 for a proposal along similar lines). However, since this analysis is based on the wrong premise that BCS honorific pronoun contains masculine gender feature, as disputed by Despić (2017), I do not follow its basic idea. Instead, I will develop a proposal below that keeps the structure of the honorific pronoun constant across different languages, while the cause of variation will be ascribed to the mechanism of Agree. As an alternative to Wechsler and Hahm (2011), Despić (2017) proposes that natural gender features (i.e. semantic gender) are present on the local person pronouns, but they are never represented in the pronoun's form, which makes them exclusively semantic features. The proposal is that each of the pronouns below encodes *formal* person and number features, as well as *semantic* gender and number, which in all the cases matches the formal number of the pronoun (i.e. singular in (198a-b) and plural in (198c-d)).

(198) a. Ja sam umorna.
I.1.SG aux.1.SG tired.F.SG
'I (female referent) am tired.' *formal* [π:1,#:sg] *semantic* [γ:F, #:sg]

b. Ti si umoran.
you.2.SG aux.2.SG tired.M.SG
'You (male referent) are tired.' *formal* [π:2,#:sg] *semantic* [γ:M, #:sg]

c. Mi smo umorne.
we.1.PL aux.1.PL tired.F.PL
'We (female referents) are tired.' *formal* [π:1,#:pl] *semantic* [γ:F, #:pl]

d. Vi ste umorne.
you.2.PL aux.2.PL tired.F.PL
'You (female referents) are tired.' *formal* [π:2,#:pl] *semantic* [γ:F, #:pl]

With the honorific pronoun, however, the formal features [π:2,#:pl] do not match the semantic ones [γ:F/M, #:sg]. In a language such as BCS, the predicate will copy the formal plural number, but then agreement becomes restricted only to formal features and the semantic gender cannot be copied. A default masculine exponent is inserted in the absence of gender a feature to satisfy the well-formedness requirements of a language. On the other hand, a predicate in a language like French will copy the semantic number and this will force it to be limited only to semantic features, as a result of which it will copy the semantic gender of the pronoun as well.

What is left unsolved in this account is how semantic and formal number features are represented and in what way they are exactly encoded on the pronoun. Moreover, what forces agreement targets in French, as opposed to ones in BCS to copy exclusively semantic features, is another matter left without an explicit proposal in this account. In the remainder of this part, I will propose an account that will offer a derivational account which manages to overcome exactly these problems.

Chapter 6

A derivational account of Predicate Hierarchy effects

Having established that pronouns can carry natural gender and number features just like nouns do, the question is how these observations fit into the system of agreement developed so far. Since the Predicate Hierarchy and Agreement Hierarchy both basically describe the same problem of forcing or limiting formal or semantic agreement to particular agreement target types, it would be desirable to explain both phenomena under the same account. In the following chapters, this is exactly what we are going to do.

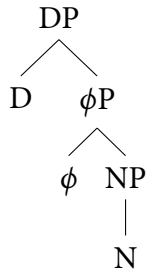
We will see that there is no need to alter the Agree mechanism developed so far, as it can straightforwardly derive the patterns of agreement on different predicates. Since Predicate Hierarchy deals more with formal vs. semantic number agreement, the derivations will mostly be concerned with deriving formal and semantic agreement patterns, but gender agreement will play an important role nevertheless. What needs to be added to the system is the proper locus of semantic number (which will be the *n*, as suggested above in Section 4.2.1), as well as some assumptions on the structure and feature specification of pronouns, especially the honorific one, which will be the hybrid agreement controller based on which the Predicate Hierarchy effects will be illustrated. These assumptions will be laid out throughout Section 6.1. The explanations for the mixed agreement effects, together with the derivations of the different patterns will be provided for finite verbs in Section 6.3, for participles in 6.4, for predicate adjectives in Section 6.5 and for predicate nouns in 6.6. Most of the discussion will be based on data from BCS, upon which it will be shown how the analysis extends to the patterns identified in the literature so far and summarised in Table 5.1 above.

6.1 Theoretical assumptions

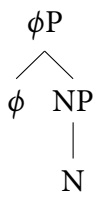
6.1.1 Structure and featural content of pronouns

In order to integrate pronouns in the system developed so far, their similarities with an differences from regular nouns deserve closer attention. In developing a proposal to account for this issue, I will rely mostly on the account of Déchaine and Wiltschko (2002) for the internal structure of pronouns. Déchaine and Wiltschko (2002) argue that pronoun is not a primitive notion, since its internal structure can be articulated to a greater or lesser degree. They propose three different possibilities for the structure of pronouns, exemplified below, arguing that different structures occur not only in different languages, but also within the same one. The NP contains the inherent information on the noun's form, the ϕP carries ϕ-features, while the DP establishes referential properties of the pronoun. English 1st and 2nd person pronouns, for instance, are argued to be pro-DPs, while 3rd person pronouns are ϕPs.

(199) Pro-DP



(200) Pro-ϕP



(201) Pro-NP

In order for a pronoun to qualify as a Pro-DP, it must fulfil a couple of criteria. First, it needs to allow overt lexical material to appear next to it, as in *we linguists* in English (where the noun *linguists* is arguably the overt realisation of the NP, and *we* of D). Furthermore, its interpretation should be definite. A Pro-DP is referential and it behaves as an R-expression, and therefore does not behave like a bound variable, which means that it cannot license sloppy readings. Finally, it cannot be used as a predicate, but only as an argument.

In order to develop a proposal for the structure of the honorific pronoun in the languages under survey, I will take BCS as a case study, demonstrating that pronouns in this language are pro-DPs. I show that BCS personal pronouns meet the necessary criteria, leading to the conclusion that they should be treated as DPs, which justifies their treatment on a par with all other nouns in the language. Pronouns in BCS allow for other NP material to co-occur with them, as exemplified in (202)–(203). By assumption, this overt material can be treated as the overt realisation of the NP part.

(202) a. ja budala
I fool

b. ti pametnica
you smart-girl

c. on neradnik
he non-worker

(203) a. mi lingvisti
we linguists

b. vi pametnice
you smart-girls

c. oni neradnici
they non-workers

Overt material, in the form of adjectives and demonstratives, can also appear in front of the pronoun (cf. Pereltsvaig 2007:28 for Russian):

(204) a. Jaka ja mogu to prevazići.
strong.F.SG I can.1.SG that overcome
'A strong me can overcome this.'

b. Ja volim onog tebe kojeg poznajem.
I love.1.SG that.M.SG you who know.1.SG
'I love that you that I know.' (cf. pronouns in Russian; Pereltsvaig 2007:28)

Furthermore, pronouns in BCS cannot function as bound variables. They do not allow sloppy readings under ellipsis:[73]

(205) Jovan je pozvao svoju devojku na slavu, a **nju** je pozvao i Danilo.
Jovan is invited his girlfriend on family.celebration and her is invited also Danilo
'Jovan invited his girlfriend to the family patron saint's celebration, and Danilo invited her (Jovan's girlfriend) too.'
*'Jovan invited his girlfriend to the family patron saint's celebration, and Danilo invited her (Danilo's girlfriend) too.' (Runić 2014:99,124)

Finally, BCS pronouns can function as arguments (206), but their status as a predicate is slightly more complicated, as they seem to be allowed in this position as well, contrary to the expectation of Déchaine and Wiltschko (2002). Example (207) demonstrates that the 1st person pronoun *ja* can in principle function as a predicate. While this test might not seem like the most conclusive way to confirm the DP status of pronouns in BCS, note that the very claim that DPs cannot function as predicates, put forward by Longobardi (1994), and followed by Déchaine and Wiltschko (2002) has been disputed in the literature (see for instance

[73] Just for the sake of comparison, clitics in BCS allow sloppy readings in the same context, which could indicate that clitics are pro-PhiPs:

(i) Jovan je pozvao svoju devojku na slavu, a pozvao **ju** je i Danilo.
Jovan is invited his girlfriend on family.celebration and invited her is also Danilo
'Jovan invited his girlfriend to the family patron saint's celebration, and Danilo invited her (Jovan's girlfriend) too.'
'Jovan invited his girlfriend to the family patron saint's celebration, and Danilo invited her (Danilo's girlfriend) too.'
(Runić 2014:99,124)

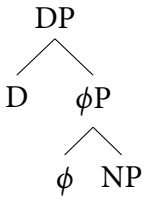
Pereltsvaig 2007:21f. and references therein). I therefore follow Pereltsvaig (2007) in assuming that predicate nominals in Slavic can be full DPs.

(206) Video sam tebe.
seen am you
'I saw you.'

(207) Ti si ja u ovoj situaciji. Šta bi sledeće uradio?
you aux.2.sg I in this situation what would.2.sg next do.prt.m.sg
'You are me in this situaton. What would you do next?'

In sum, based on the evidence above, I treat pronouns as pro-DPs in BCS.[74] As Pro-DPs, in the Déchaine and Wiltschko (2002) system, they should have a structure corresponding to the one in (208).

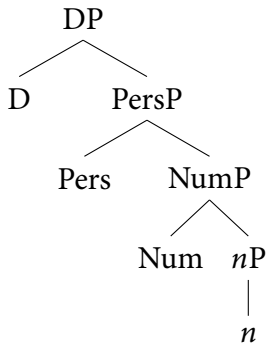
(208) Pro-DP



However, since NP and ϕP are not sufficient to explain the distribution of features on pronouns, I propose an update in line with the findings of our system so far. First, instead of NP, I assume pronouns, like nouns, have an *n*P as their core (but see Moskal 2015; van Urk 2016 for arguments that at the core of a pronoun is actually a Pers(on)P, as opposed to nouns, which have *n*P). Furthermore, Déchaine and Wiltschko (2002) propose that a composite ϕ head is the locus of all ϕ-features of a pronoun. However, based on the evidence in the literature for the necessity of separation of ϕ-features into different functional projections, I follow van Koppen (2012), who builds on the work of Pollock (1989); Shlonsky (1989); Poletto (2000); Platzack (2004) in assuming that person and number are encoded on two different projections, where person is higher than number. As a consequence, this splits the ϕP into NumP and Pers(on)P:

[74] Note that such a proposal is also in line with Progovac (1998) (see also Franks and Pereltsvaig 2004), who assumes that BCS pronouns are generated in N and move to D, collecting the inflectional morphology along the way from the Agr(eement) projections. However, I do not adopt this approach entirely since it is not clear whether this is exactly the case. BCS pronouns allow overt material to follow them (202)–(203), and assuming that the overt material also originates in N, the two should be mutually exclusive. Conversely, overt material can precede them as well (204), which would also be unexpected if they are located in D.

(209) Structure of pronouns in BCS:



I further assume that PersP is projected only if it carries a [π:Participant] feature (the PersP can be thought of as a version of Part(icipant)P of Arregi and Nevins (2012:53); the idea is similar, that local person pronouns and clitics have a more complex structure than their 3rd person counterparts). The internal structure of person features is orthogonal to the current investigations, so I will keep the discussion on them as simple as possible. Assume, for the sake of explicitness, that 1st person involves the features [π:Participant,Speaker], while the 2nd person only has the feature [π:Participant]. These features would be encoded on PersP. The third person would not have the [π:Participant] feature, therefore PartP would not be projected with 3rd person pronouns. In the following section, we will see how this specification interacts with gender specification of the pronoun.

6.1.2 Gender feature encoding on pronouns

As pointed out throughout Section 5.2, pronouns in BCS trigger gender agreement on agreement targets that express gender features. First and second person pronouns control agreement that reflects the natural gender and number of the referent of the pronoun (i.e. the speaker or the addressee):

(210) a. Ja sam umorna.
I.1.SG aux.1.SG tired.F.SG
'I (female referent) am tired.'

b. Ti si umoran.
you.2.SG aux.2.SG tired.M.SG
'You (male referent) are tired.'

c. Mi smo umorne.
we.1.PL aux.1.PL tired.F.PL
'We (female referents) are tired.'

d. Vi ste umorni.
you.2.PL aux.2.PL tired.M.PL
'You (male referents) are tired.'

Crucially, the gender these pronouns bear seems to be natural gender, since usually only an

animate entity can be a speaker or an addressee. Even in an imaginary situation in which inanimate entities (e.g. chairs and tables) would speak in 1st or 2nd person to each other, they would have to be personified by assigning them animate features. Thus in this case, they would be treated as animate entities and assigned natural gender accordingly. In contrast, 3rd person pronouns can be used to refer to either animate or inanimate entities (211). This suggests that 3rd person pronouns can encode both natural and grammatical gender.

(211) a. Srela sam Slavicu. Ona me nije prepoznala.
met.1.SG aux.1.SG Slavica.F.SG she me not.aux.3.SG recognised.F.SG
'I met Slavica. She didn't recognise me.'

b. Srela sam Nevena. On me nije prepoznao.
met.1.SG aux.1.SG Neven.M.SG he me not.aux.3.SG recognised.M.SG
'I met Neven. He didn't recognise me.'

c. Kupila sam novu stolicu. Ona je udobna.
bought1.SG aux.1.SG new chair.F.SG she aux.3.SG comfortable.F.SG
'I bought a new chair. It (lit. she) is comfortable.'

d. Kupila sam novi radni sto. On je vrlo praktičan.
bought1.SG aux.1.SG new working table.M.SG he aux.3.SG very practical.M.SG
'I bought a new desk. It (lit. he) is very practical.'

The observation that pronouns in languages such as Slavic (e.g. Czech in (212b)), as well as Romance (e.g. Brazilian Portuguese in (212a)) encode gender features has not gone unnoticed in the literature.

(212) a. Eu estou bêbada.
I.1.SG aux.stage-level.1.SG drunk.F.SG
'I (female referent) am drunk. [Brazilian Portuguese] (Nevins 2011*a*:430)

b. Já jsem krásný a ty jsi talentovaná.
I.1.SG aux.1.SG beautiful.M.SG and you.2.SG aux.2.SG talented.F.SG
I (male referent) am beautiful and you (female referent) are talented.' [Czech] (Parrott 2015:216)

Building on such evidence from Romance and Slavic, Nevins (2011*a*) and Parrott (2015), argue that agreement in gender is the result of the presence of a gender feature on the pronoun. However, this feature is not present in the pronoun's morphology. According to them, the morphological absence of gender features on 1st and 2nd person pronouns is the result of an Impoverishment operation which deletes gender features in the presence of the features such as [Participant]:

(213) [±fem] [±neut] → ∅ / D[_+part] (Parrott 2015:221)

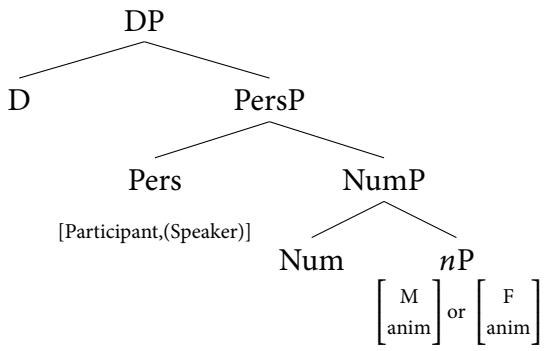
As argued by Nevins (2011*a*:430), 'the feature [+/-feminine] must be present on the subject pronoun in order to trigger feminine concord on the adjective. However, it fails to show up on the agreeing auxiliary or on the pronoun itself. Notably, both of these items are ones where

the feature of 1st person (namely, [+/-author]) is present.' The deletion of gender features according to these authors is therefore the result of markedness-driven impoverishment (see also Nevins and Parrott 2010; Despić 2017). However, while Parrott (2015) claims that gender is deleted in the context of the feature [Particpant] in Slavic, Nevins (2011*a*:430,fn9) formulates the rule more carefully for Brazilian Portuguese, claiming that only the most marked person feature [Author] triggers Impoverishment, while 'the direction of markedness [with respect to second person] is not entirely clear, perhaps because of politeness-based honorification]'. Therefore, the influence of second person features on gender Impoverishment is not as clear as that of the 1st person. Moreover, the Impoverishment rules suggested by these authors apply only in one way – they can explain why the targets and controllers that express person features do not show gender distinctions, but they have very little to say about why the targets and controllers that show gender and number (in languages under our survey, but not universally) do not show person distinctions.

I advocate a different approach, in which gender features are present even on 1st and 2nd person pronouns, but these are not the kind of features that necessarily must appear in the morphology, and, accordingly, do not have to undergo post-syntactic deletion. I propose that even though gender features are not morphologically present on 1st and 2nd person pronouns, they are present in the form of natural gender on the *n*P.[75] In that sense, *natural gender* features are *not incompatible with person* features. However, *grammatical gender* features seem to be morphologically *incompatible* with person features (in the languages in question here). I model this by assuming that 1st and 2nd person pronouns actually cannot have a GenP, the phrase which encodes grammatical gender.

These assumptions work together in the following way. 1st and 2nd person pronouns have the structure as in (214). Their PersP is merged above the NumP. The *n*P carries natural gender features (either [γ:M[anim]] or [γ:F[anim]]), while their PersP carries the features [π:Participant[Speaker]] for 1st person or [π:Participant] for 2nd person.

(214) Local-person pronouns:

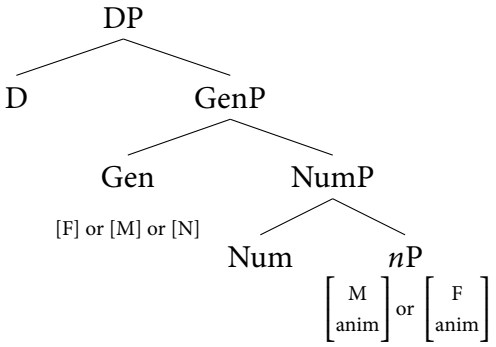


Crucially, PersP is absent if it does not carry a [π:Participant] feature. This in turn means that

[75] Recall that this is the same assumption as the one of Despić (2017).

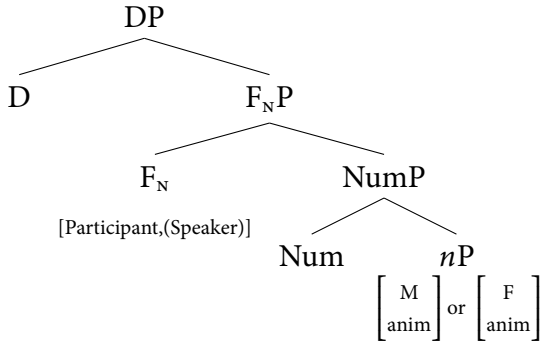
PersP is absent with 3rd person pronouns, which enables treating 3rd person as the lack of person (Béjar and Řezáč 2003; Anagnostopoulou 2005; Adger and Harbour 2007). Moreover, since in (214) the PersP actually selects for NumP, GenP is automatically excluded from such a configuration, considering the fact that GenP also selects for the NumP, which makes the two projections, GenP and PersP, mutually exclusive. As a consequence, 1st and 2nd person pronouns cannot have grammatical gender because GenP can never be merged where PersP is present, and conversely, 3rd person pronouns contain a GenP, but then they will lack PersP, and accordingly, person features. GenP and PersP thus seem to be in complementary distribution. The structure of 3rd person pronouns is then as in (215), which basically reflects the structure of other nominals.

(215) Third-person pronouns:

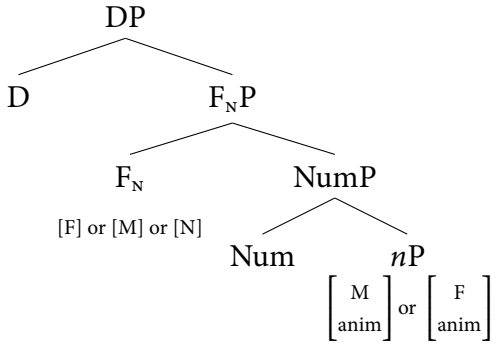


Another way of thinking about the complementarity of GenP and PersP is to view the features that they host, grammatical gender and person, as two complementary categories, such that grammatical gender is actually a counterpart to person. In other words, in the languages in our sample, grammatical gender can also be seen as compensating for the lack of person. This indicates that instead of postulating two independent category heads, a single head can be assumed, which would host the relevant features. Since grammatical gender and person are features reflected in the morphology of a nominal category in languages under survey, the head that hosts them should also be the node that contributes to the morphological realisation of ϕ-features. For the sake of concreteness, Baker's (2008) notation F_N could be adopted. This head can be assumed to introduce either the [M/F/N] gender features, or [Participant(Speaker)] features, but never both at the same time. If this analytical option is adopted, local person pronouns can be represented as in (216), while 3rd person pronouns may be structured as shown in (217):

(216) Local-person pronouns:



(217) Third-person pronouns:



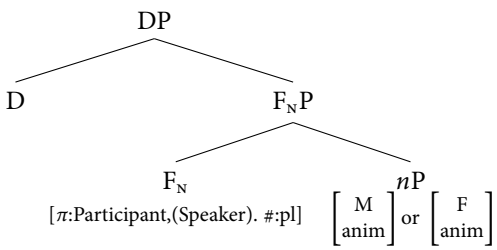
However, there are languages that do not simply conflate grammatical gender and person, but that actually show gender distinctions even with local person (18 languages identified by the World Atlas of Language Structures, see Section 7.1 for further detail), which indicates that the idea of [π:Participant] and [γ:M/F/N] being mutually exclusive does not seem to be a universal property of languages, but it only seems to hold in the languages under discussion here.[76] Therefore, in the remainder of the analysis, I will continue using the notation PersP in the interest of explicitness and familiarity, since grammatical gender will not play a role in the derivations, while noting that the analysis prevents the structures in (217) and (216) to be adopted as notational variants.[77]

Treating grammatical gender and person as mutually exclusive receives further justification in the morphology of BCS pronouns, exemplified in (218). From their morphology, we can

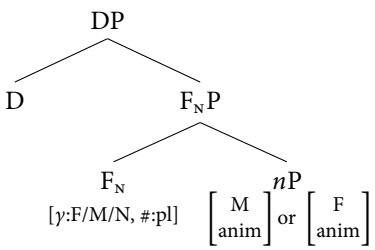
[76] Another potential argument against viewing grammatical gender and person as two sides of the same coin and considering splitting them across different syntactic heads is their role in the grammar – while person features are often analysed as introducing a referential index (Sudo 2012), grammatical gender is simply a morphological property of a noun that does not carry any semantic information.

[77] Moreover, nothing in the analysis would change if number were also to be represented together with the grammatical gender and person on the same functional projection. Structures in the examples (216) and (217) could in principle be represented as (i) and (ii), respectively. Such a structure would give the same results of agreement with respect to the CAD, since if one of the features is targeted, the rest of them can still be targeted by a later Agree operation as they are not lower in the structure. Moreover, it would enable a clear separation of the domain of semantic features (the *n*P) and purely formal features visible to the morphology (the F_nP). However, since there is strong evidence in the literature for Num being a separate projection (see, for instance, Harbour 2008; Landau 2016 and references therein), hosting not only plural, but also various other kinds of number features (e.g. collective, atomic, etc.), I will continue assuming number to be a separate projection.

(i) Local-person pronouns:



(ii) Third-person pronouns:



see that third person pronouns distinguish between all three genders, masculine, feminine and neuter, both in the singular and in the plural, while the first and second person pronouns have a single form and do not show gender distinctions.

(218)

π	#	
	sg	pl
1	ja	mi
2	ti	vi
3	on-$\varnothing_{m}$	on-i_{m}
	on-a_{f}	on-e_{f}
	on-o_{n}	on-a_{n}

Table 6.1: Personal pronouns in BCS

The suffixes on the personal pronouns are the typical gender suffixes present on nouns as well. The typical masculine nouns belonging to declension class I have the -∅ suffix, just like the masculine pronoun (cf. *on-∅* 'he' vs. *dečak-∅* 'boy' below), feminine nouns typically end in *-a*, just like the feminine pronoun (cf. *on-a* vs. *devojk-a* 'girl' below) and neuter nouns end in *-o* (or *-e*, which we will put aside), just like the neuter pronoun (cf. *on-o* vs. *kril-o* 'wing' below).

(219)

sg		pl	
pronoun	noun	pronoun	noun
on-$\varnothing_{m.sg}$	dečak -$\varnothing_{m.sg}$	on-$i_{m.pl}$	dečac-$i_{m.pl}$
on-$a_{f.sg}$	devojk-$a_{f.sg}$	on-$e_{f.pl}$	devojk-$e_{f.pl}$
on-$o_{n.sg}$	kril-$o_{n.sg}$	on-$a_{n.pl}$	kril-$a_{n.pl}$

Table 6.2: Personal pronoun morphology in BCS

Assuming that NumP and GenP fuse to yield the inflectional suffixes for nouns which contain both grammatical gender and number features, the same logic can be extended to the morphology of 3rd person pronouns. The fusion of the two nodes will yield appropriate suffixes with pronouns and nouns alike. At the same time, his explains the lack of gender morphology on local-person pronouns – since there is no GenP, there is nothing to yield the appropriate gender exponent.

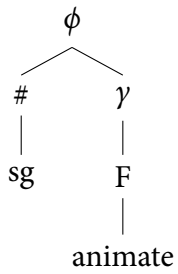
6.1.3 Semantic number encoding and the structure of the honorific pronoun

This section explores how the assumptions developed above combine to yield the structure and feature encoding on the honorific pronoun. The mixed agreement patterns this pronoun is able to trigger make it necessary to explain where and how it encodes both formal person and number features, as well as the natural gender and number.

Under the assumptions above, as a second person pronoun, the honorific pronoun should have the [π:Participant] feature encoded on the PersP, while its [#:pl] feature is present on the NumP. This is what formally makes it a second person pronoun, which is reflected by its morphological shape, as well as in (formal plural) agreement with finite verbs.

Since we have seen that polite pronouns can trigger singular and gender-dependent agreement, the question is where these features are encoded. I propose that feminine or masculine natural gender is present on the *n*P of these pronouns, just like it was proposed in (214) for local person pronouns. There is, however, a crucial difference between the regular local person pronouns and the honorific pronoun. While with the former, the formal number on the NumP matches the semantic number of the referent, with the latter there is a mismatch in the sense that its NumP encodes formal plural, even though the referent is a single entity. Since the singular number denotes the 'natural' or real-world singular number, I assume it is encoded locally with respect to natural gender. Therefore, I pursue the same analytical option applied to natural vs. grammatical number in the discussion of Hebrew in Section 4.2.1, promised to receive further support in the discussion of the Predicate Hierarchy. I assume that natural number is present together with the natural gender on the same *n*. I further propose that natural gender and number features are organised into a feature geometry. Following the Harley and Ritter (2002) feature geometry approach, the two features can be assumed to form a hierarchy such as the one in (220):

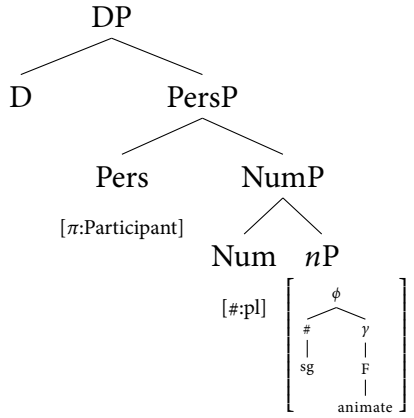
(220)



The hierarchy in (220) essentially models the 'Individuation' node from the geometry of Harley and Ritter (2002), which is the node assumed to encode gender and number together. As mentioned before, similar assumptions were utilized explicitly by Preminger (2014:47), Deal (2015) for the structural representation of person and number with the geometries exactly mirroring those in (220), but such an assumption must also be implicitly present in any other approach

relying on the geometric structure of ϕ-features. Even though feature geometries are assumed to exist on syntactic objects that participate in Agree relations, exactly how the hierarchies are assembled and how they become encoded on syntactic heads is, to the best of my knowledge, not explicitly discussed.[78] As indicated in Section 4.2.1, even though the origin of feature geometries is a fascinating research question, I will leave it for future work. For the purposes of the account, I will assume that such structures are assembled outside the current derivations (either in the lexicon, in the numeration, or on a separate workspace), after which they are connected to the respective heads that host them in syntax. Thus the feature geometries on *n* heads enter the derivation together with the head that hosts them. The CAD then applies only to the host head, but it does not interact with the feature geometry found on it.
With these adjustments in place, the honorific pronoun is then structured as below:

(221) Honorific 2nd person pronoun:



As will become obvious in the derivations that follow, such a configuration makes it necessary to copy all the features that belong to this hierarchy together, i.e. to copy the entire snippet with all its values (cf. Preminger 2014:47), which derives the observation of Despić (2017) that a probe can be valued with either only semantic or only formal features.

6.1.4 Review of assumptions on agreement

Apart from the representational assumptions outlined in the previous section, in order to derive the agreement patterns on different types of predicates, I assume the system of agreement developed so far, summarised by the following points:

1. **Feature hierarchy:** Natural gender is a featural composite consisting of values [F/M [anim]] in a hierarchical relationship (cf. Harley and Ritter 2002). It is thus featurally

[78] As mentioned in Part 1, in their original formulation of the proposal for feature geometries, Harley and Ritter (2002:482) disregard the structure of the features in syntax and their role in agreement, focusing instead on the morphological realisation of these features.

more complex than grammatical gender, as it includes an additional animacy specification.

2. **Relativized probing:** The gender probe can be relativized (cf. Béjar 2003; Béjar and Řezáč 2009; Georgi 2012, 2013; Nevins 2007, 2011*b*; Preminger 2014) to look for natural gender features. If so, it is specified as [$*\gamma$:□[anim:□]$*$].

3. **Cyclic Agree:** If the probe does not find a single element that contains all the corresponding valued gender features, Agree cannot result in valuation. This triggers the second cycle of Agree in which the probe gets reduced to the root node, and in gender agreement, it only looks for [$*\gamma$:□$*$] features (Béjar 2003; Béjar and Řezáč 2009; Preminger 2014).

4. **Order of operations on the same head:** Agree operations triggered by a single head are ordered, but the precise order of such operations can be underspecified in a language. As a result, Gender Agree can precede or follow Number Agree (Müller 2009; Georgi 2014; Assmann et al. 2015).

5. **Locality of Agree:** Regulated by the following condition:

   (222) *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.

6. **Failed Agree:** Agree is obligatorily triggered in appropriate circumstances, but its failure to find a matching goal does not lead to a crash, but to default valuation of the features in question (Preminger 2014).

I will proceed by applying these assumptions to agreement with different types of predicates involved in the Predicate Hierarchy, starting from finite verbs in the following section.

6.2 Agreement on the DP level

In previous chapters we have seen that applying the agreement mechanism DP-internally can result in two different agreement patterns. This was achieved by letting D perform Gender Agree and Number Agree operations in any order. Person Agree was noticeably disregarded in previous discussions, since the DPs in question did not possess a [π:Participant] feature (or its dependents). The presence of this feature on pronouns raises the question of whether D performs Person Agree as well, and if so, how it is ordered with respect to Number and Gender Agree.

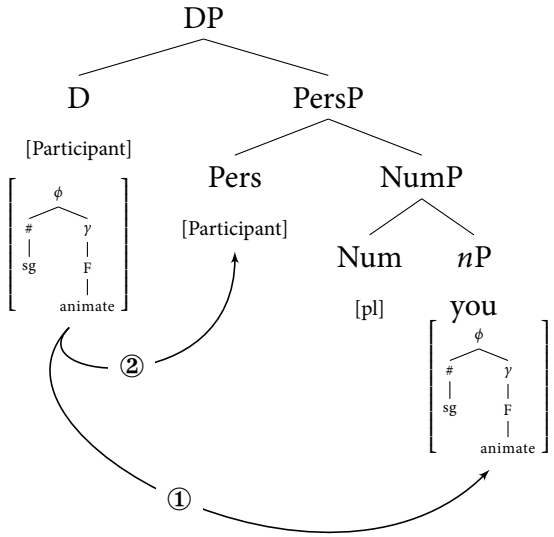
Focusing our attention only to the languages summarised by Wechsler (2011:1003) in Table 5.1, and assuming that the morphology they show on D-elements (articles, demonstratives, etc.) reflects the features they agree in, it seems like D does not necessarily need to agree in person features. Articles in languages such as French, Romanian, Modern Greek and Icelandic, and D elements in articleless Slavic languages only show person and number agreement with their head noun. However, following Baker (2008:114), I will assume that D in fact has a person probe as well, which enables it to unify all the ϕ-features of its internal functional phrases into one node (see also Landau 2016). As suggested by Baker (2008:114), the fact that articles, determiners, demonstratives etc. do not show any person features may be related to the fact that they usually occur with common nouns, which are third person (or in my system, they lack the person feature). Combinations where articles take pronouns as their arguments are extremely rare (*the we, *every I, etc.). Moreover, in the cases where D was combined with a noun, it was overtly realised as a lexical element. With pronouns, I assume that it does not have an overt realisation, but rather the whole combination of *n*, Num and Pers is realised as the corresponding pronoun.

Assuming that Person Agree is performed alongside Gender and Number Agree by D, it is important to explore how it is ordered with respect to the other two operations. Given my system, the possible logical combinations in agreement with the honorific pronoun and the results they would yield are presented in (223).

(223) a. Gender Agree > Number Agree > Person Agree ⇒ [γ:F/M,anim, #:sg, π:Participant]
b. Gender Agree > Person Agree > Number Agree ⇒ [γ:F/M,anim, #:sg, π:Participant]
c. Number Agree > Gender Agree > Person Agree ⇒ [γ:∅, #:pl, π:Participant]
d. Number Agree > Person Agree > Gender Agree ⇒ [γ:∅, #:pl, π:Participant]
e. Person Agree > Gender Agree > Number Agree ⇒ [γ:∅, #:∅, π:Participant]
f. Person Agree > Number Agree > Gender Agree ⇒ [γ:∅, #:∅, π:Participant]

As (223a-b) indicate, if Gender Agree always precedes the other two operations, D's gender feature will always be valued with the natural gender of the pronoun. The gender probe will encounter the matching features on the *n*P, and during valuation, the gender feature will pied-pipe the number value onto the D head (see Section 6.4 for a more detailed argumentation behind this assumption). This step will render Number Agree unnecessary, since the unvalued number feature of D will be automatically supplied. Person Agree would apply afterwards, and copy the features from PersP, respecting the CAD. As a result, given any order in which Gender Agree applies first, D will copy the natural gender and number of the pronoun, together with the person feature, thereby collecting a full set of ϕ-features [γ:F/M,anim, #:sg, π:Participant].

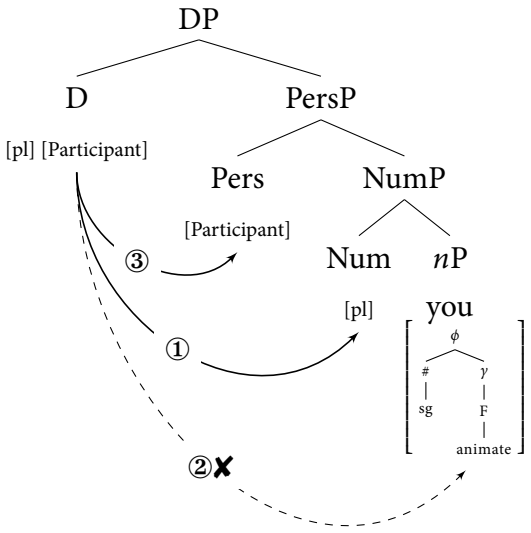
(224) Gender Agree (+ number valuation) ① > Person Agree ②:



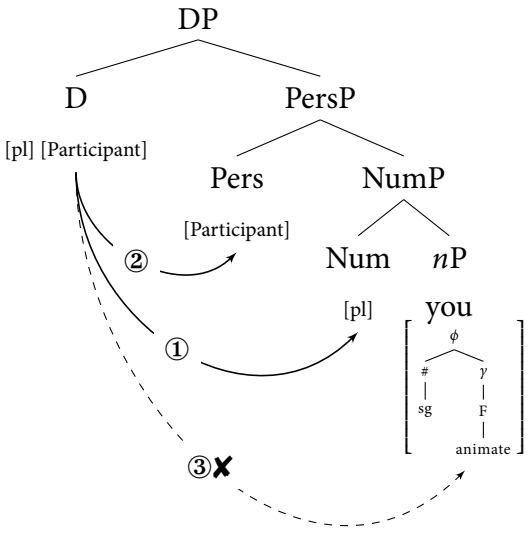
Furthermore, if Number Agree precedes all the other operations, the features that D would copy include the formal plural number and the person feature, as indicated in (223). The reason for this is that the number probe will locate the first goal on the NumP, which would trigger a CAD effect whereby any attempt to reach the *n*P and value gender features from it will fail. Thus, Gender Agree will not succeed in any of the combinations in (223c)-(223d), as illustrated in (225) and (226). However, since Person Agree follows Number Agree, and the head hosting this feature is above the NumP, the person probe will always be able to reach its features on the PersP (225)-(226). The result is the formal plural number and the second person value on the DP [γ:∅, #:pl, π:Participant].[79]

[79] Since the underlying assumption is that D is not overtly realised, the default value of gender will never be realised on D either.

(225) Number Agree ① > Gender Agree ② > Person Agree ③:

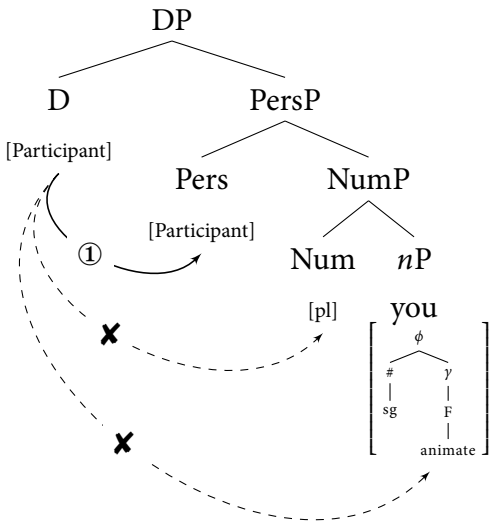


(226) Number Agree ① > Person Agree ② > Gender Agree ③:



Finally, as seen in (223e)-(223f), ordering Person Agree before the rest of the operations yields an interesting result. The first operation will find the closest matching feature very close in the structure, on the highest of the ϕ-feature-hosting functional projections, the PersP. Upon this step, the CAD will prohibit other operations from searching into the c-command domain of the PersP. The other two operations will thus fail to copy their features and the result will be a D that only has the value for person: [γ:∅, #:∅, π:Participant]. The consequence of the final two orderings is then that D actually does not inherit number or gender.[80]

(227) Person Agree ① > {Gender Agree, Number Agree }:



[80] In principle, this predicts that there should be a language such that it shows full person agreement and default gender and number (or no gender and number marking) on articles, determiners etc. Yet, since pronouns are rarely preceded by determiners, empirical data that would test this abstract prediction would require a more extensive search. I leave this issue open for future research.

For any external probe, for instance the participle, no values for number and gender on D would not mean that those values are not available at all. Gender and number features are still available in their base positions, NumP and *n*P, which is how far the probes will need to search in order to find them. Therefore, failure to project number and/or gender on D does not mean these features are not available to future probes. It only means that for the current probe on D they will not be able to provide a value.

What all the possible orderings above have in common is that the values for person features will always arrive to D. We will see below that this fact will play a role in agreement on finite verbs, but it will be largely irrelevant for all the other predicates that only look for number and gender features. As for agreement with 3rd person pronouns and nouns in general, since they do not contain the PersP, Person Agree will always fail to apply. Thus, no domain will be created for the CAD to apply, hence Person Agree will simply not have any influence on agreement.[81]

6.3 Agreement on finite verbs

What is uniform about all the languages in which Predicate Hierarchy effects were recorded in the literature so far (the summary of which is repeated in (228)) is that finite verbs in all of them agree for formal features. In agreement with the honorific pronoun, this formal feature is the plural number of the pronoun.

[81] The failure of person agreement will not be recorded by the morphology on agreement targets that do not express person features (participles, adjectives, etc.), but in finite verbs, it will always motivate the insertion of the default 3rd person morphology.

Group 1	finite verb ||	participle	adjective	noun
French	PL	SG	SG	SG
Romanian	PL	SG/(PL?)	SG	SG
Italian dialects	PL	SG	SG	SG
Modern Greek	PL	SG	SG	SG
Czech	PL	SG	SG	SG
Group 1a	**finite verb**	**participle**	**adjective ||**	**noun**
?	PL	PL	PL	SG
Group 2	**finite verb**	**participle ||**	**adjective**	**noun**
Ukrainian	PL	PL	SG	SG
Belorussian	PL	PL	SG	SG
Russian	PL	PL	short form PL 97%	SG
			long form SG 89%	SG
Slovak	PL	PL	SG	SG
Group 3	**finite verb**	**participle**	**adjective**	**|| noun**
Icelandic	PL	n.a.	PL / SG	n.a.
Lower Sorbian	PL	PL	PL / SG	SG
Macedonian	PL	PL	(PL) / SG	SG
Bulgarian	PL	PL / SG	SG	SG
Upper Sorbian	PL	(PL) / SG	(PL) / SG	SG
Polish dialects	PL	PL / SG	PL / SG	SG
BCS	PL	PL / (SG)	PL / (SG)	SG
Slovenian	PL	PL / (SG)	PL / (SG)	SG

Table 6.3: Predicate Hierarchy effects

Therefore, regardless of which of the languages above we examine (e.g. French (228a), Czech (228b) or BCS (228c)), what we will find is that the finite verbs show formal 2nd person plural agreement.

(228) a. Vy **jste** byla dobrá.
you aux.2.PL been.F.SG good.F.SG
'You (female referent) were good.' [Czech] (Comrie 1975:408)

b. Vous **êtes** loyal.
you aux.2.PL loyal.M.SG
'You (male referent) are loyal.' [French] (Comrie 1975:409)

c. Vi **ste** pažljivi.
you.2.PL aux.2.PL attentive.M.PL
'You (male or female referent) are attentive.' [BCS]

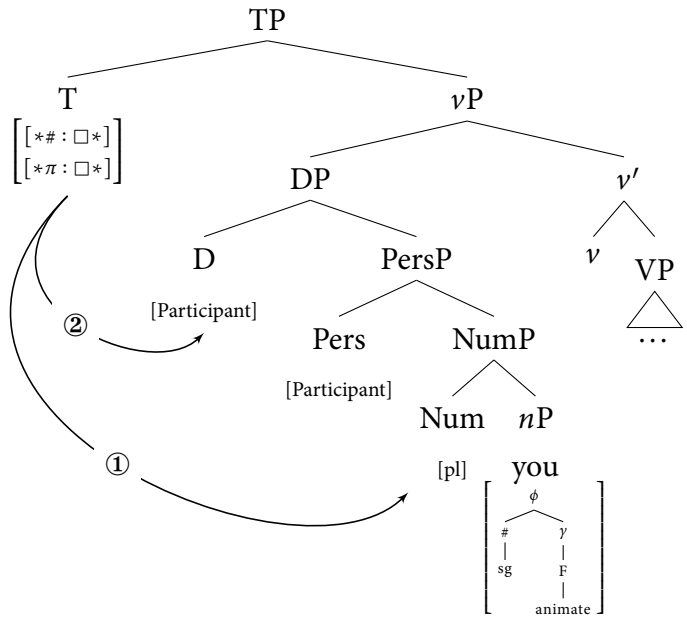
A very simple and intuitive way to capture this observation, even without assuming the system of agreement we have been developing, would be to simply treat this formal agreement as an instance of agreement between the finite T and the formal number and person features of the subject pronoun. All these languages belong to the Indo-European family, where finite

verbs only show person and number, but no gender agreement. As such, it is safe to assume that these predicates do not have a gender probe at all, but rather probe only for person and number (departing from the standard generative practice, cf. Chomsky 2000, 2001).

Following Anagnostopoulou (2003); Béjar (2003); Béjar and Řezáč (2009); Laka (1993); Preminger (2014); Sigurðsson (1996), among many others, I assume that agreement in person and number is established by means of two separate Agree operations. I assume that the probes for person and number are located on the finite T head in the languages under discussion. Assuming that the honorific pronoun is the agreement controller for T, the person features that the person probe needs to find are located on the PersP, following the assumptions from Section 6.1.1. The potential goals for the number probe can be found on two different projections – the NumP, which carries the formal plural number of the pronoun and the *n*P, which encodes the natural, or real-life number of the referent (singular). In this configuration, the formal [#:pl] features will always be the closer goal for T. Nevertheless, it necessary to take into account any features that D may have projected after carrying out agreement with its internal phrases. In the remainder of this section, we will inspect the three scenarios.

When Person Agree precedes the other two operations on D, valuation by the [π:Participant] feature obtains on this head, since the subsequent two Agree operations fail due to the CAD, as illustrated in (227). Assuming the order where Number Agree is given precedence on T, the unvalued features of the number probe will always be valued by the closest-matching goal, i.e. the NumP. The person probe will copy the closer matching [π:Participant] feature from D, as illustrated in (229).

(229) Agreement on finite verbs with D[π:Participant]

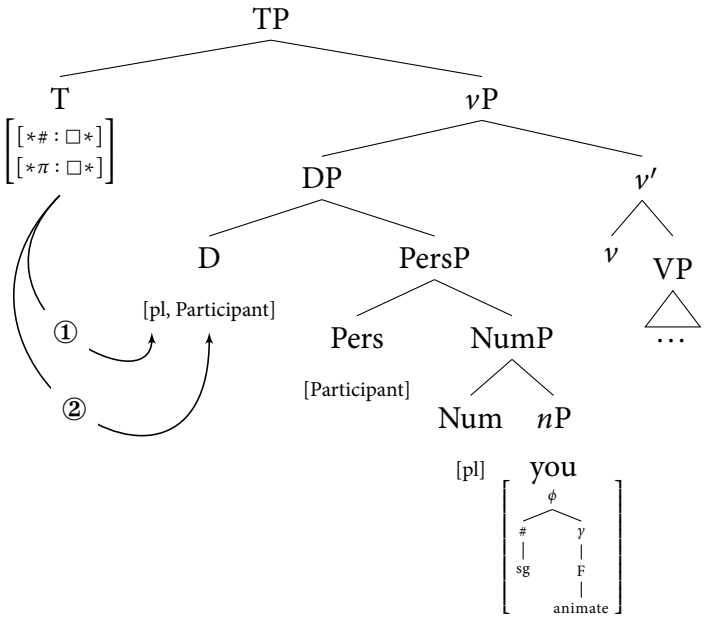


The derivation above analyses the situation in which probing for number is ordered prior to probing for person. If the order of operations were different on T, the Condition on Agree

Domains would instruct Number Agree not to probe beyond D, which would be targeted by the first, Person Agree operation. This would lead to a failure of number agreement, and the insertion of the default singular exponent. Since a situation like this never arises in agreement with the honorific pronoun, I tentatively propose that the order of operations on finite T is actually fixed, such that Number Agree always precedes Person Agree.[82] [83]

In the configuration where Number Agree has probed for its features first on D, which leads to failure of gender agreement, the features that D projects are the formal plural number and second person, as shown in (225)-(226) above. If T agrees with such a DP, agreement in formal plural number and second person is derived straightforwardly. All the features that T searches for are found on D and copied from there, in accordance with the locality constraints on Agree:

(230) Agreement on finite verbs with D[#:pl, π:Participant]



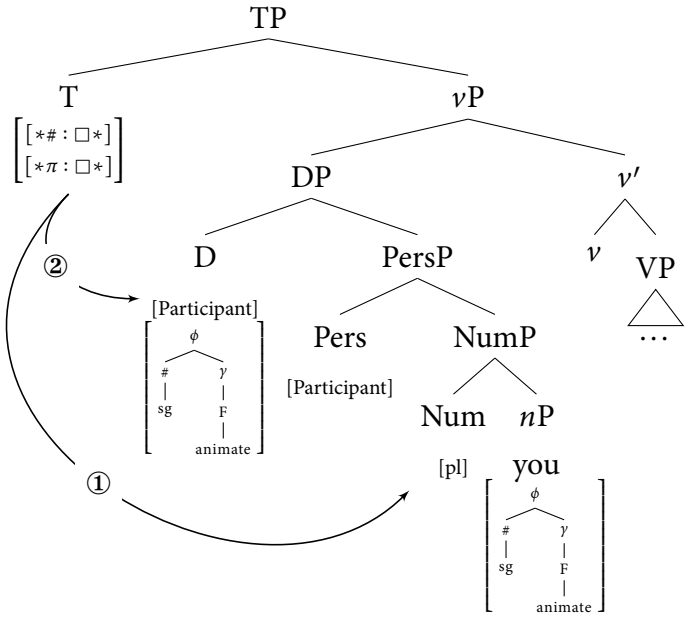
Finally, in the configuration where, after Gender Agree has probed first on the DP and the natural gender, singular number and second person are copied by D as in (224) above, T will still nevertheless copy only the formal person and number features. A potential complication that arises in this particular derivation comes from the fact that D contains a singular number feature, which Number Agree on T could theoretically copy. However, empirically, this does not seem to be the case, as T always seems to target the formal plural number. Therefore, it

[82] Of all the works cited above that advocate the separation of person and number probing, to my knowledge, only Béjar and Řezáč (2009); Preminger (2014); Deal (2015) explicitly discuss the ordering between the two probes. While in the work of Béjar and Řezáč (2009), person and number probes are assumed to be located on the same head, from which the person probe is discharged before the number probe, Preminger (2014:55) assumes that the two probes are located on two separate heads, where the person-probing head is merged before the number-probing one. These accounts do not talk a lot about the possible parametrisation, nor do they require that this ordering holds cross-linguistically. Therefore, I depart from their proposals in assuming a different order of Agree operations for the Indo-European languages under discussion here.

[83] This assumption will not have any repercussions for agreement with other regular pronouns.

seems like the number probe on T skips the singular feature on D, in order to find the plural value on the NumP, as in (231). The person probe would halt at D, where its designated feature is found.

(231) Agreement on finite verbs with D[γ:F,anim, #:pl, π:Participant]



I see two potential explanations for why T should skip the singular number on D. The first one concerns the conditions on valuation, namely the fact that copying of natural number has always come as a sub-product of copying natural gender. Since T does not have a gender probe, valuation by natural number can never occur. On the other hand, it might be assumed that the valuation possibilities are reciprocal and that copying of semantic singular number might also pied-pipe the natural gender. While this is a logically possible option, it does not seem to be applicable to T. In the situations where the gender probe was searching for its features, pied piping number values back to the functional head was tolerated since that head was searching for number as well. However, the reverse situation does not seem to hold with T. If T were to copy the semantic singular number, this number would then have to pied-pipe the gender features as well, which do not fit its specification. Therefore, such a derivation would crash due to the incompatibility of the features that T receives with the ones that it actually searches for.

Another possible reason why T cannot be valued with the semantic singular number is that the finite T probe may be relativized for plural number. This observation has already been made in the Slavic literature in agreement in copular sentences. For instance, Veselovská (2008:566) notes that in Czech, out of two nouns in a predication relation, the one with the more marked number feature (plural) controls the agreement on the copula, as illustrated by (232). The same observation can be carried over to BCS (233).

(232) a. Ty knihy jsou / *je vylovzený brak.
the books.PL are / is a.real trash.SG
'The books are real trash.'

b. Čas jsou / *je peníze.
time.SG are / is money.PL
'Time is money.' [Czech] (Veselovská 2008:566)

(233) a. Te knjige su / *je užas.
the books.PL are / is terror.SG
'The books are terrible.'

b. Poklon su / *je igračke.
present.SG are / is toys.PL
'The present is the toys.'

Assuming that the copular verb enters into an Agree relation with both of its arguments, the examples above show that the argument that determines its agreement is the one whose number feature is more marked, i.e. plural. This provides some grounds for the assumption that the number probe in these languages may be relativized for the more marked plural number feature. The probe would then be urged to skip the singular value on D and search for the exact match, which it would find on Num.

As for the interaction of T with other predicates, we will see in the following sections that there is reason to believe that T and the Participle probe independently for different ϕ-features, i.e. while T probes for number and person, the Part(iciple) probes for gender and number. This will explain why the features they show do not necessarily have to match.

6.4 Agreement on participles

The main task of this section is to show how the two types of agreement patterns on participles, i.e. the natural gender and number agreement or the grammatical number and default masculine gender agreement, are derived. How these patterns then become restricted to particular languages, or available in a single language, will be the topic of the following subsection.

In order to derive the desired patterns, it is instructive to point out one conclusion of Despić (2017): the agreement target that is capable of showing mixed agreement must agree either in fully formal or fully semantic features of the hybrid controller, such as the honorific pronoun. There is never a situation where the participle agrees with the honorific pronoun such that its features are valued with grammatical number of the pronoun (plural) and the natural gender of the referent (feminine/masculine). The participle will either copy a full set of formal features (plural number and 'failed' default gender) (234a) or a full set of semantic features (feminine singular) (234b). If this pronoun triggers feminine plural agreement, as in (234c), the sentence can only mean that there were multiple (semantic plural number) female persons (semantic feminine gender) who travelled. However, the same sentence can never have the reading in

(234d), where it would refer to a single female person (where the suffix *-e* would actually express the formal plural number and semantic feminine gender).

(234) a. Vi ste putoval-i.
you.2.pl aux.2.pl travelled-m.pl
'You (single female addressee) travelled.'

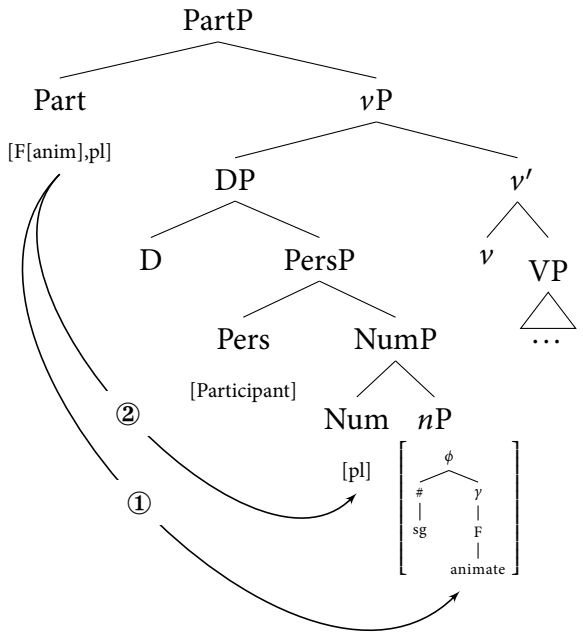
b. %Vi ste putoval-a.
you.2.pl aux.2.pl travelled-f.sg
'You (single female addressee) travelled.'

c. Vi ste putoval-e.
you.2.pl aux.2.pl travelled-f.pl
'You (multiple female addressees) travelled.'

d. Vi ste putoval-e.
you.2.pl aux.2.pl travelled-f.pl
*'You (one formal addressee) travelled.'

In terms of the system developed so far, this means that we should never have the situation where the participle would copy the natural gender (but not natural number) from *n*, and grammatical number from Num, as in (235). It seems that, since natural gender and number are connected in a hierarchical entailment relationship, copying one without the other does not occur.

(235) Incorrect derivation, no copying of natural number:



Therefore, what must be ensured is that natural singular number is copied together with the natural gender. In my system, this restriction must be the result of the entailment relation between the features in the hierarchy. The obligatoriness of copying of the entire feature snippet was regulated by the Condition on Full Valuation in (37) above, repeated in (236).

(236) *Condition on Full Valuation*: Valuation is successful if and only if

a. the goal entails the features of the probe;

b. the full set of the goal's features is copied by the probe.

As mentioned before, this condition can be thought of as a version of Chomsky's (2001:15) *Maximise Matching Effects* or Pesetsky's (1989) *Earliness Principle*, the idea behind which is that, if the probe and the goal match, agreement has to apply as soon as possible, as efficiently as possible. More importantly, according to Chomsky (2001:15) 'partial elimination of features under Match, followed by elimination of the residue under more remote Match, is not an option'. Recast in terms of the system as it is set up here, this means that partial valuation after matching only a subset of features, followed by valuation of another goal with the residue features, is not possible.

Applied to the current system, if natural number is present on an *n*P in the geometry together with natural gender, and the probe needs to copy only gender features, I assume it cannot do so without copying all the features that make up the snippet of the feature geometry (cf. Preminger 2014:47). Put differently, if the gender probe [$*\gamma$:□[anim:□]$*$], has reached the *n*P and matched the gender and animacy features present on it, by copying these features, it 'pulls together' the rest of the features present in the geometry, as an inseparable part of it.[84] This way, copying ϕ-features indeed means copying the entire snippet, regardless of the fact that some of the features were not a part of the specification of the probe. Similar ideas were advocated by Béjar (2003); Béjar and Řezáč (2009); Preminger (2014); Deal (2015), in inspecting the interactions of person and number features. As a consequence, this approach rules out partial valuation in two directions. First, a complex articulated probe, such as [$*\gamma$:□[anim:□]$*$], cannot enter an Agree relation with a head that has only a subset of its features, e.g. a Gen head which only has a gender feature. It will skip such goals in search for a full match and only then will valuation be allowed. Conversely, if a goal is supposed to value a probe, it cannot value this probe with only a subset of its own features. It must contribute *all* of the features it has.

In a concrete derivation of the natural gender and number agreement pattern, these assumptions work together as follows. Recall that in languages such as Czech and French, the participle agrees in singular number and referent-dependent gender, repeated in (237). These languages will therefore be taken to instantiate the semantic agreement pattern.

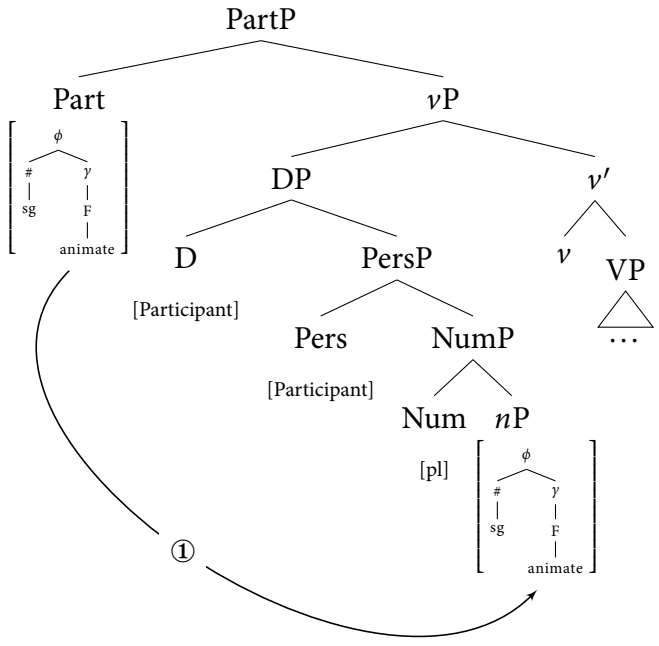
(237) a. Vy jste **byl-a** dobrá.
you aux.2.pl been-f.sg good.f.sg
'You (female referent) were good.' [Czech] (Comrie 1975:408)

[84] See also Preminger (2014:57) for a similar proposal employed in order to account for clitic doubling in Agent Focus constructions in Kichean. According to him, in clitic doubling constructions in this language, the person probe, even though it searches only for person features, must copy the entire geometry of ϕ-features it finds, which includes number values as well.

b. Vous êtes **venu**.
you aux.2.pl come.m.sg
'You (male referent) have come.' [French] (Comrie 1975:409)

Under my current assumptions, it must be the case that in the examples above the participle must copy the natural gender and number either from the *n*P or from D, depending on the features that D is valued with. For the purposes of a general demonstration, I will first take it that D has only copied the feature [π:Participant], as in (227) above. This implies that the natural gender and number feature, as well as the formal number are still available in their base positions. Semantic agreement pattern on the participle will then result from the ordering of operations in which Gender Agree precedes Number Agree. The gender probe reaches down to *n*P, where it finds the matching gender and animacy features. Since these features are embedded within a geometry that also contains singular number, this number feature is pied-piped with gender, as the whole feature snippet is copied. As a result, the number value is carried together with the gender features as a "free rider" on the gender probe. Consequently, the number probe need not be discharged to look for its designated features, since the features that it needs have arrived to the probing head during the first Agree operation. The participle is thus valued with the natural gender and number of the honorific pronoun. The process is schematised in (238).

(238) Natural gender and number: [$*\gamma$:□[anim:□]$*$] > [$*$#:□$*$]



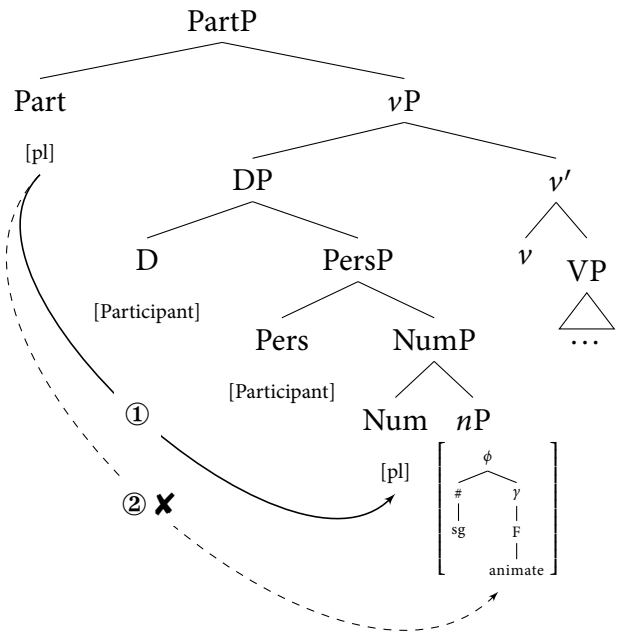
The pattern of grammatical plural number agreement, which obtains in BCS and other uniform agreement languages, is the result of the opposite order of operations, where Number Agree precedes Gender Agree. Recall that when this pattern arises, the Participle's features are valued by the grammatical plural number of the pronoun and the default masculine gender, as in Slovak and BCS below.

(239) a. Mama, čo ste **robil-i**?
father what aux.2.PL done-M.PL
'Mother, what have you done?' [Slovak] (Corbett 1983:44)

b. Gospođo, šta ste **uradil-i**?
lady what aux.2.PL done-M.PL
'Lady, what have you done?' [BCS]

The default masculine gender agreement in (239) means that gender agreement has failed (cf. Despić 2017). This is true if Gender Agree has not managed to reach the gender features located on the *n*P, due to an intervention effect. As before, what is responsible for this intervention effect is the Condition on Agree Domains (CAD), triggered by Number Agree. After Number Agree has been initiated, the first goal that this operation finds is the NumP. The probe will copy the [#:pl] feature from this phrase, establishing at the same time a domain for the following Agree operation. In this situation, Gender Agree cannot reach the *n*P any more, which leads to a failure of gender agreement. This results in the default valuation of the gender features by the morphology. The derivation is presented in (240).

(240) Grammatical number and default gender: [∗#:□∗] > [∗γ:□[anim:□]∗]

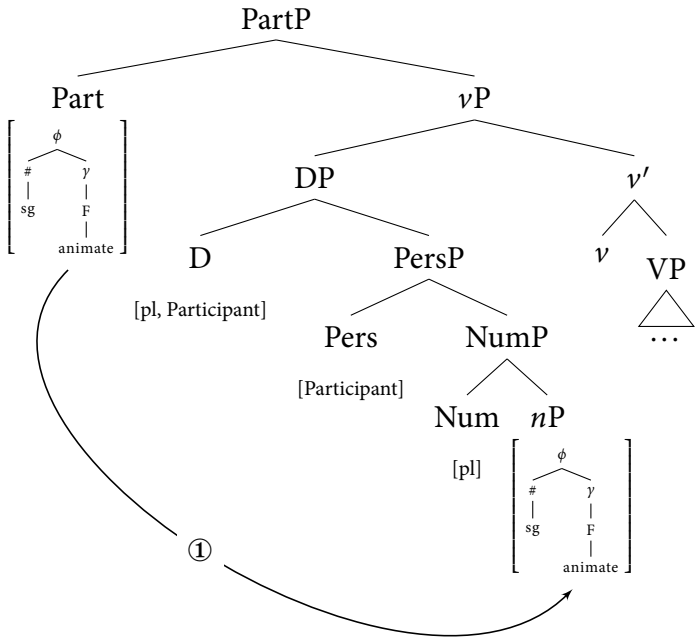


In sum, the analytical options presented in (238) and (240) derive the possible patterns for participial agreement, together with the observations from previous literature, under the assumptions which are needed independently in order to capture mixed agreement patterns.

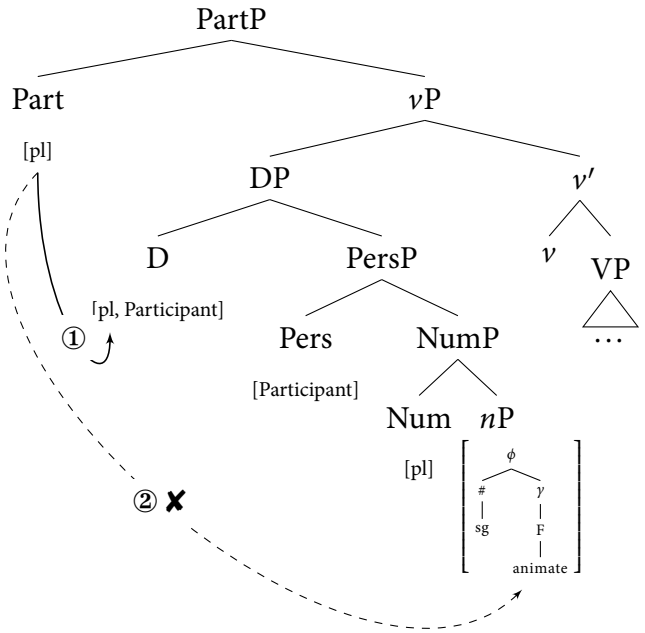
Two other combinatorial possibilities remain in respect of the results of agreement on D. If Number Agree applied early on D, the formal [#:pl] number and the [π:Participant] person feature values are present on the D head (as in (225)-(226) above). The results of agreement on the Participle will be the same as the ones examined in (238) and (240) above, due to the very

low position of natural gender and number, and a high position of the formal plural number. The only difference would come from the position of the number feature on D. Under the order where gender is valued first, as in (241), the matching feature is found on *n*, and its copying involves a free-ride of the number value to the Part. Under the reverse order, since the plural number feature is present on D, and thus closer to Part than the one on the Num head, D's plural feature will saturate Part's probe, and disable the gender probe to reach the *n* head (242). The default masculine gender value will be provided by the morphology.

(241) Natural gender and number: [∗γ:□[anim:□]∗] > [∗#:□∗]

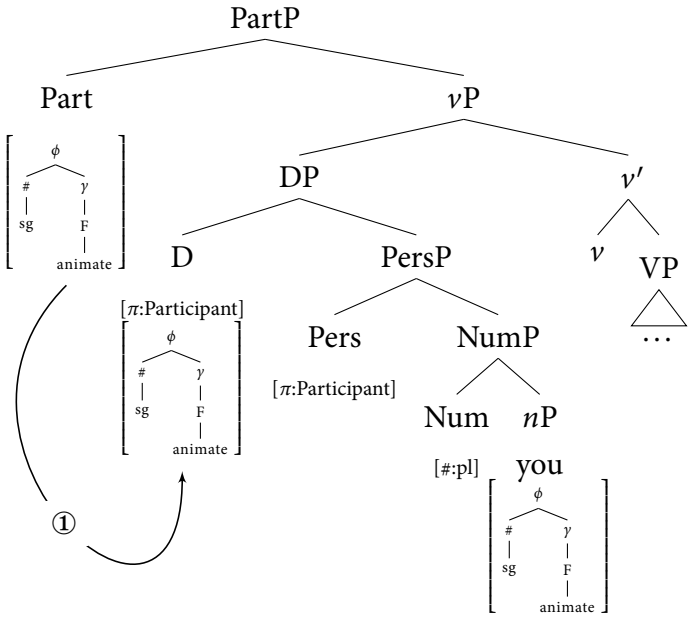


(242) Grammatical number and default gender: [∗#:□∗] > [∗γ:□[anim:□]∗]



The final logical possibility involves a D that has copied a full set of ϕ-features, namely the semantic gender and number as well as person. With this kind of D, the Part will have no need to 'look inside', as all the possible values it may need are available on D's surface. Considering the fact that D can only offer the natural gender and number, those are the features that Part will always copy, under any order of operations. If Gender Agree is carried out first, the singular number value will be pied-piped to Part. The reverse holds if Number Agree is given precedence. Unlike with agreement on T in (231) above, if participle's Number Agree finds the singular value in the feature inventory of D, it will actually be able to copy this feature, and pied-pipe the gender value. The reason for this would be that this gender value would not be incompatible with the feature specification of Part, since it would actually be able to automatically saturate the Part's gender probe (cf. the Condition on Full Valuation (37)).

(243) Natural gender and number with D[γ:F,anim, #:pl, π:Participant]



All the possible options for participial agreement with the honorific pronoun are summarised in the Table 6.4. As the table illustrates, any combination of features on D will yield an attested pattern of agreement on the participle. In the following section, we will briefly discuss the consequences of these results and their implications for language variation.

	Gender Agree > Number Agree	Number Agree > Gender Agree
D[γ:∅, #:∅, π:Participant]	[γ:F/M, animate, #:sg]	[γ:∅, #:pl]
D[γ:∅, #:pl, π:Participant]	[γ:F/M, animate, #:sg]	[γ:∅, #:pl]
D[γ:F/M, #:sg, π:Participant]	[γ:F/M, animate, #:sg]	[γ:F/M, animate, #:sg]

Table 6.4: Possibilities for agreement on Part

6.4.1 Deriving the variation in agreement with participles

Having seen how the two patterns come about, the question that remains to be answered is how to ensure that the natural gender + natural number pattern always obtains in languages such as Czech and French, while some languages, such as BCS, can allow for variation between the two patterns, and finally, why some languages only ever allow for grammatical number agreement on their participles.

One possibility to restrict the patterns is to assume that in languages that only show semantic agreement, the order of Agree operations is fixed such that Gender Agree always precedes Number Agree. From our sample in Table 5.1 and 6.3, in languages such as French, Italian (dialects), Modern Greek and Czech, all of which are characterised by natural gender and number agreement on the participle, the order of Agree operations should always be such that Gender Agree precedes Number Agree.[85] It seems like this is all we have to say for these languages, since the order of operations on D does not seem to play an important role. With any order of operations on D, their participles will always agree in semantic gender if Gender Agree is granted precedence.

Languages in which optionality in the features of the participle obtains should arguably have both orders of operations at their disposal. These languages include Bulgarian, Upper Sorbian, Polish (dialects), Slovenian. The preferences towards one or the other type of agreement noted in the table and in the surveys may come from either usage preferences or pragmatic constraints, or a combination of the two. BCS (especially the western Croatian dialects) probably falls into the category as well. We might assume that in those dialects where natural gender and number agreement are unacceptable, the order of operations is fixed, or rather, has become fixed as a result of some grammaticalisation process. Dialects such as those in (western) Croatia, in which natural gender and number agreement are allowed, can be treated as those allowing for both orders of Agree operations.

Finally, languages in which the participle only shows grammatical number agreement, such as Slovak, arguably give preference to Number Agree with respect to Gender Agree. What is interesting from Table 6.4 is that in order to uniformly get formal agreement on the participle, Gender Agree has to apply late both on D and on Part. Thus it seems that these languages somehow give preference to formal feature valuation by postponing the valuation of gender features, whose failure seems to be much more easily tolerated than in languages such as French and Czech. Lower Sorbian, Macedonian, Bulgarian, Ukrainian, Belorussian and Russian[86] would fall into this category.

[85] Note that Czech has been placed into this group following Comrie (1975:408), even though its participles do allow for grammatical number agreement as well. The reason for classifying it as a language with a strict order of operations might be the relative frequency of semantic agreement, which in this language is much higher than with grammatical number agreement.

[86] For Russian, the preference for number agreement as a first operation might also be tied to the fact that this language neutralizes gender distinctions in the plural. The lack of gender distinctions in the plural could indicate to the learner that obtaining number information is somehow more important than obtaining gender information.

To sum up, the languages from Table 5.1 can be re-classified in the way represented below.

Gender Agree > Number Agree	both orders	Number Agree > Gender Agree
French, Italian (dialects), Modern Greek, Czech	Romanian (?), Slovak, Upper Sorbian, Polish (dialects), Slovenian, BCS	Slovak, Ukrainian, Lower Sorbian, Bulgarian, Macedonian, Belorussian, Russian

Table 6.5: Variation in the orders of Agree on Part

6.5 Agreement on predicate adjectives

In the summary of Predicate Hierarchy effects in Table 5.1 and Table 6.3, it is evident that most languages do not seem to be too restrictive when it comes to semantic agreement on predicate adjectives, as only a small number of them completely rule it out. The only languages from the sample that seem to completely resist semantic agreement on the predicate adjective are Slovak and Russian (only on its short-form adjectives). In order to develop a general account of agreement with predicate adjectives, I will first put Russian to the side throughout this section, and return to it in the appendix, to show that formal agreement on short-form adjectives is an exception, rather than a rule. As for all other languages, if they do not happen to prefer it, they at least allow singular and natural gender agreement. Exactly this situation is in accordance with the Distance Principle, as depicted by Corbett's observation: 'as we move rightwards along the Predicate Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically' (Corbett 1983:43f.). Indeed, after comparing them to participles, predicate adjectives agree in semantic features more readily. In the following discussion, I will not focus on the frequency effects as much as on the syntactic causes of the variation between semantic and formal agreement patterns.

The variation in question concerns the differences between languages that uniformly (or at least overwhelmingly) show only one or the other type of agreement. As representatives of languages with semantic agreement, let us take Czech and French. The predicate adjective in such languages agrees in the natural number and in the natural gender of the referent. In agreement with the honorific pronoun that refers to a single person, as in (244), this natural number is singular, while gender is feminine in (244a) and masculine in (244b).

(244) a. Vy jste byla **dobrá**.
you aux.2.pl been.f.sg good.f.sg
'You (female referent) were good.' [Czech] (Comrie 1975:408)

b. Vous êtes **loyal**.
you aux.2.pl loyal.m.sg
'You (male referent) are loyal.' [French] (Comrie 1975:409)

What we do not seem to find is a language Czech', which would allow only exclusively grammatical agreement on the predicate adjective. I leave it to further research to verify whether this is a systematic, or an accidental gap.
Other languages allow for optionality, which is nicely exemplified by Macedonian below.

(245) a. Vie ste pametna / ubava.
you.2.PL aux.2.PL smart.F.SG / beautiful.F.SG
'You (feminine addressee) are smart / beautiful.'

b. Vie ste pametni / ubavi.
you.2.PL aux.2.PL smart.PL / beautiful.PL
'You (feminine addressee) are smart / beautiful.' [Macedonian]

Among such languages is BCS. Recall that in most of the standard varieties, plural number and default masculine gender are the most commonly instantiated type of agreement:

(246) Vi ste bili **pospani**.
you.2.PL were.2.PL been.M.PL sleepy.M.PL
'You (feminine or masculine addressee) were sleepy.'

However, we have seen in Section 5.1 that singular and natural gender agreement is marginally allowed in some dialects and varieties of BCS, as illustrated in (247). Such evidence makes it necessary to explain how variation within one language comes about.

(247) Vi ste **lepa**, **pametna** i **uspešna** – zašto vas muškarci
you.2.PL aux.2.PL beautiful.F.SG smart.F.SG and successful.F.SG why you men
ne vole?[87]
not love
'You (female addressee) are beautiful, smart and successful – why do men not like you?'

Other languages of this type include Icelandic, and Lower Sorbian, while in Ukrainian and upper Sorbian singular is the preferred pattern, unlike in Macedonian, Slovenian and BCS, where both forms are attested, but the plural is more frequent.
In the remainder of this part, I will develop an extension of the current proposal in order to explain and derive the agreement patterns with predicate adjectives. We will see that the patterns fall out from (i) the result of the operations proposed at the DP level, (ii) the configuration in which the subject honorific pronoun and the predicate adjective are found, and (iii) the order of operations on both the DP and the A(djective) P(hrase).

6.5.1 Agreement on predicate adjectives: Analysis

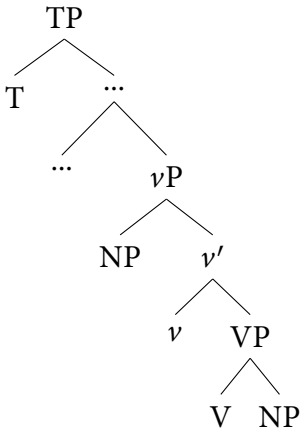
The proposal I will lay out in this section is that agreement on predicate adjectives is derived via upward Agree, in the sense of Baker (2008, 2011). Furthermore, agreement on the predicate

[87] https://www.trafika.online/proizvod/23411/placebo-ste-vi-snaga-vaseg-uma, accessed 12.04.2017

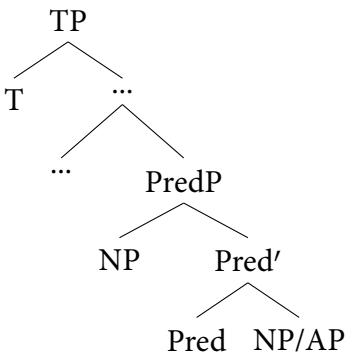
adjective will be shown to directly depend on the result of DP-internal agreement, i.e. what features are projected by D. The details of this process will be the main concern of this section, while the proposal will be extended in Section 6.5.3 to suggest that an additional possible configuration, in which the adjective can also probe in a downward fashion.

As for their structural position, following Baker (2003:31) (see also Bowers 1993; Bailyn 1994, 2012), I assume that predicate adjectives are introduced as complements to Pred(ication) P(hrase). According to Baker (2003:31), a projection like this is necessary for adjectives and nouns to be able to introduce an external argument (as opposed to verbs, which are predicates in the narrow sense and only they can license a specifier which they can theta-mark). Thus, according to Baker (2003) (building on Bowers 1993), lexical verbs as predicates have the structure as in (248), with a verbalising head V and the causative *v* on top of it, while the structure of predication which includes a noun or an adjective phrase is given in (249). The difference between *v* and Pred is in that Pred carries no lexical meaning and is a purely functional category that introduces the external argument of a noun or an adjective, which are not capable of introducing one themselves. In contrast, *v* can also be a lexical head. Additionally, Pred does not carry out any agreement operations.[88]

(248) lexical verbs (Baker 2003:37)[89]



(249) predicate adjectives / nouns



Regarding the adjectival phrase, following Baker (2008), I assume that predicate adjectives contain a functional projection, F_AP, above the AP, which is responsible for carrying out agreement.[90] The conjunction of the two assumptions yields the following structure of adjectival

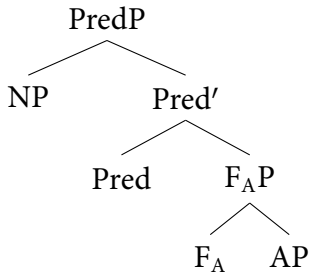
[88] In fact, Baker (2003:83) equates V with Pred, but I abstract away from this distinction for the purposes of developing a general account. See Section 6.8, which offers an account of Russian long- and short-form adjectives, where this distinction proves crucial for deriving their agreement patterns.

[89] Baker (2003) in fact argues that the theme argument in this structure is the specifier of V(P), and this is the position where the Theme theta-role is assigned according to the Uniformity of Theta-assignment Hypothesis (UTAH) (Baker 1988). Yet, for the purpose of the general discussion, I treat it as a complement, since this distinction is in no way crucial for the proposal.

[90] As mentioned in footnote 31 in Section 3.1.1, such a projection should also exist on attributive adjectives. Different authors also refer to it as Mod(ification) P(hrase) which is deemed responsible for some of the semantic properties of attributive adjectives (see Rubin 1994), as well as for the additional morphology of Russian long-

predication:

(250) predicate adjectives (Baker 2008:45)



In this configuration, the subject noun, which is the goal for the adjectival probe, is located above the adjective, i.e. the goal c-commands the probe. In order to explain how agreement can still obtain between the two, Baker (2008) proposes a revision the c-command condition on Agree[91] as in (251).

(251) *The c-command condition on Agree* (Baker 2008:45):
F agrees with XP, XP a maximal projection, only if:
F c-commands XP *or XP c-commands F.*

The NP in Spec-PredP c-commands the agreeing head F_A, which satisfies (251), allowing for agreement to obtain between the two.[92]

With these assumptions as background, I propose that the predicate adjective agrees with the noun in the specifier of PredP via Upward Agree, under c-command. An immediate consequence of the proposal is that the only possible target for the adjective is the DP layer of the subject nominal phrase. Therefore, the predicate adjective can only agree with whatever the DP has projected, as a result of its internal Agree operations.[93] In other words, the adjective

form adjectives (see Bailyn 1994 for further detail). Baker avoids this comparison, claiming that F_AP is only in charge of conducting agreement and the morphological realisation of the adjective's ϕ-features.

[91] The c-command condition is the condition in (ib) from the definition of Agree formulated by Baker (2008), based on Chomsky (2000, 2001), which we have already encountered in Part 2, Section 3.1.4:

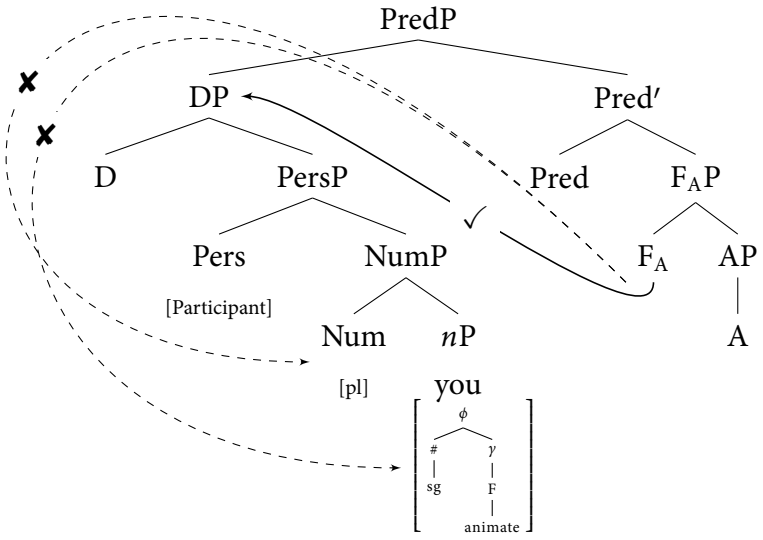
(i) F agrees with XP, XP a maximal projection, only if:
  a. F c-commands XP or XP c-commands F (the c-command condition).
  b. There is no YP such that YP comes between XP and F and YP has ϕ-features (the intervention condition).
  c. F and XP are contained in all the same phases (the phase condition).
  d. XP is made active for agreement by having an unchecked case feature. (Baker 2008:65)

[92] In fact, Baker argues that downward agreement on adjectives is also possible (as with nominal modifiers and a particular kind of predicate adjectives, to which we return below). The underlying assumption I make here is that the adjective first probes down in its c-command domain. If it does not find a goal there, it is still allowed to search upward and agree with a matching c-commanding goal.

[93] As Agree has been assumed to target heads instead of phrases throughout my analysis, I continue assuming that the adjective actually agrees with D. In order to allow that, we must assume that the head of the phrase and its maximal projection are equidistant, and everything that is c-commanded by D is also c-commanded by the

can not 'look inside' the DP, i.e. below D. Thus, it cannot establish an Agree relation with the NumP or the *n*P due to the lack of c-command between the F_A probe and these two potential goals. In the concrete case of agreement with the honorific pronoun, this means that the F_A cannot reach the grammatical plural number on the NumP, or the natural gender and number on *n*P as in (252).

(252) Agreement of predicate adjectives with subject DP



As a result, the features of the predicate adjective should always be valued by the features that D has acquired after carrying out its Agree operations.

6.5.2 Deriving the basic patterns

With the assumptions on the predication structure and the process of Agree on predicate adjectives from the previous part, we can now turn to the derivations of the two basic patterns of agreement. As will become apparent shortly, the agreement patterns will be highly dependent on the result of the operations that applied at the DP level.

The mechanics of the DP-internal agreement proposed in previous chapters has enabled projecting either natural gender (and number) or grammatical gender and number (as well as person) features on the DP level, as its end result. This was achieved by letting D perform Gender Agree, Number Agree and Person Agree operations in any order. A DP whose D has one of the three possible feature specifications can appear in the Spec-PredP position and act as a goal for the Agree operation carried out by the adjective, or more specifically, by the F_A-head. I assume that this probe, like all other adjectival probes, can carry out Gender Agree and Number Agree operations in two different orders. However, the order of operations will

DP (see Schoorlemmer 2009 for some discussion). This would allow the F_AP to reach the feature values on D.

not be relevant in this configuration, as there is only one possible goal that the F_A-head can copy features from, namely the D layer of the subject honorific pronoun. Thus, under any order of operations, the predicate adjective will simply match and copy the features that D has to offer.

Consequently, if D has collected the semantic features of the honorific pronoun, i.e. the natural gender and number (and the 2nd person), these will be the features that the F_A-head will copy under any order of operations.[94] Precisely this situation will yield patterns such as those in French, Czech, etc., repeated in (253), where natural gender and number agreement is the only option. If Gender Agree applies first, it will match the gender and animacy features of the DP, but it will copy the whole snippet together, rendering number agreement unnecessary as the number value will arrive to D. The same will happen if Number Agree probes first – copying the singular number feature entails copying all the features present in the geometry. The relevant derivation is illustrated in (254), presenting the end-result for both possible orders.

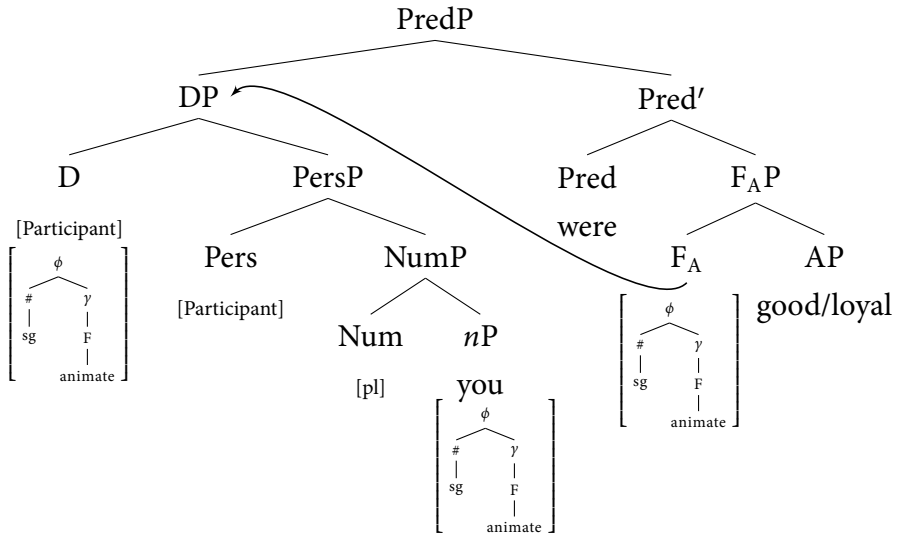
(253) a. Vy jste byla **dobrá**.
you aux.2.PL been.F.SG good.F.SG
'You (female referent) were good.' [Czech] (Comrie 1975:408)

b. Vous êtes **loyal**.
you aux.2.PL loyal.M.SG
'You (male referent) are loyal.' [French] (Comrie 1975:409)

(254) Agreement of predicate adjectives in natural gender and number:

a. Gender Agree > Number Agree: Match [γ:F[anim]] + Copy [#:sg]

b. Number Agree > Gender Agree: Match [#:sg] + Copy [γ:F[anim]]

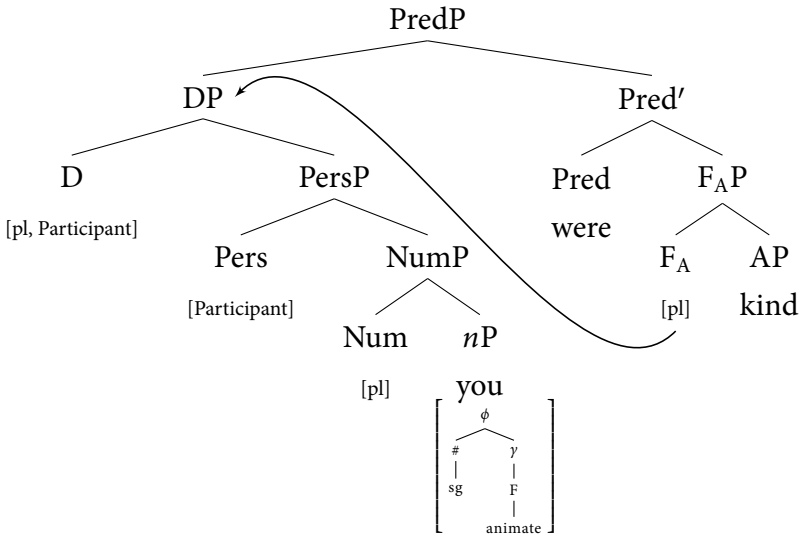


[94] Since I assume that D and DP are equidistant, D would be the one that provides features for the adjective. However, for ease of exposition, the features of the DP will be indicated as the goal.

In the situation in which the F_A-head is supposed to agree with the honorific pronoun whose DP has inherited only the grammatical plural number (and second person) feature [γ:∅, #:pl, π:Participant], the outcome of both possible orders of operations will be the failure of Gender Agree and the valuation of the number probe with the grammatical number feature. Thus, if Gender Agree applies first, it will fail since no gender feature exists on the D goal, nor is there any other gender-bearing phrase that c-commands the F_A-head (see Baker's revised c-command condition (251) and (252) above). Number Agree will copy the [#:pl] number feature from the DP. Under the reverse order of operations, Number Agree will manage to copy the grammatical plural feature from the DP. The Gender Agree will inevitably fail after this point, due to a conspiracy of the c-command condition on Agree (*n*P does not c-command F_AP) and the CAD (Agree cannot reach anything below the phrase that has already been targeted). The gender feature will have to be provided by the morphology as the default exponent. This derives the grammatical plural and default masculine agreement pattern, exemplified by BCS below.

(255) Vi ste vrlo **ljubazni**.
you.2.PL aux.2.PL very kind.M.PL
'You (single addressee) are very kind.' [BCS]

(256) Agreement of predicate adjectives in grammatical plural number:
a. Gender Agree > Number Agree: Fail to copy gender + Copy [#:pl]
b. Number Agree > Gender Agree: Copy [#:pl] + Fail to copy gender



To conclude, deriving the patterns of formal and semantic agreement of the honorific pronoun with predicate adjectives proves to be possible under the theory being developed here, in combination with the proposal for the structure and the manner of agreeing of predicate

adjectives adopted from Baker (2003, 2008). The dependences between DP-internal and DP-external agreement prove to be crucial once again. The result of DP-internal agreement, and the decisions made early in the derivation, will have an impact on all the following derivation steps, as (254) and (256) schematise. In these two cases, however, the results of Agree operations applied early will feed particular patterns on predicate adjectives, leaving these probes indifferent with respect to the order in which they will carry out their operations – they simply do not matter. However, in the following section, I present another possible configuration, in which the order of operations does in fact bring about different outcomes.

Finally, the third possibility of agreement, namely agreement with a D that has only copied the [π:Participant] feature is an issue that requires further research. According to the setup of the system, both Gender Agree and Number Agree triggered from the F_A-head should fail under any order of operations. The reason for this is that no gender or number features are available on D, and the phrases that host them do not c-command the F_A-head. The result of this scenario should be default valuation of both number and gender on the adjective by the morphology (M,sg), due to the failure of both operations. At this point it is not clear that something like this happens in the languages under discussion. I will thus leave the investigation of this analytical option for future work.

6.5.3 Deriving two additional patterns: regular vs. unaccusative predicate adjectives

As mentioned in footnote 92 above, predicate adjectives do not always necessarily need to agree in an upward fashion. Baker (2008:67ff.) argues that some NPs selected by adjectives are not generated in Spec-PredP, but rather in the complement position of the A-head. The background of this proposal is the discovery of Cinque (1990) that some adjectives select for a subject argument, while others select for an object. Baker named the former *normal adjectives*, as opposed to *Cinque adjectives*, after their discoverer. Cinque himself refers to these as *ergative adjectives*, but such terminology is avoided by Baker in order to avoid confusion with ergative verbs, which exhibit different properties. I will refer to these adjectives as unaccusative adjectives, in order to maintain a very convenient parallel between them and unaccusative verbs.

The parallel between unaccusative verbs and adjectives is corroborated by syntactic tests such as *ne*-cliticization in Italian (Burzio 1986; Cinque 1990). This is an unaccusativity test, which some adjectives pass and others fail. The clitic *ne* in Italian is a quantificational clitic, which gets attracted to the finite verb in some contexts (usually when it quantifies the internal argument of a verb). *Ne*-cliticization reveals that the sole argument of intransitive verbs such as *telefonare* 'to phone' in (257c) behaves like the subject of a transitive verb (257b), as the two do not allow this process. On the other hand, the only argument of an intransitive verb such as *arrivare* 'arrive' in (257d) patterns with the object of a transitive verb (257a), in that

they both allow *ne*-cliticization. The verb in *telefonare* is therefore unergative, while *arrivare* is unaccusative (see Baker 2008:67-68 and references therein).

(257) a. Ne ha affondato due –.(object of transitive verb)
of.them have sunk two
'He/she has sunk two of them.' (Cinque 1990:5)

b. *Ne hanno avuto successo due –. (subject of transitive verb)
of.them have had success two
'Two of them had success.' (Cinque 1990:5)

c. *Ne telefonano molti –. (sole argument of agentive verb)
of.them telephone.3.SG many
'Many of them telephone.' (Burzio 1986:20)

d. Ne arrivano molti –. (sole argument of nonagentive verb)
of.them arrive.3.SG many
'Many of them arrive.' (Burzio 1986:20)

Similarily, as reported by Baker (2003, 2008), some adjectives in Italian recorded by Cinque (1990) pattern with unergative verbs when it comes to *ne*-cliticization (such as *buono* 'good' in (258)), while others pattern with unaccusative verbs, allowing *ne* to cliticize to the auxiliary (such as the case with *noto* 'famous' in (259)).

(258) a. *Ne sono buoni pochi (dei suoi articoli).
of.them are good.M.PL few of his articles.M.PL
'Few of them (his articles) are good.'

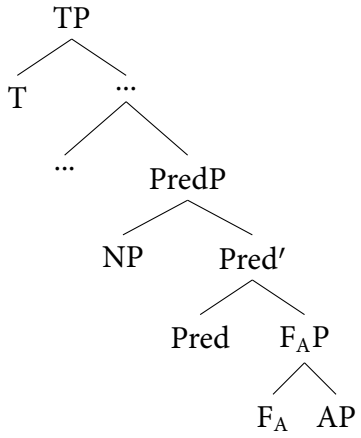
b. *Ne sono pericolosi molti (di viaggi).
of.them are dangerous.M.PL many of journeys.M.PL
'Many of them (journeys) are dangerous.' (Cinque 1990:7)

(259) a. Ne sono note solo alcune (delle sue poesie).
of.them are well.known.F.PL only some of his poems.F.PL
'Only some of them (his poems) are well known.'

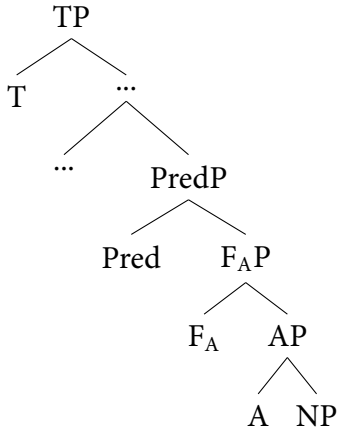
b. Ne é oscuro piú d' uno (di motivo).
of.them is obscure.M.PL more than one of reason.M.PL
'More than one of them (reasons) is obscure.' (Cinque 1990:7)

Baker (2008) argues that tests like the one above show that the NP argument of the adjective in (259) is generated as its complement, i.e. as the internal argument. The difference between the normal adjectives (258) and unaccusative adjectives (259) is presented in (260) and (261), respectively.

(260) normal predicate adjectives



(261) unaccusative adjectives



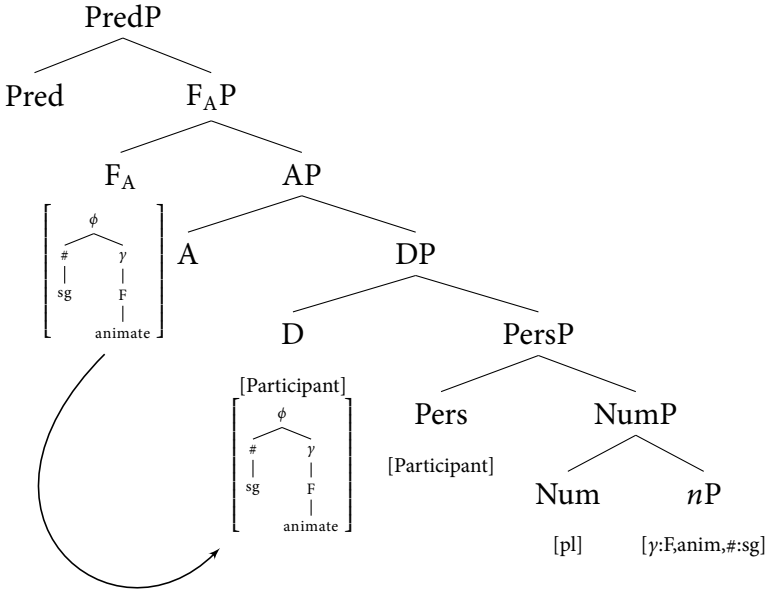
Since we have already dealt with the normal predicate adjectives (260) in previous sections, in this section we focus on deriving the patterns of agreement with unaccusative adjectives. What is immediately striking in (261) is that the F_A-head does have a goal to agree with in its c-command domain. Based on this fact, Baker (2008) claims that downward agreement is in fact possible with the NP goal in this configuration. As a consequence for our theory, if such an adjective is merged with a honorific pronoun as a subject, it will be able to see the DP[95] with all the features it has projected. In addition to that, it can also potentially access the NumP and the *n*P, on the condition that there are no intervening features on higher heads. The subject DP will bear either the natural gender and number features, or the grammatical plural number, and person features, depending on the order of operations that have applied on the D-head. If the DP in the complement of the adjective has projected semantic gender and number and second person features [γ:F/M,anim, #:pl, π:Participant], semantic number and gender are the only features the adjective can copy with any order of operations. What comes out as a result is semantic agreement on the predicate adjective. Note that the two possible derivations in (262) bear resemblance to the derivations of the Agreement Hierarchy effects in Part 2 if the dissertation. Once the more complex semantic feature is projected on a higher level of the DP, agreement in purely formal features will no longer be an option for the DP-external probes.

[95] Baker (2008) abstracts away from the issue of whether the complement of the adjective is an NP or a DP. This issue is not of importance for my current discussion either, so I keep referring to the subject honorific pronoun as a DP, in accordance with the assumptions made hitherto.

(262) unaccusative adjectives

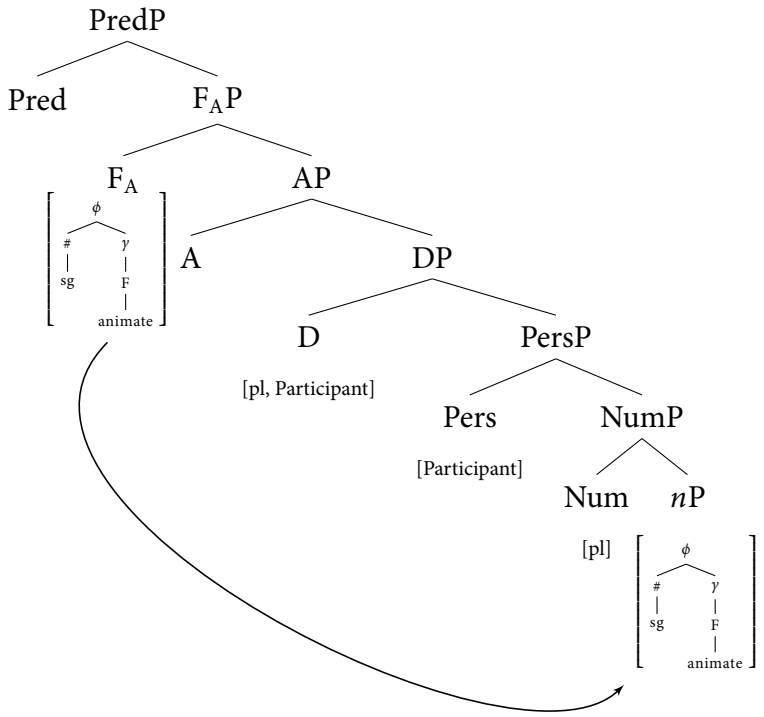
a. Gender Agree > Number Agree: Match [γ:F[anim]] + Copy [#:sg]

b. Number Agree > Gender Agree: Match [#:sg] + Copy [γ:F[anim]]

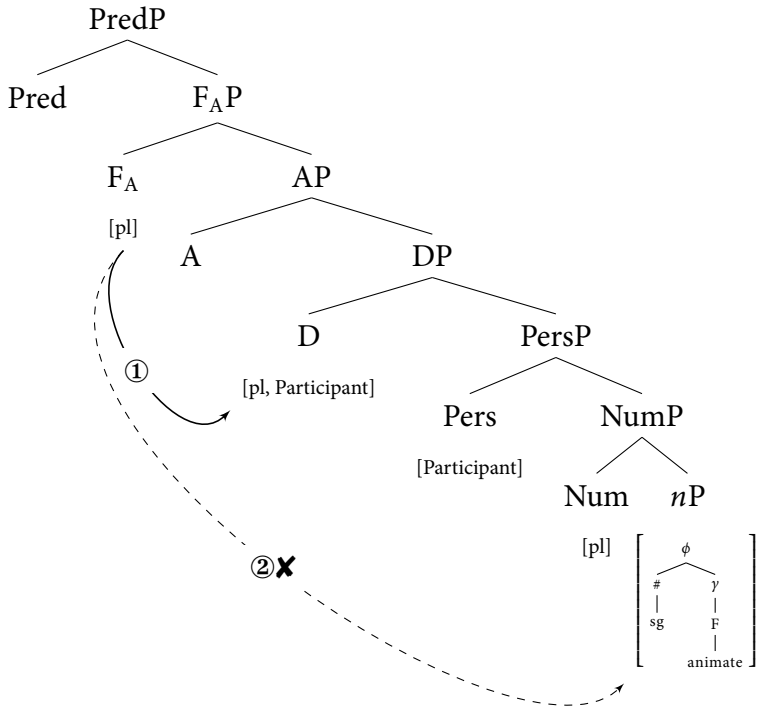


In the alternative scenario, if the DP has projected only the grammatical number and person feature, the natural gender and number features are still going to be available to the F_A-head if Gender Agree is ordered first. This is exactly what happens in the derivation in (263). Gender Agree, as the first operation, probes past the DP, down to *n*P, where it finds the natural gender features, connected to natural number. This operation will therefore copy the whole feature geometry, rendering Number Agree unnecessary by saturating the number probe with a number value. On the other hand, if Number Agree is the first one to apply, it will copy the plural number from the DP, as this is the minimally closest feature it can find, as in (264). Gender agreement will be prohibited by the CAD, which will ban Gender Agree from probing below the DP, leading this operation to a failure and causing the adjective's gender feature to be valued by the morphologically default masculine gender feature.

(263) unaccusative adjectives: Gender Agree > Number Agree



(264) unaccusative adjectives: Number Agree > Gender Agree



Two derivations in (263) and (264), represent the two missing pieces needed to form the full

spectrum of possibilities for agreement of predicate adjectives. Two additional derivations are possible, those in which the D head bears only [π:Participant] feature. This configuration will give essentially the same results as the (263) and (264) above, with a single difference – that the number probe will locate the closest available matching feature on Num instead of D.

6.5.3.1 Interim summary and implications for language variation

The model proposed in the previous two subsections combines the theory of agreement I have developed so far, in which the relativized probing and ordering of Agree operations in combination with the CAD yield patterns of formal and semantic agreement on different probes, with the insights of Baker (2003, 2008) on the structure of predication and agreement relations that hold within it. We have established that the subject (in my case the honorific pronoun as a hybrid agreement controller) can be merged either as the external or the internal argument of the adjective. In the former case, it is base-generated in the specifier of the phrase that establishes the predication relation, i.e. the PredP, while in the latter, it is base merged as a complement to the A-head. In both cases, there is a c-command relation between the honorific pronoun, i.e. DP the goal, and the functional head F_A, i.e. the probe that triggers Agree. In the former case Agree applies upwards, while in the latter it applies downwards (cf. Baker's revised c-command condition in (251) above). The order of operations on the predicate adjective's F_A-head is free, but the resulting pattern will be heavily influenced by the result of the DP-internal agreement and the features that the DP has projected.

The derivations proposed above model the different possible derivational directions that our syntactic items can take in order to build full clauses, as well as their possible outcomes, but the task that still remains is to restrict those patterns in a language-specific manner. In agreement with participles this task was somewhat easier, as it was possible to isolate two extremes: from languages that completely reject semantic agreement to languages that only allow this option, while languages that show optionality were situated somewhere between the two (see Table 6.5 in Section 6.4.1 for an overview). Yet, according to the summary of literature provided by Wechsler (2011:1003), with predicate adjectives, the situation is slightly different, as noted in the introductory section. In all languages under survey (except for Russian short form adjectives) semantic agreement is at least possible, if not preferred.

At this point, I will maintain my assumption that languages in which predicative adjectives always agree in semantic features most probably have Gender Agree always ordered before Number Agree (most probably both on D and other probes). These languages, as before, would include French, Italian (dialects), Modern Greek, Romanian. By extension, languages which allow for variation on the predicate adjective should allow for both orders of operations on D, which will then determine the kind of agreement that the adjective will show. The final logical possibility is a language that would always order Number Agree before Gender Agree. Since in our overview a language of this kind does not seem to be attested, I leave it to future research to further test this prediction and its implications.

Under the proposal developed so far, the order of operations on the adjective is not essential in the way that the order of operations on the DP is. We will return to this issue in Section 7.1 below, after the discussion on the final agreement target, the predicate noun, where we will unify the causes for optionality in agreement with all the different types of predicates that make up the Predicate Hierarchy.

6.6 Agreement with predicate nouns

As the final link in the Predicate Hierarchy chain stands the predicate noun. This type of predicate always agrees with the hybrid agreement controller in semantic features, as seen in the previous surveys, summarised by Wechsler (2011:1003) and cited in Table 5.1. In this section I will provide some empirical detail on this type of agreement, which will reveal that the semantic agreement on predicate nouns in not a result of valuation of a narrow-syntactic probe with natural gender and number features, as has been the case with all the agreement targets until now. Instead, I argue that the agreement between the features of the honorific pronoun and the predicate noun is regulated by pragmatic constraints.

More specifically, in agreement with an honorific pronoun that refers to a single entity, the absence of plural number on the predicate noun is not ruled out due to ungrammaticality, but rather due to its semantic inadequacy. Plural agreement is not ruled out by the syntax, since a plural noun may appear as a predicate with a plural subject pronoun in general. However, with a plural predicate NP, the subject 2nd person honorific pronoun loses its intended meaning of having a single addressee. On these grounds, I assume that the relationship between the number of the subject and the predicate is regulated by pragmatic constraints. If the predicate noun refers to a singular entity, the honorific pronoun must also be interpreted as denoting a singular referent. A very similar situation will hold in gender agreement. If the gender on the predicate noun introduces a particular presupposition, this presupposition has to match the one introduced by the natural gender on the honorific pronoun. On the other hand, if the predicate noun only bears the unmarked grammatical gender, no presupposition clash will obtain, and the gender of the subject pronoun and of the predicate noun do not have to match.

6.6.1 Number agreement

The overview of Predicate Hierarchy effects in different languages in Table 5.1 at the beginning of Part 3, clearly showed that every language from the survey admitted only a singular noun as a predicate to the honorific pronoun referring to a single person. Regardless of the agreement properties of their adjectives and participles, all the languages under survey will have a singular noun in the predicate position (cf. Czech (265), French (266), Romanian (267) and BCS (268)).

(265) Vy jste byla učitelka.
you aux.2.PL been.F.SG teacher.F.SG
'You (single female referent) were a teacher.'
*'You (multiple female referents) were teachers.' [Czech] (Comrie 1975:408)

(266) Vous êtes (le) professeur.
you aux.2.PL the professor.M.SG
'You (single male referent) are a professor.'
*'You (multiple male referents) are professors.' [French] (Comrie 1975:409)

(267) Dumneavoastră sînteți profesor
you.POLITE.2.PL aux.2.PL professor.M.SG
'You (single male referent) are a professor.'
*'You (multiple male referents) are professors.' [Romanian] (Comrie 1975:409)

(268) Vi ste profesorica.
you.2.PL be.2.PL professor.F.SG
'You (single female referent) are a professor.'
*'You (multiple female referents) are professors.'

All of the examples above refer to a single person, therefore having a plural noun as a predicate is unacceptable. However, if the pronoun denotes multiple referents, regardless of whether they are addressed in a direct or a honorific manner, it is possible, in fact obligatory, for the predicate noun to bear plural number:

(269) Vy jste byly učitelky.
you aux.2.PL been.F.PL teacher.F.PL
*'You (single female referent) were a teacher.'
'You (multiple female referents) were teachers.' [Czech]

(270) Vi ste profesorice.
you.2.PL be.2.PL professor.F.PL
'You (multiple female referents) are professors.'
*'You (single female referent) are professors.' [BCS]

The examples above indicate that the second person pronoun is in fact capable of controlling both types of agreement – singular and plural, in different contexts, contingent on its own meaning, i.e. the referent. When the pronoun denotes a single referent and thereby bears natural singular number, the only number licensed on the predicate noun is singular. Conversely, when the same pronoun denotes multiple referents, it will require a plural noun as a predicate.

Crucially, from its form alone, it is not possible to tell what the pronoun *Vi* refers to without having provided a particular context. The context in this case is the predicate noun itself. Put differently, the honorific pronoun can trigger both singular and plural agreement, and it can have either a singular or a plural noun as its predicate. Therefore, from the point of view of

syntax both types of agreement are possible, as shown in (265)–(270), as both options can be derived by syntactic processes. However, the pronoun with the singular predicate noun is incompatible with plural interpretation, while the pronoun with a plural predicate noun is incompatible with a singular interpretation, which indicates that the restriction is of a pragmatic nature.[96]

In accounting for this state of affairs, I follow Baker (2008) and Wurmbrand (2017) in their claims that a predicate noun is actually not a proper probe in the narrow-syntactic sense of the word, in the same way as the T, Part and Adj we encountered before. Since it already has its own inherent ϕ-features, it does not have the need to act as a probe and value any unvalued features. It follows then that the 'agreement' between the honorific pronoun and the predicate noun is not a result of any narrow-syntactic Agree operations. What must be at work in regulating the agreement options is a certain pragmatic constraint that forces the actual natural number of the pronoun to match the natural number of the predicate noun. As the analysis I am proposing here is mostly trying to explore the boundaries of syntax in modelling hybrid agreement, I will leave the exact nature and the formalisation of such semantic constraints for further research.

6.6.2 Gender agreement

While natural number of the honorific pronoun must match the number of the predicate noun, the natural gender of the pronoun does not have to match the noun's *grammatical gender*. This is illustrated by examples (271)–(273) below, obtained in a web search. The feminine agreement on the participle in examples (271) and (272) indicates that the referent is female, nevertheless, a masculine noun can act as a predicate (e.g. *poznavalac* 'expert.M.SG' in (271)). In (273) the situation is reversed. The masculine agreement on the participle points to the masculine gender of the referent, but the predicate noun can bear (grammatical) feminine gender (e.g. *osoba* 'person.F.SG').

(271) Vi ste **bila** uspešna i cenjena balerina,
you.2.PL aux.2.PL been.F.SG successful.F.SG and reputable.F.SG ballerina.F.SG
pisateljica i **poznavalac** svetskih kultura.[97]
writer.F.SG and expert.M.SG of.world's cultures
'You were a successful and reputable ballerina, writer and an expert on world's cultures.'

[96] It must be then that the number feature on the honorific pronoun carries with it a certain inference. However, as noted by Sudo (2012:166) (and references cited therein), the nature of plurality inferences is still quite controversial in the semantics literature.

[97] http://www.koreni.rs/sonja-lapatanov-veciti-putnik/, accessed 12.04.2017

(272) Branila se Jugoslavija gospodjo Vjera i vi ste bila Titova
defended refl Yugoslavia madam Vjera and you.2.pl aux.2.pl been.f.sg Tito's.f.sg
pionirka[98]
pioneer.f.sg
'Yugoslavia was being defended, madam Vjera, and you were Tito's pioneer.'

(273) Vi ste **bio** prepoštena **osoba**, domoljubne
you.2.pl aux.2.pl been.m.sg too.honest.f.sg person.f.sg of.patriotic
provenijencije, što nije odgovaralo ljudima kojima ste bili
provenance which not.is suited peope by.who aux.2.pl been.m.pl
okruženi.[99]
surrounded
'You (male referent) were too honest a person, of a patriotic provenance, which did not suit the people you were surrounded with.'

Since a noun of any gender seems to be capable of acting as a predicate to the honorific pronoun, a conclusion that can be drawn from the examples above is that a mismatch in gender features of the honorific pronoun and the predicate noun is in principle tolerated. However, there is data to suggests that the generalisation must be made more precise since the matching condition seems to be sensitive to the distinction between grammatical and natural gender on both the subject pronoun and the predicate noun.

Nouns with the semantically unmarked grammatical gender seem to be more permissive. Looking back to (271) and (273), the nouns *poznavalac* 'expert.m.sg' and *osoba* 'person.f.sg' seem to be of such kind. This is confirmed by the fact that they can act as predicates for either male or female referents, as illustrated by (274).

(274) a. Novo je poznavalac svetskih kultura.
Novo.m.sg aux.2.sg expert.m.sg of.world's cultures
'Novo is an expert on world's cultures.'

b. Vojna je poznavalac svetskih kultura.
Vojna.f.sg aux.2.sg expert.m.sg of.world's cultures
'Novo is an expert on world's cultures.'

c. Novo je prepoštena osoba.
Novo.m.sg aux.2.sg too.honest.f.sg person.f.sg
'Novo is too honest a person.'

d. Vojna je prepoštena osoba.
Vojna.f.sg aux.2.sg too.honest.f.sg person.f.sg
'Vojna is too honest a person.'

Moreover, even if they act as subjects, they do not impose any restrictions on the gender of their referents. Nouns like these can denote either an all-male, all-female or a mixed group of

[98] http://www.autonomija.info/stasa-zajovic-vojvodina-mora-da-se-oduzi-vukovaru-i-sebi.html, accessed 12.04.2017.

[99] http://narod.hr/hrvatska/branko-hrg-udarac-direktno-srce-hss-a-smisljena-namjera-da-se-ide-unistavati-stranka, accessed 13.04.2017

referents in the plural, as exemplified by (275).

(275) a. Poznavaoci svetskih kultura su se žučno raspravljali.
expert.M.SG of.world's cultures aux.2.SG refl heated debated.M.PL
'The experts on world's cultures (all-male group/all-female group/mixed group) were having a heated debate.'

b. Prepoštene osobe često imaju probleme.
too.honest.F.PL persons.F.PL often have.3.PL problems
'Too honest persons (all-male group/all-female group/mixed group) often have problems.'

Tests like the ones in (274) and (275) above are similar to those used by Bobaljik and Zocca (2011); Merchant (2014); Sudo and Spathas (2016) when trying to determine the level of markedness of a particular gender feature. In their terms, the grammatical masculine gender on *poznavalac* 'expert.M.SG' and the grammatical feminine gender on *osoba* 'person.F.SG' would be instances of unmarked gender features, the ones that do not carry any semantic meaning with them, but act as purely formal morphosyntactic features instead. As opposed to them, the natural gender features would be the ones which introduce an additional presupposition to the basic interpretation of the noun, and which correspondingly impact the interpretation.

There are in fact nouns in BCS with which this difference is easily observable. These are gender variable nouns, such as *mušterija* 'customer', which are grammatically feminine, but they can optionally control masculine agreement if their referent is male (see Murphy et al. to appear for more detail on the agreement patterns of such nouns and evidence on markedness of natural gender). With male referents, such nouns may control either grammatical feminine agreement (276a-b), or natural masculine gender agreement (276c-d).

(276) a. Milan nam je nov-a mušterija.
Milan us is new-F customer
'Milan is our new customer.'

b. Nov-a mušterija je kupila jaknu.
new-F customer is bought.F jacket.
'A new (male or female) customer bought a jacket.'

c. %Milan nam je nov-i mušterija.
Milan us is new-M customer
'Milan is our new customer.'

d. %Nov-i mušterija je kupio jaknu.
new-M customer is bought.M jacket.
'A new (male) customer bought a jacket.' (Murphy et al. to appear)

If such nouns act as predicates to the honorific pronoun in BCS, both if the agreement possibilities are still available. Since these nouns have a single invariable morphological form, whether the noun bears only the grammatical feminine gender, or an additional natural masculine gender can be concluded from the agreement on the predicate adjective. What the

sentences in (277) show is that the grammatical gender on the predicate noun imposes no restrictions on the gender of the honorific pronoun, as it is compatible with both interpretations in (277a). However, natural masculine gender agreement in (277b) forces the honorific pronoun to be interpreted as referring to a masculine person only.

(277) a. Vi ste naša nova mušterija.
you.2.PL aux.2.PL our.F.SG new.F.SG customer.F.SG
'You (female or male referent) are our new customer.' ✓ Vi: F ✓ Vi: M

b. Vi ste naš novi mušterija.
you.2.PL aux.2.PL our.M.SG new.M.SG customer.F.SG
'You (male referent) are our new customer.' ✘ Vi: F ✓ Vi: M

Several gender markedness tests (see Bobaljik and Zocca 2011; Merchant 2014; Sudo and Spathas 2016) support the claim that feminine is the unmarked gender on these nouns, while the natural masculine gender introduces an additional presupposition that the referent is male (also see Sauerland 2003, 2008; Heim 2008; Kratzer 2009; Spathas 2010; Sudo 2012). For start, a plural gender variable noun can denote a group of either male, female or mixed referents when it controls feminine agreement, while an all-female interpretation is unavailable with masculine agreement:

(278) a. Mušterije su se posvađale.
customers are refl argued.F.PL
'Customers (male group/female group/mixed group) had an argument.'

b. Mušterije su se posvađali.
customers are refl argued.M.PL
'Customers (male group) had an argument.'[100]

Furthermore, in negative existential sentences, the unmarked gender should not restrict the domain of quantification only to particular individuals. As we see in (279), feminine gender indeed shows no restrictions, while in (280), masculine restricts the referents to males.

(279) Petar nema novu mušteriju.
Petar not.has new.F.SG customer
⇒ 'Petar does not have a male customer.'
⇒ 'Petar does not have a female customer.'

(280) Petar nema novog mušteriju.
Petar not.has new.M.SG customer
⇒ 'Petar does not have a male customer.'
⇏ 'Petar does not have a female customer.'

[100] Theoretically, masculine agreement here could also denote that the group is mixed, in which case the given agreement would not be agreement in natural gender, but rather default agreement. I leave the issue of default agreement for further research, while noting that masculine agreement seems to be less restricted than feminine with these nouns.

Finally, focus alternatives can be used as a test following Sudo and Spathas (2016:719). Under the assumption that ϕ-features are presuppositions, they should not be ignored in focus alternatives.

(281) a. Only John is a male athlete. ⇏ Mary is not a female athlete.
b. Only Mary is a female athlete. ⇏ John is not a male athlete.

The focus test also seems to indicate that feminine gender is the less marked one with these hybrid nouns.

(282) Jedino Petar je nova mušterija.
only Petar is new.F.SG customer
'Only Petar is a new customer.'
⇒ Marko is not a new customer.
⇒ Marija is not a new customer.

(283) Jedino Petar je novi mušterija.
only Petar is new.M.SG customer
'Only Petar is a new customer.'
⇒ Marko is not a new customer.
?⇏ Marija is not a new customer.

In conclusion, the denotation of the noun *mušterija* 'customer' can differ on the basis of gender it bears. The presence of grammatical gender alone does not affect the interpretation, and the noun only denotes a customer (284a). In contrast, natural gender introduces an additional presupposition that the referent is male (284b).

(284) a. $[\![\text{mušterija}]\!] = \lambda x_{\langle e \rangle}$: x is customer(x)
b. $[\![\text{mušterija}]\!] = \lambda x_{\langle e \rangle}$: x is male. customer(x)

With these facts in mind, we may return to the initial puzzle of this section, why is natural gender more restricted on nominal predicates? The solution to it might have to do with the additional gender presupposition that the natural gender introduces. Once this presupposition is introduced on the predicate noun, it must be present on the subject as well. If this subject is the honorific pronoun, this explains why the feminine interpretation is unavailable with natural masculine gender, repeated in (285b).

(285) a. Vi ste naša nova mušterija.
you.2.PL aux.2.PL our.F.SG new.F.SG customer.F.SG
'You (female or male referent) are our new customer.' ✓ Vi: F ✓ Vi: M

b. Vi ste naš novi mušterija.
you.2.PL aux.2.PL our.M.SG new.M.SG customer.F.SG
'You (male referent) are our new customer.' ✘ Vi: F ✓ Vi: M

The presence of natural feminine gender on the pronoun in (285) would cause a presupposition clash, and thus the sentence would be impossible to interpret. On the other hand, since the gender in (285a) is unmarked, it is compatible with any gender presupposition on the pronoun, and no clash will emerge.

To sum up, in this section we have tried to explore some of the causes of restrictions of predicate nouns to show genuine semantic agreement, both in gender and in number, with the

honorific pronoun as a subject. As for gender, if the predicate noun bears only grammatical gender, but not natural one, no restriction will be imposed and the pronoun is allowed to have both interpretations. However, as soon as the predicate noun receives an additional gender presupposition that restricts its referents to a set of males or females, the pronoun must bear the exact same specification. I assumed that this is due to a pragmatic condition that requires that once a gender presupposition has been introduced, it must be maintained on both elements in the predication relation. While the exact formalisation of this semantic condition will be left for future research, note that this conclusion is in accordance with the results of an experimental study by Murphy et al. (to appear), who argue that the same condition holds in ellipsis. Their conclusion is that once a certain gender presupposition is introduced in the ellipsis antecedent, it must be maintained in the ellipsis site, and conversely, if a presupposition has not been introduced in the antecedent, it cannot be added to the noun in the ellipsis site. This goes to suggest that there is a strong identity requirement when it comes to gender features, but, as we have seen above, with number as well. This identity requirement is evaluated by pragmatics, which consequently makes predicate noun agreement independent of any syntactic processes.

6.7 Summary

This chapter has aimed to provide a derivational account of the Predicate Hierarchy as formulated by Corbett (1983, 2006):

(286) *The Predicate Hierarchy*:
FINITE VERB > PARTICIPLE > ADJECTIVE > NOUN
'For any controller that permits alternative agreements, as we move rightwards along the Predicate Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically (that is, with no intervening decrease).'
(Corbett 1983:43ff., Corbett 2006:231)

The hybrid agreement controller that the effects of the Predicate Hierarchy were demonstrated on has been the honorific pronoun in various languages (mostly from the Indo-European family) collected by Comrie (1975); Corbett (1983); Wechsler (2011). The extensive classification provided by Wechsler (2011:1003), supplemented by data from the current usage of native speakers was reorganised as presented in Table 5.2, repeated below. What the summary has shown is that the finite verb consistently shows formal agreement, while the predicate noun always matches in semantic features. The targets in between vary in the kind of agreement they show.

Group 1	finite verb ||	participle	adjective	noun
French	PL	SG	SG	SG
Romanian	PL	SG/(PL?)	SG	SG
Italian dialects	PL	SG	SG	SG
Modern Greek	PL	SG	SG	SG
Czech	PL	SG	SG	SG
Group 1a	**finite verb**	**participle**	**adjective ||**	**noun**
?	PL	PL	PL	SG
Group 2	**finite verb**	**participle ||**	**adjective**	**noun**
Ukrainian	PL	PL	SG	SG
Belorussian	PL	PL	SG	SG
Russian	PL	PL	short form PL 97%	SG
			long form SG 89%	SG
Slovak	PL	PL	SG	SG
Group 3	**finite verb**	**participle**	**adjective ||**	**noun**
Icelandic	PL	n.a.	PL / SG	n.a.
Lower Sorbian	PL	PL	PL / SG	SG
Macedonian	PL	PL	(PL) / SG	SG
Bulgarian	PL	PL / SG	SG	SG
Upper Sorbian	PL	(PL) / SG	(PL) / SG	SG
Polish dialects	PL	PL / SG	PL / SG	SG
BCS	PL	PL / (SG)	PL / (SG)	SG
Slovenian	PL	PL / (SG)	PL / (SG)	SG

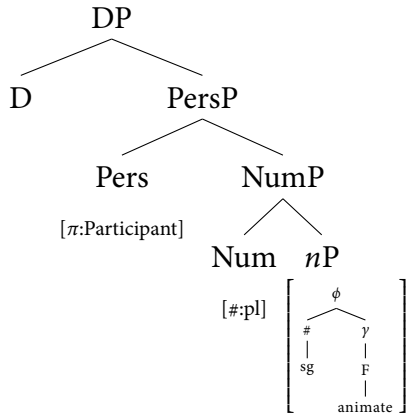
Table 6.6: Predicate Hierarchy effects

In order to account for the given patterns, I have extended the previously developed theory in order to accommodate the structure and agreement properties of pronouns. I have proposed that pronouns in languages above are full DPs, under the classification of Déchaine and Wiltschko (2002). Local person pronouns encode only natural gender on the *n*P, but lack the GenP. Instead, they project a PersP, which encodes their person features. The PersP is only projected if it encodes a [π:Participant] feature (thus second person can be represented by [π:Participant], while the first person involves an additional node: [π:Participant[Speaker]]). As a consequence, GenP and PersP are in complementary distribution. Another way to model this dependency is to say that [π:Participant] and grammatical gender features are in complementary distribution, which indicates that they can be thought of as two different instances of the same category, i.e. that grammatical gender is a type of person.

The structure of the DP makes it possible to explain the cause of mixed agreement patterns triggered by the honorific pronoun. This hybrid agreement controller has been assumed to have semantic singular number and natural gender encoded together in a feature geometry present on the nominalizer. Yet, like all other 2nd person pronouns, it also has the plural number present on the higher functional projection, the NumP. Therefore, there are two possible

number features that the probes can copy, as repeated in (287).

(287) Honorific 2nd person pronoun:



Furthermore, having semantic features connected in a geometry together opens a possibility for explaining how and why a probe always copies exclusively semantic or exclusively formal features (Despić 2017). Valuation of any probe's features is determined by the Condition on Agree Domains (48) and the Condition on Full Valuation (37). After an Agree operation has copied features from a certain head, any later Agree from the same probe must not target any heads c-commanded by the previous goal. Moreover, a probe can neither enter an Agree relationship with a goal that only has a subset of features it searches for, nor can a goal value the probe with only a subset of its own features. These conditions have two immediate consequences. If an Agree operation targets the bundle of semantic features on *n*, all of them will be copied together, if the probe has identical feature requirements, as per the CFV. Thus D, Part and the adjective will be able to copy the entire snippet. If Agree targets the Num head and the formal number feature on it, the CAD will block the access to natural number and gender, resulting in formal plural number and default gender valuation on D, Part and the adjective.

Patterns of agreement in the Predicate Hierarchy mostly depend on the result of agreement on D. In this sense, D will determine the possible agreement options on the different predicate probes. However, the probes themselves do not necessarily need to interact. This is where the Predicate Hierarchy and the Agreement Hierarchy seem to differ, because the latter depended on the transfer of features from probe to probe. Yet, since the interaction between the probes in the former has not been tackled in detail in the previous passages, Section 7.1 will offer more detail on this issue.

As for the mechanics of Agree on individual probes, the D is the only probe that carries out all three ϕ-Agree operations. This probe determines the agreement options for other probes by projecting either the full set of ϕ-features (by letting Gender Agree apply before all other operations), only the formal plural number and person features (by applying Number Agree at the start), or only the person features (if Person Agree precedes all others). The features

that D has projected will not have much effect on agreement on T, as T will always copy the formal plural value and the person value from the pronoun. Number Agree is always given primacy, after which Person Agree will copy the person feature (either from the Pers head or from D). Importantly, T cannot copy the natural singular number since this would violate the Condition on Full Valuation – the natural gender feature that the singular number would have to pied-pipe has no place in T's unvalued features container. Therefore, such a derivational step is excluded since the goal would only value the probe with a subset of its features.
The Part head will operate only on gender and number features. The possible results of orderings of Agree with respect to the specification of D are repeated in Table 6.7 below. As the table shows, whenever the D projects a full set of features, the ordering of Agree on Part becomes irrelevant since the more complex natural gender and number features are the closest goal. In other cases ordering Gender Agree first will yield semantic agreement, while the reverse order will yield formal agreement.

	Gender Agree > Number Agree	Number Agree > Gender Agree
D[γ:∅, #:∅, π:Participant]	[γ:F/M, animate, #:sg]	[γ:∅, #:pl]
D[γ:∅, #:pl, π:Participant]	[γ:F/M, animate, #:sg]	[γ:∅, #:pl]
D[γ:F/M, #:sg, π:Participant]	[γ:F/M, animate, #:sg]	[γ:F/M, animate, #:sg]

Table 6.7: Possibilities for agreement on Part

Predicate adjectives come in two possible configurations in which they can interact with the subject honorific pronoun. When the pronoun is merged as the specifier of the PredP to which the AP is a complement, the adjective will agree with the DP that c-commands it in an upward fashion (cf. Baker's revised c-command condition (251) above). As a result, the adjective will only be able to copy the features that D has copied. In an additional configuration, where the adjective actually directly selects the subject DP as its complement, it will behave just like the Part head above, yielding the same results.
Finally, we have seen some evidence that agreement with the predicate DP does not really involve valuation of ϕ-features of the predicate noun via syntactic Agree, but rather semantic matching of the gender and number presupositions of the honorific pronoun and the predicate noun.

6.8 Appendix: Russian long-form and short-form predicate adjectives

In the summary of Predicate Hierarchy effects in various languages surveyed by Comrie and Corbett (Wechsler 2011:1003), only Russian short-form adjectives seemed to resist semantic agreement in 97% of cases. As an attempt to explain the drastic difference in agreement between two types of predicate adjectives in this language, this section sketches an approach

to Russian predicate adjectives, combining some insights from previous literature on Russian with the proposal developed in previous sections. The problem is the following. In Russian, the so-called 'short-form' (SF) predicate adjectives always agree in grammatical plural number with the honorific pronoun (288), while the 'long-form' (LF) adjectives agree in singular and in natural gender (289):

(288) a. Vy – molody.
you.2.PL young.SF.PL
'You (single addressee) are young.'
'You (multiple addresses) are young.'

b. *Vy – molod-∅/-a.
you.2.PL young-SF.M.SG/-SF.F.SG
'You (single addressee) are young.' [Russian] (Bailyn 1994:13)

(289) a. Vy – molod-oj.
you.2.PL young-LF.M.SG
'You (single male addressee) are young.'

b. Vy – molod-aja.
you.2.PL young-LF.F.SG
'You (single female addressee) are young.'

c. *Vy – molodye.
you.2.PL young-LF.PL
'You (single addressee) are young.' [Russian] (Bailyn 2012:69)

In order to extend the account to the cases in (289), a few general points on adjectival modification in Russian are in order. There are two types of adjectival inflection Russian: short-form (SF) (290a) and (291a), and long-form (LF) morphology (290b) and (291b). In general, short-form adjectives are restricted to predicate position (290a), while in the attributive position they are ungrammatical (291a). Long-form adjectives, on the other hand, tend to be attributive (291b), although they may appear as predicates as well (290b).

(290) a. Devuška – umn-a.
girl smart-SF.F.SG
'The girl is smart.'

b. Devuška – umna-ja.
girl smart-LF.F.SG
'The girl is smart.'

(291) a. *umn-a devuška
smart-SF.F.SG girl
'a/the smart girl'

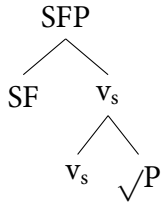
b. umna-ja devuška
smart-LF.F.SG girl
'a/the smart girl'
[Russian] (Bailyn 2012:68)

There is a general consensus in the literature that LF predicate adjectives are more 'adjectival' while SF adjectives are more 'verbal' in nature (Borik 2014:139, drawing on evidence from Babby 1975; Bailyn 1994, 2012; Pereltsvaig 2007; Geist 2010). Moreover, Geist (2010) and Borik (2014) identify some additional properties of LF and SF adjectives, which, as we will see below, come out naturally as a consequence of my proposal.

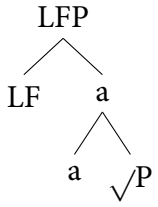
I follow Borik (2014) in analysing the SF predicate adjectives as having essentially a verbal syntactic base combined with adjectival morphology, while LF adjectives are canonical APs. I update this analysis with the proposal of Baker (2003) on the structure of predication and the relationship between adjectives and verbs as predicates.

The structure that Borik (2014) assumes for predicate adjectives in Russian is given in (292) and (293). SF adjectives are treated as a hybrid category, they start out as verbs, merging the root with a verbalising head, but the SF projection above the vP is what provides the SF adjectival affix to these structures. On the other hand, LF adjectives are typical adjectives, with the LF layer above them, which provides the additional LF morphology (we can think of this projection in terms of Baker's F_AP).

(292) SF adjectives (Borik 2014:153)



(293) LF adjectives (Borik 2014:156)



In the following two sections, I propose a slight update of this analysis in the spirit of Baker (2003), adopted in my proposal.

6.8.1 LF adjectives are adjectival

The aim of this section is to derive the restriction of the Russian long-form adjectives to semantic agreement with the honorific pronoun (294).

(294) a. Vy – molod-oj.
you.2.PL young-LF.M.SG
'You (single male addressee) are young.'

b. Vy – molod-aja.
you.2.PL young-LF.F.SG
'You (single female addressee) are young.'

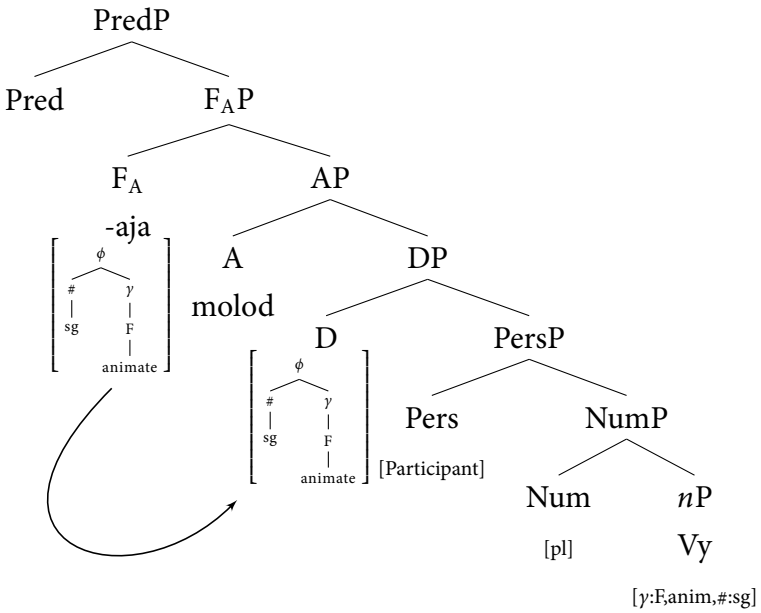
c. *Vy – molod-ye.
you.2.PL young-LF.PL
'You (single addressee) are young.' [Russian] (Bailyn 2012:69)

Following the bulk of the literature on adjectival modification in Russian, I assume that long-form predicate adjectives are essentially canonical adjectives, and correspondingly structured as such. Following Baker (2008, 2011), I assume that F_A-head is merged above the AP they project. This head can be thought of as equivalent to Borik's (2014) LF head (294), whose function is to perform the Agree operation and trigger the insertion of the additional *-oj* mor-

pheme. I depart from Geist (2010); Borik (2014), in the analysis of the position of the subject as the external argument. Instead, I assume that Russian LF adjectives are essentially unaccusative adjectives, whose subject is always merged as an internal argument. The F_A head thus must agree downward and copy the features from the honorific pronoun in A's complement position. Thus if the subject is a honorific pronoun 'Vy', it will be merged as the complement of A, as in (295). Furthermore, I assume that on the F_A-head Gender Agree always precedes Number Agree (as proposed in Section 6.5.3.1 above).

As a result, regardless of the order of operations carried out on the DP level, the probe that gives priority to Gender Agree will always be able to find and copy natural gender. In (295), I have illustrated this state of affairs in a derivation where DP projects its natural gender and number. However, even if the DP has projected the grammatical number, as for instance in the derivation (263) above, the probe would still be able to locate the natural gender features on the *n*P, as nothing would intervene. After agreement has taken place, the NP raises to the sentence-initial position, which derives the surface word order.

(295) long-form adjectives in Russian



The analysis proposed here has several benefits. It captures the fact that the LF adjectives in Russian are true modifiers, since the adjective is closely connected to the subject pronoun. It also conforms to the analyses of Borik (2014) and Geist (2010), who claim that long-form adjectives are true APs, which have additional morphology added to them (F_AP = Borik's LF-phrase). The origin of the copula in these constructions is in PredP. Finally, this approach also derives an interesting property of LF predicate adjectives noted by Borik (2014:141). She observes that both types of adjectives can appear in the predicative position, but only SF adjec-

tives can realise a complement in this position, while LF adjectives cannot do so, as illustrated in (296). Under my account, if the subject DP originates in the complement of A in (296a) (as in (295)), the subject must move out to the sentence-initial position, therefore there is nothing left in the complement position of the adjective to be realised.

(296) a. Otec byl gordyj (*svoim synom).
father.SG.NOM was.PST.M.SG proud.LF.M.SG.NOM (his.INS son.INS)
'The father was proud of his son.'

b. Otec byl gord svoim synom.
father.SG.NOM was.PST.M.SG proud.SF.M.SG.NOM his.INS son.INS
'The father was proud of his son.' (Borik 2014:141)

Conversely, in attributive position, the LF adjectives can appear with their complements, while SF adjectives are banned from these position in any respect. Assuming that here LF adjectives are modifiers, and as such they are adjoined to the given noun, nothing prevents them from projecting an internal argument. This internal argument need not undergo movement in this configuration, therefore it can easily be realised in its base position.

(297) a. Otec, gordyj svoim synom, ...
father proud.LF.M.SG.NOM his.INSTR son.INS
'a father proud of his son'

b. Gordyj svoim synom otec ...
proud.LF.M.SG.NOM his.INSTR son.INSTR father

c. *Otec, gord svoim synom ...
father proud.SF.M.SG.NOM his.INSTR son.INS

d. *Gord svoim synom otec ...
proud.SF.M.SG.NOM his.INSTR son.INSTR father
'a father proud of his son' (Borik 2014:142)

The approach to agreement of predicate adjectives developed in previous sections thus accounts for the agreement with long-form adjectives in Russian, deriving additionally several peculiarities of these constructions, noted in the previous literature.

6.8.2 SF adjectives are verbal

In order to account for the persistent grammatical agreement pattern on short-form predicate adjectives, I rely on the proposal of Baker (2003:83f.), that all lexical verbs in fact consist of an underlying combination of the abstract copula 'be' and an adjective. The formation of the lexical verb is the result of the incorporation of the adjective into the verb 'be' (the exact nature of this movement will be set aside; I will refer to it as head-movement for expository purposes, although it is most probably something equivalent to conflation in the sense of Hale and Keyser 1993).

The result of Baker's (2003) proposal is that the predications involving a copula and an adjec-

tive and lexical verbs essentially start out in the same manner and share the same underlying structure. The derivation for a sentence like 'Mary is hungry.' would proceed as follows:[101]

(298) a. Merge the Pred with AP: [$_{\text{Pred}}$ Pred [$_{\text{AP}}$ A]]
b. Insert vocabulary item for A and Pred: [$_{\text{Pred}}$ Pred$_{\varnothing}$ [$_{\text{AP}}$ hungry]]
c. Merge subject NP with Pred: [$_{\text{Pred}}$ [$_{\text{NP}}$ N] Pred$_{\varnothing}$ [$_{\text{AP}}$ A hungry]]
d. Insert vocabulary item for NP: [$_{\text{Pred}}$ [$_{\text{NP}}$ Mary] Pred [$_{\text{AP}}$ A hungry]]
e. Insert Aux, Tense, etc. (Baker 2003:87)

On the other hand, a verb derived from the same root, such as 'hunger' shares a similar underlying structure. It starts out as the combination of a predicative head and the AP as in (298a), but the vocabulary insertion applies only at a later step in the derivation. The sentence such as 'Mary hungers (for/after something)' would be the result of the following derivation:

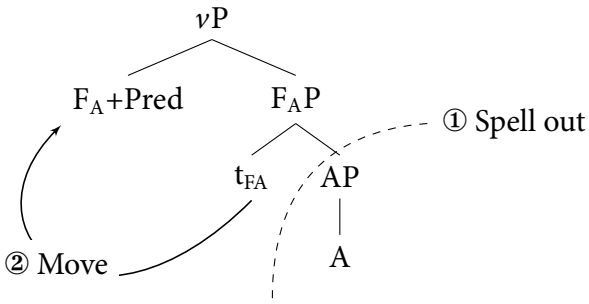
(299) a. (optional) Merge adjective with complement: [$_{\text{AP}}$ A (PP)]
b. Merge Pred with AP: [$_{\text{Pred}}$ Pred [$_{\text{AP}}$ A (PP)]]
c. Move A to Pred: [$_{\text{Pred}}$ A$_i$+Pred [$_{\text{AP}}$ t$_i$ (PP)]]
d. Insert vocabulary item for A+Pred: [$_{\text{Pred}}$ hunger [$_{\text{AP}}$ t$_i$ (PP)]]
e. Merge subject NP with Pred: [$_{\text{Pred}}$ [$_{\text{NP}}$ N] hunger [$_{\text{AP}}$ t$_i$ (PP)]]
f. Insert vocabulary item for NP: [$_{\text{Pred}}$ [$_{\text{NP}}$ Mary] hunger [$_{\text{AP}}$ t$_i$ (PP)]]
g. Insert Aux, Tense, etc. (Baker 2003:87)

According to this analysis, the difference between lexical verbs and copulas with an adjective is derived by the timing of vocabulary insertion and the conflation of adjective and the verbal/predicative functional head. If the vocabulary insertion in both the Pred and A comes to soon, it will bleed the movement of the latter head to the former.

Russian short form adjectives can be derived using the same assumptions on the timing of head movement and spell-out, by simply adding the F$_A$P into the equation. I propose that the SF adjectives in Russian are the outcome of a derivation in which the F$_A$-head first spells out its complement (AP) and then it undergoes head movement to the verbal functional head Pred, yielding an equivalent of a lexical verb (see Martinović 2016 and references therein for discussion on the timing of spell-out and head movement on phase heads). 'Vocabulary insertion' in Baker's terms, or spell-out in my version, does not need to apply to both heads simultaneously, but can instead proceed sequentially.

[101] Baker (2003) assumes that Pred is a phonologically empty head and that the vocabulary item for the copula 'be' is inserted at some higher head, for instance Aux or T.

(300) short-form adjectives in Russian



From this point on the whole structure behaves like a *v*P and the honorific pronoun is merged as its external argument, i.e. its specifier. Since verbs in Russian mostly show formal agreement, this indicates why formal agreement is forced on short form predicate adjectives. I leave open the issue of which verbal head exactly carries out the agreement with the honorific pronoun (whether it is Pred itself or some higher head), what is important is that, due to the strict ordering of Number Agree before other operations in Russian, formal agreement will always be the end result.

As a result, even though they look like adjectives on the surface, SF adjectives are essentially verbal, which is in accordance with the previous literature (Babby 1973; Bailyn 1994, 2012; Geist 2010; Borik 2014). Moreover, the movement of the F_A head to the predicative head models the lack of the additional morphology of SF adjectives with respect to LFs (this head does not carry out Agree as in all other cases above, but it is present within a complex head). Furthermore, if the subject is merged as an external argument in these structures, nothing prevents a potential internal argument of the adjective to be realised (cf. the observation (296) above by Borik 2014:141). Such structures also cannot function as nominal modifiers since they are essentially verbal categories and therefore cannot merge as adjuncts to *n*Ps. Finally, SF adjectives have the same selectional restrictions like their cognate verbs (LF adjectives show no such restrictions).

(301) a. Rebenok bolen.
child sick.SF
'The child is sick.'

b. *Golos u nego bolen.
voice by him sick.SF
'His voice is sick.'

(302) a. Rebenok boleet.
child be.sick.PRES.3.SG
'The child is sick.'

b. *Golos u nego bolen.
voice by him be.sick.PRES.3.SG
'His voice is sick.'

In sum, the derivation of Russian SF adjectives is a result of an opaque interplay between the timing of head movement and spell out on phase heads. Treating the SF adjectives as an essentially derived verbal category has the benefit of accounting not only for their agreement patterns, but also for their distributional and selectional restrictions.

Chapter 7

Parametric variation and consequences for regular pronouns

7.1 Parametric variation in predicate agreement

In the previous chapter, we have explored the aptness of our agreement system to handle the possibilities of semantic and formal agreement on various types of predicates. In this section, I will discuss the factors responsible for deriving the variation between different languages from our sample, i.e. what allows or even forces a particular type of agreement on the given predicate in the given language.

The summary of the patterns I have tackled is repeated in the Table 5.2 below. The languages in the table are classified according to the placement of the cut-off point between the formal and semantic agreement and the possibilities for allowing optionality in agreement. The first group is occupied by the languages that uniformly show semantic agreement on targets other than the finite verb. Group 2 comprises languages whose participles agree in formal plural number, while the predicate adjectives show semantic agreement. The final group is represented by all the languages where optionality in agreement obtains on the participle and/or the adjective.

Group 1	finite verb ||	participle	adjective	noun
French	PL	SG	SG	SG
Romanian	PL	SG/(PL?)	SG	SG
Italian dialects	PL	SG	SG	SG
Modern Greek	PL	SG	SG	SG
Czech	PL	SG	SG	SG
Group 1a	**finite verb**	**participle**	**adjective ||**	**noun**
?	PL	PL	PL	SG
Group 2	**finite verb**	**participle ||**	**adjective**	**noun**
Ukrainian	PL	PL	SG	SG
Belorussian	PL	PL	SG	SG
Russian	PL	PL	short form PL 97%	SG
			long form SG 89%	SG
Slovak	PL	PL	SG	SG
Group 3	**finite verb**	**participle**	**adjective**	**|| noun**
Icelandic	PL	n.a.	PL / SG	n.a.
Lower Sorbian	PL	PL	PL / SG	SG
Macedonian	PL	PL	(PL) / SG	SG
Bulgarian	PL	PL / SG	SG	SG
Upper Sorbian	PL	(PL) / SG	(PL) / SG	SG
Polish dialects	PL	PL / SG	PL / SG	SG
BCS	PL	PL / (SG)	PL / (SG)	SG
Slovenian	PL	PL / (SG)	PL / (SG)	SG

Table 7.1: Predicate Hierarchy effects

What all the languages have in common is the plural (i.e. formal) agreement on the finite verb and the singular (i.e. semantic) agreement on the predicate noun. In order to account for the former, in Section 6.3 I have proposed that the finite verb always carries out number agreement before person agreement. As a consequence, the number feature of T will be valued either by the Num head or by the D head in case this head has previously copied the plural number feature (as in (230) above). Singular agreement has been ruled out by the Condition on Full Valuation (37), which disallowed copying the singular number from D, even when it is the closer potential goal, since the gender feature connected in its geometry does not fit the 'container' of unvalued features present on T. As for the latter, we have seen evidence that what we are encountered with is not syntactic agreement at all, but rather the result of a pragmatic filter on predicative structures. Therefore, the order of operations does not play a role on the predicate noun, simply because no (ϕ-)Agree operations are performed between the two, as the noun has its own ϕ-feature set with predetermined values.

When it comes to the other agreement targets, Table 7.1 indicates that the type of agreement they show enables organising the languages from our sample into 4 groups. Section 7.1.1 will address the groups with uniform ordering of operations, i.e. Group 1 and the combinatorially

possible Group 1a. Languages with a split between the participle and the predicate adjective are tackled briefly in Section 7.1.2, while Section 7.1.3 explores the consequence of free ordering of Agree operations throughout the grammar of languages in Group 4.

7.1.1 Uniform ordering in the grammar – Group 1

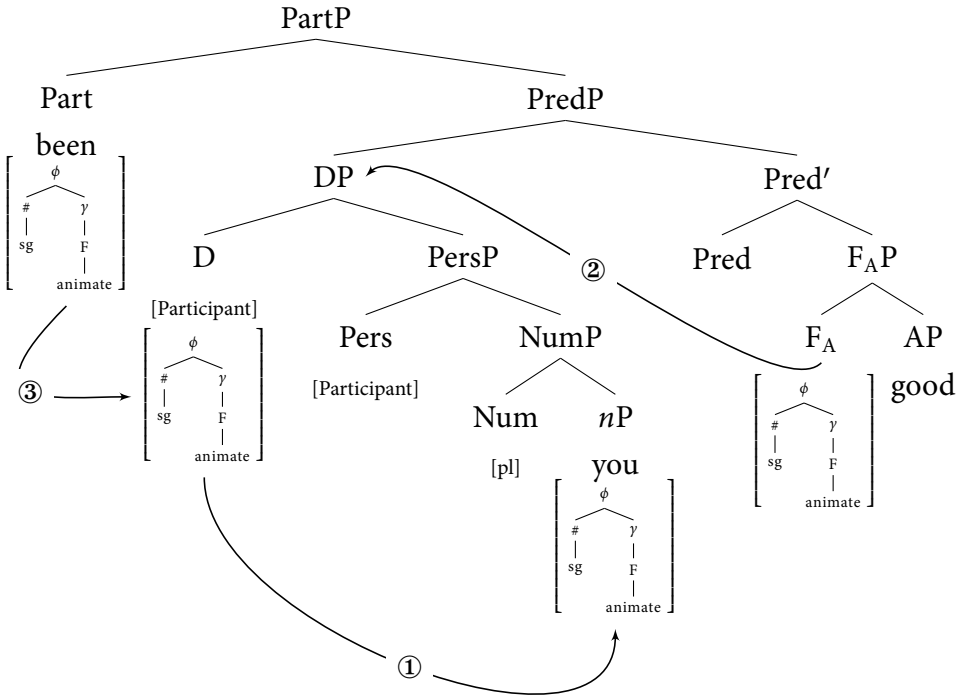
Based on the insights provided by the previous chapter, Group 1 seems to be the most straightforward to analyze. Languages that comprise Group 1 uniformly require semantic agreement on all their targets. Under my analysis, this corresponds to saying that in these languages gender agreement is always given priority with respect to number agreement across all the possible targets in the language. Thus, if Gender Agree precedes Number Agree on D, the natural gender and number features will be copied by D and available there for the external probes. From there, they will be copied by the participle, as well as by the predicate adjective. In principle, as long as D has copied the natural gender and number, the order of operations and the configuration that the predicative adjective is merged in do not play a crucial role. But for the sake of uniformity, and in the lack of evidence to the contrary, I treat these languages as having Gender Agree preceding Number Agree across the board.

On the concrete example of Czech, repeated in (303), the derivation of a sentence that contains both a past participle and a predicate adjective would look like the one in (304). Abstracting away from the issue of whether the *v*P is projected between the PredP and the PartP and whether the subject DP moves to the specifiers of different verbal projections on its way to the clause-initial position, I will illustrate the pronoun as appearing in the position where it is base-merged.[102] As illustrated in (304), after D has copied the semantic gender and number, all other external probes will find these features as the closest ones.

[102] See Veselovská (2008); Geist (2010); Borik (2014) for more elaborate structures of the verbal domain in Czech, and Adger (2003); Wurmbrand (2012) for agreement operations that might possibly obtain between the heads of verbal projections.

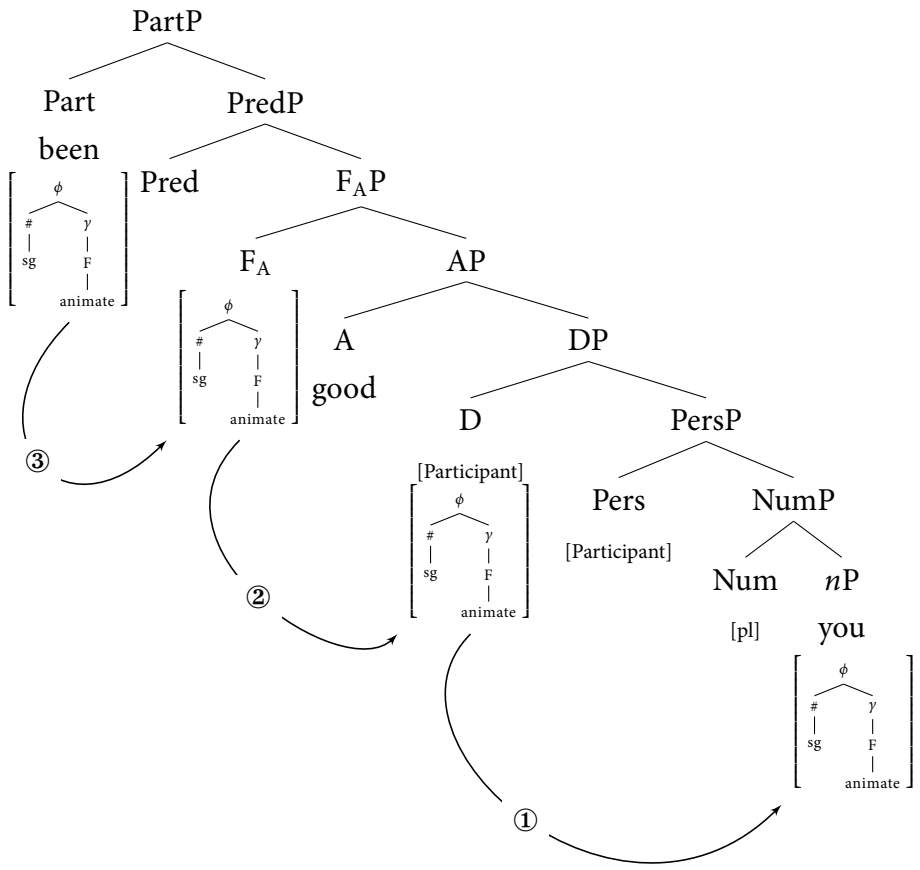
(303) Vy jste byla dobrá.
you aux.2.pl been.f.sg good.f.sg
'You (female addressee) were good.' [Czech] (Comrie 1975:408)

(304) Group 1 languages:
① Gender Agree > Number Agree on D
② Gender Agree > Number Agree on F_A
③ Gender Agree > Number Agree on Part



The situation should be the same with unaccusative adjectives. Since the DP carries the natural gender and number features, the F_A will only be able to copy these features from the honorific pronoun.

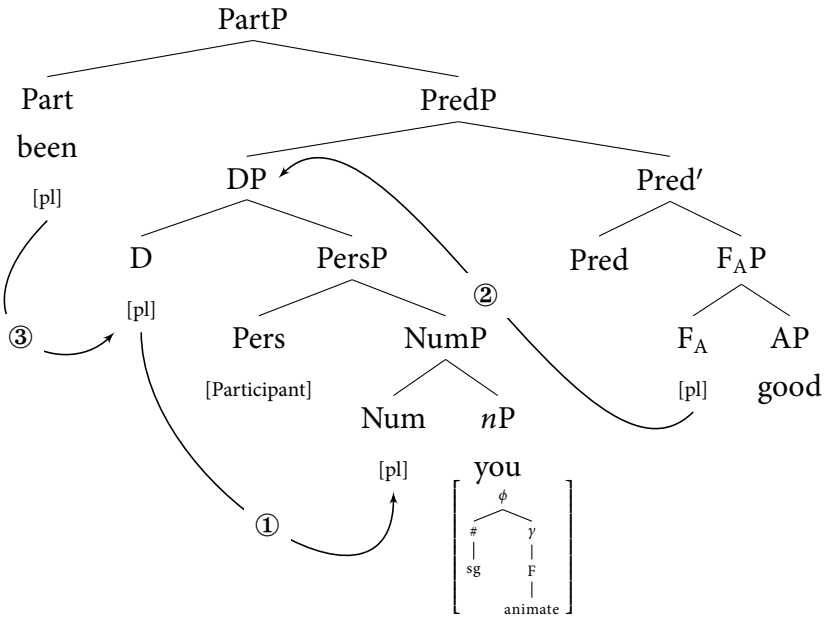
(305) Group 1 languages:
① Gender Agree > Number Agree on D
② Gender Agree > Number Agree on F_A
③ Gender Agree > Number Agree on Part



As mentioned above, the system in principle allows for the existence of a language in which Number Agree would be given primacy in its grammar across the board. Even though I leave the empirical confirmation of this pattern to future research, below I sketch what the grammar of such a language should look like. Recall from Table 6.4 above that the only way to have formal plural number agreement on the Part head was to bleed Gender Agree early enough, both on the D head and on the Part head. In order to do that, Gender Agree must apply late enough, after Number Agree has created a domain within which Gender Agree must operate, but within which it will be unsuccessful at finding any gender values. Moreover, recall that if D has copied grammatical plural number from Num, this is the only feature that will be available to the predicate adjective, assuming that F_A probes upwards. Even if F_A probes downwards in the unaccusative configuration, the fact that the adjective always shows plural agreement

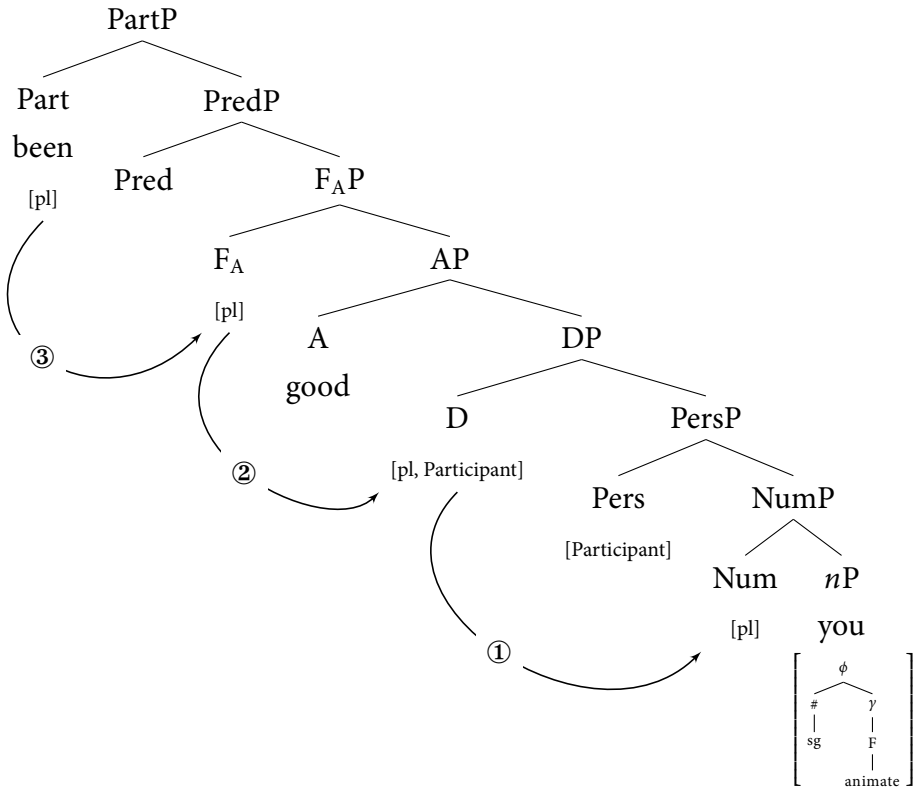
suggests that Number Agree is the first one to apply in this case as well.
Thus in the canonical predication structure, where the honorific pronoun is merged as the specifier of the PredP, the result is formal plural agreement and failed gender agreement throughout the derivation, as sketched in (306).

(306) Group 1a languages:
① Number Agree > Gender Agree on D
② Number Agree > Gender Agree on F_A
③ Number Agree > Gender Agree on Part



The same should hold for unaccusative adjectives. Even though the natural gender should in principle be visible to the F_A head that c-commands it, natural gender and number agreement will never be derived if Gender Agree applies late.

(307) Group 1a languages:
① Number Agree > Gender Agree on D
② Number Agree > Gender Agree on F_A
③ Number Agree > Gender Agree on Part



To sum up, Table 7.2 presents the ordering of Agree operations on the relevant agreement targets in the languages in groups 1 and 1a (henceforth, γ-Agree will stand for 'Gender Agree', while #-Agree will stand for 'Number Agree'). What the two groups have in common is the fact that the order of operations is fixed on all the targets in the languages. What makes them different is that the Group 1 gives primacy to Gender Agree (i.e. semantic agreement), while Group 1a lets Number Agree value its formal features first.

	D	Part	F_A	
			regular	unaccusative
Group 1	γ-Agree > #-Agree	γ-Agree > #-Agree	γ-Agree > #-Agree	γ-Agree > #-Agree
Group 1a	#-Agree > γ-Agree	#-Agree > γ-Agree	#-Agree > γ-Agree	#-Agree > γ-Agree

Table 7.2: Uniform ordering languages

7.1.2 A split between the targets – Group 2

When it comes to Group 2, the situation seems to be slightly more complex. This group is mostly occupied by East Slavic languages - Ukrainian, Belorussian and Russian, but it also includes Slovak. The categorical split between the formal participial agreement and the semantic adjectival agreement suggests that the two types of predicate might favour different orderings of operations. The adjective seems to give advantage to Gender Agree, while the participle prefers to release the number probe as the initial one.

What seems to pose a challenge in this scenario on the one hand is the fact that constant semantic agreement on the predicate adjective implies that the DP must consistently project semantic gender that the adjective's F_A head can copy (assuming that the subject is in Spec-PredP). On the other hand, having semantic features on D would rule out formal agreement on the participle (as seen in Czech above), contrary to fact. It seems that the East Slavic data pose a paradox to the system developed so far.

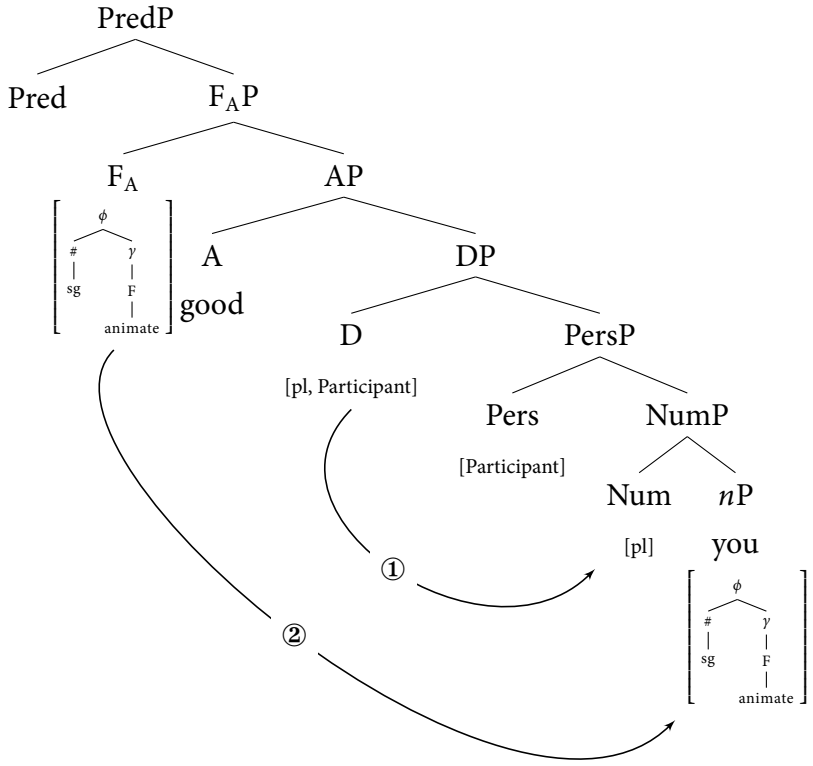
Fortunately, Russian seems to provide a window to understanding agreement in the East Slavic family. As discussed in Section 6.8, Russian offers overt morphological evidence, as well as syntactic evidence for two possible configurations in which predicate adjectives can be found. I have argued that the long-form adjectives, those that systematically require semantic agreement, have unaccusative properties. They directly select their NP/DP complement, with which their F_A agrees in a downward fashion (295). The NP/DP complement subsequently moves to the sentence-initial position. Unlike them, the short-form adjectives incorporate into the copula and from that point on they agree just like verbs do (300).[103]

This line of thinking can be extended to the rest of the languages in the same group. I hypothesise that in Ukrainian, Belorussian and Slovak the D always performs Number Agree first, which bleeds Gender Agree due to the CAD and causes D to copy only the formal plural number. Furthermore, the Part performs its Agree operations in the same order. This ensures that the participle is always plural in number, while gender agreement fails. As for the predicate adjectives, if they are unaccusative (and directly select the honorific pronoun as their complement), the preferred order of operations is Gender Agree > Number Agree. However, if the adjective is merged as a complement to the PredP, it will undergo incorporation to the Pred head and continue probing like a verb, which in turn means that semantic agreement would not be available to it.

A potential derivation for a sentence that contains both the predicate adjective and a participle in Group 2 is presented in (308) and (309). At first, the D agrees in formal plural number, while the F_A performs Number Agree first, thereby copying the semantic features.

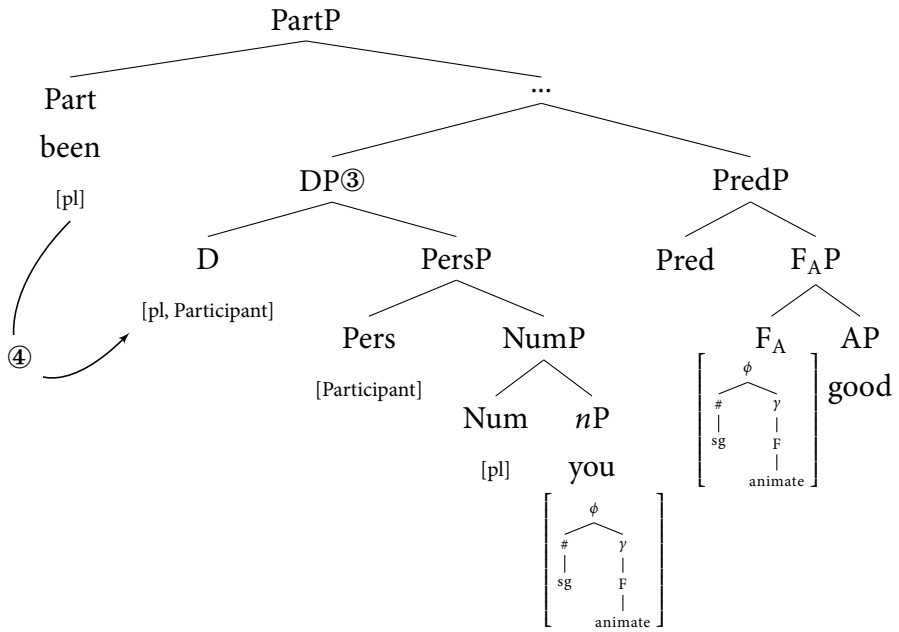
[103] Specifically, it was argued that the adjective head-moves to the Pred head after its phonological content has been spelled out. This way, what looks like an adjective on the surface actually behaves like a verb for the purposes of the further syntactic derivation.

(308) Group 2 languages:
① Number Agree > Gender Agree on D,
② Gender Agree > Number Agree on F_A



Afterwards, the honorific pronoun moves to the edge of the current phase in order to be able to undergo further movement to the Spec-TP, i.e. to the sentence initial position. I will remain agnostic towards the landing site of this movement as it is irrelevant for current purposes. Upon merging the Part head, which gives primacy to Number Agree, the participle's number feature will be valued by D's plural number, while Gender Agree will fail due to the CAD.

(309) Group 2 languages:
③ Move DP
④ Number Agree > Gender Agree on Part



Such an approach to agreement in Group 2 makes two predictions that the future empirical research should be able to test. (i) It must be assumed that predicate adjective in these languages appears only in the unaccusative configuration. If the adjective starts out as the complement of the Pred head, it will incorporate into this head and continue behaving like a verb. (ii) The Part has to agree directly with the subject pronoun and not with the F_AP, otherwise it will always copy the semantic gender from the F_AP. This means that the subject DP has to move above the F_AP before Part agrees with it.

To summarise, Table 7.3 presents the orderings of Agree operations on different targets in Group 2. The tentative analysis developed here leaves open two interesting points for future research in East Slavic. First, it is necessary to test empirically whether predicate adjectives in Belorussian, Ukrainian and Slovak show the same syntactic properties as the long-form adjectives in Russian as well as to explore deadjectival participles in support of the hypothesis of incorporation of adjectives into Pred. The second point would be to test how agreement interacts with movement to the sentence initial position in order to establish the exact configuration in which the Part targets the subject DP.

	D	Part	F_A	
			regular	unaccusative
Group 2	#-Agree > γ-Agree	#-Agree > γ-Agree	move to Pred	γ-Agree > #-Agree

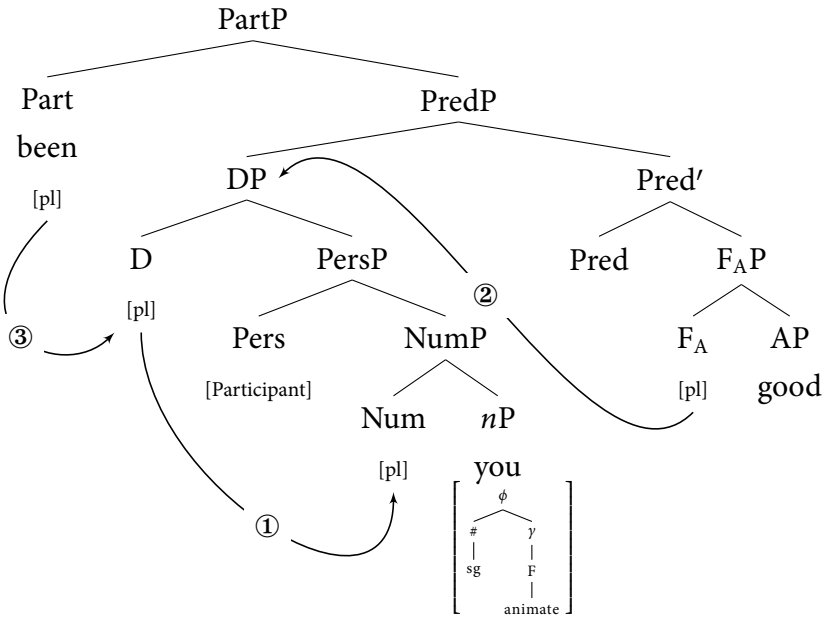
Table 7.3: Cut-off point between Part and F_A

7.1.3 Grammar-wide free ordering – Group 3

Looking at the languages in Group 3, judging by the optionality between formal and semantic agreement on the participle and the predicate adjective, it seems that the D, Part and F_A allow for both orders of operations. This seems to be especially true for Upper Sorbian, BCS and Slovenian. As for Icelandic, definite claims can be made only for the adjective, which seems to allow alternations in ordering of Agree as well. The lack of restrictions on the adjective additionally suggests that the subject honorific pronoun may merge either in the Spec-PredP position, or as a complement to A, and in both structures the order of Agree at the F_A can be underspecified.

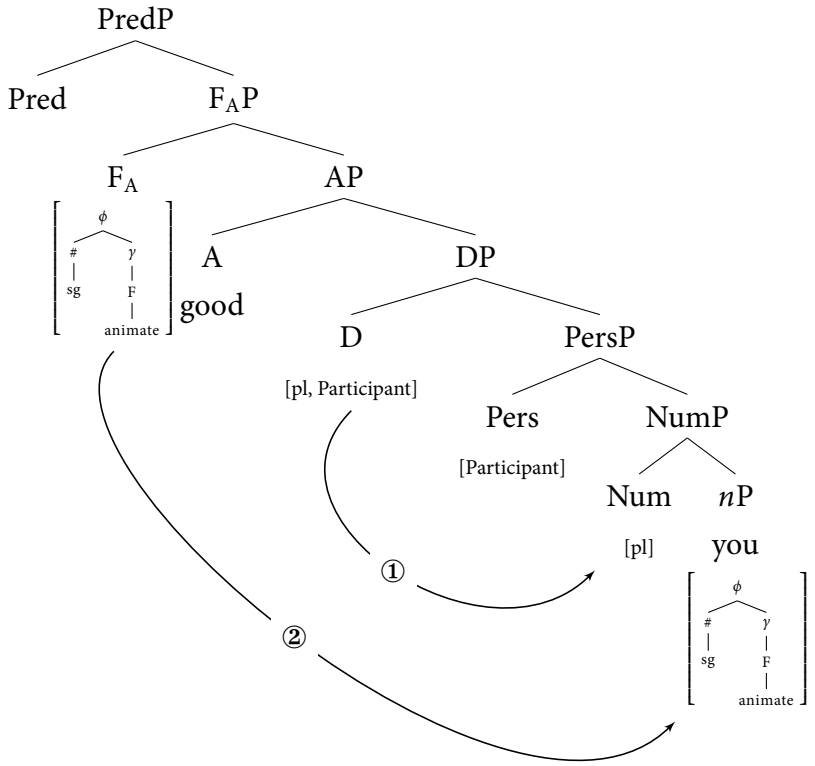
On the other hand, Lower Sorbian and Macedonian plural agreement on the participle suggests that their D agrees in number first, after which Part repeats the same order of operations. Yet, mixed agreement on the adjective suggests that the F_A can still somehow reach the singular number and natural gender of the honorific pronoun. In order to account for the variation, I assume that the order of operations on the F_A is underspecified. This has two consequences. If the honorific pronoun is merged as the specifier of the PredP, and it carries the [#:pl] number feature, this is the only value that the F_A will be able to copy from D. Consequently, the adjective will always be valued with plural number and default gender, as illustrated in (310).

(310) Macedonian and Lower Sorbian:
① Number Agree > Gender Agree on D
② any order on F_A
③ Number Agree > Gender Agree on Part



However, if the A directly selects for the honorific pronoun, the free order of Agree on the F_A head can make a difference. All things being equal, we can derive the natural gender and number agreement by giving advantage to Gender Agree on F_A, as in (311).

(311) Macedonian and Lower Sorbian:
① Number Agree > Gender Agree on D,
② Gender Agree > Number Agree on F_A



If the Part head merges above the PredP, as in (309) above, the derivation will have to involve the additional step of movement of the subject DP to the phase edge, on its way to the subject position, where the Part head will be able to reach it and agree in the formal plural feature.
An additional curious point about Macedonian is that, even though the active participle refuses to agree in semantic features, semantic agreement on the passive participle sounds much more acceptable to native speakers. As (312) shows, both agreement options seem to be tolerated in this case:

(312) a. Vie ste izabrani za pretsedatelka.
you.2.PL aux.2.PL chosen.PL for president
'You (feminine addressee) were chosen as a president.'

b. ?Vie ste izabrana za pretsedatelka.
you.2.PL aux.2.PL chosen.F.SG for president
'You (feminine addressee) were chosen as a president.'

The examples above point to a potential inherent connection between the possibility of hav-

ing an internal argument and showing semantic agreement. I leave it for future research to determine the extent of this connection by looking more closely into the connection between predicate adjectives and passive participles in terms of their syntactic, morphological and agreement properties.

Finally, Bulgarian seems to pose an interesting puzzle – while the constant semantic agreement on the adjective suggests the necessity of semantic gender agreement on D, the optionality on the participle indicates either alternations or preference for formal agreement on D. In order to resolve it, I will keep the assumption that the order of operations is underspecified on D in this language, as well as that the Part head can probe for its features in any order. But in order to account for the constant semantic agreement on the predicate adjective, I will assume that, just like languages in Group 2, Bulgarian prefers to merge its subject as a complement to the predicate adjective. This predicate adjective then always performs Gender Agree first, thus always yielding semantic agreement. As in Macedonian above, the preference for semantic agreement with the internal argument is supported by agreement on the passive participle. Unlike in Macedonian, where semantic agreement on the passive participle is marginally possible, in Bulgarian it is in fact obligatory:

(313) Vie ste predstavena za nagrada.
you.2.PL aux.2.PL presented.F.SG for prize
'You are presented for the prize.'

The obligatoriness of semantic agreement with the internal argument of both the passive participle and the predicate adjective suggests once again that there is a connection between the configuration in which the subject and the predicate adjective are found and the type of agreement that will eventually obtain. This connection will be a matter of future research.

To summarise, languages with varying agreement orders discussed in this section are outlined in Table 7.4 below.

	D	Part	F_A	
			regular	unaccusative
Macedonian Lower Sorbian	#-Agree > γ-Agree	#-Agree > γ-Agree	both	both
Bulgarian	both	both	?	γ-Agree > #-Agree
BCS, Upper Sorbian, Polish, Slovenian	both	both	both	both

Table 7.4: Optional orders at Part and F_A

7.1.4 Monotonicity in the Predicate Hierarchy

Languages that optionally allow either semantic or formal agreement on the participle and the predicate adjective reveal the final curious property of the Predicate Hierarchy. Just like the Agreement Hierarchy, the Predicate Hierarchy also imposes restrictions in agreement on different types of targets that it is comprised of. Comrie (1975) observes that in languages which allow variation between semantic and formal agreement on the adjective and the participle (Slovenian from Group 3), if the two co-occur, there are four possible combinations we can expect, as illustrated abstractly in (314). Of the four possible combinations, the final one (314d), where the participle agrees in natural gender and singular number, while the adjective agrees in formal plural number, is disallowed.

(314)
a. Pronoun ... Participle$_{pl}$ ... Adjective$_{pl}$ ✓ both formal
b. Pronoun ... Participle$_{sg}$ ... Adjective$_{sg}$ ✓ both semantic
c. Pronoun ... Participle$_{pl}$ ... Adjective$_{sg}$ ✓ formal – semantic
d. *Pronoun ... Participle$_{sg}$ ... Adjective$_{pl}$ ✘ semantic – formal

Corbett (1983:49-50) illustrates this situation with an example from Slovenian:

(315) *Agreement restrictions* (Corbett 1983:49f.)

a. Vi ste bili dobri.
you.2.PL aux.2.PL been.M.PL good.M.PL
'You were good.' PART:PL – ADJ:PL ✓ both formal

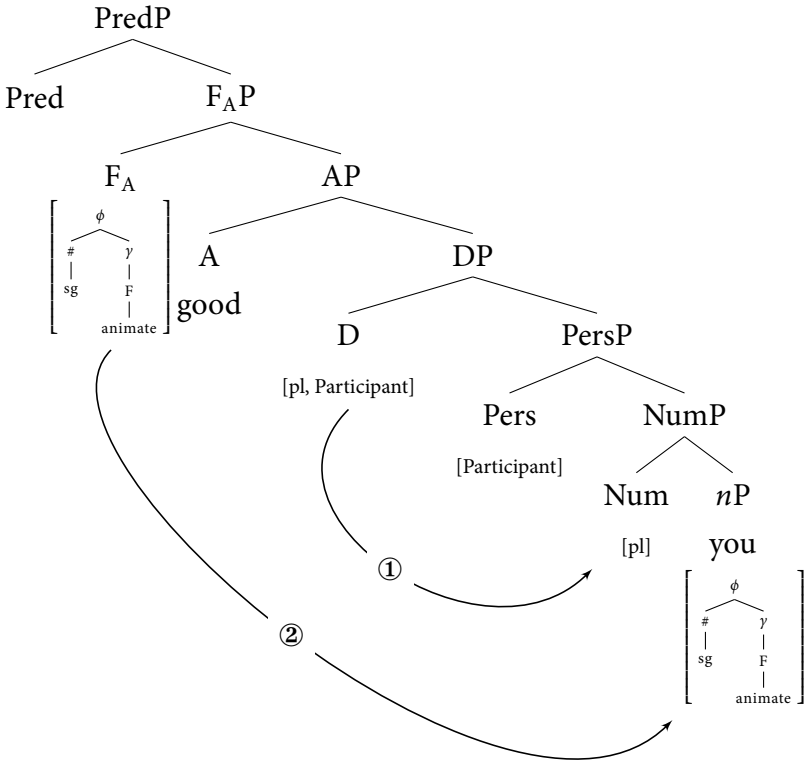
b. Vi ste bila dobra.
you.2.PL aux.2.PL been.F.SG good.F.SG
'You were good.' PART:SG – ADJ:SG ✓ both semantic

c. ?Vi ste bili dobra.
you.2.PL aux.2.PL been.M.PL good.F.SG
'You were good.'? PART:PL – ADJ:SG ✓ formal–semantic

d. *Vi ste bila dobri.
you.2.PL aux.2.PL been.F.SG good.M.PL
'You were good.' *PART:SG – ADJ:SG ✘ semantic–formal

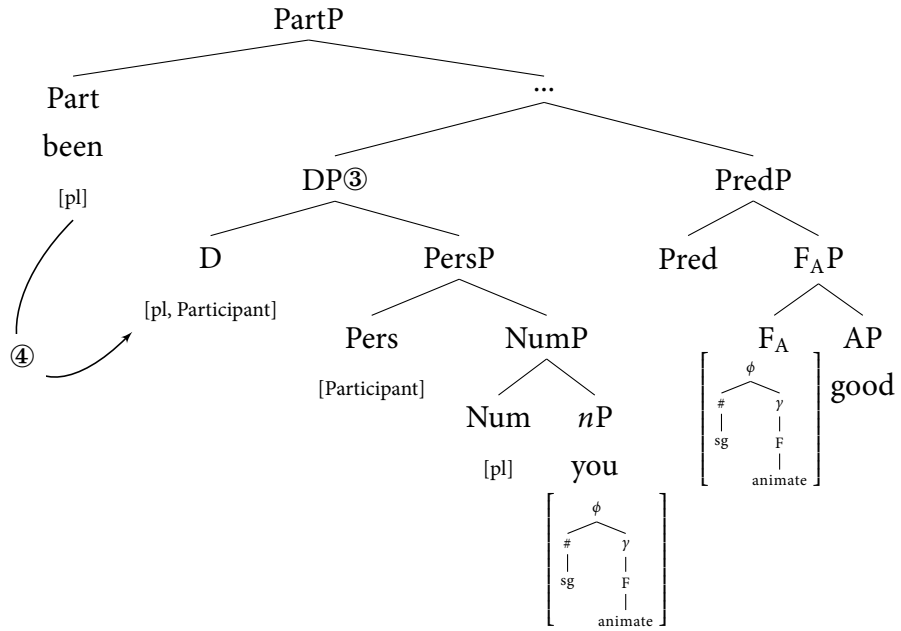
In other words, the possible mismatch in (315c) is actually the equivalent of the regular pattern of Group 2 described in Section 7.1.2 above, and carried over to Macedonian and Lower Sorbian. Recall that the way to get the adjective to agree in semantic features and the participle in formal ones was to bleed Gender Agree on D, but make it the first operation on (the unaccusative) F_A, as in (316).

(316) Possible mismatch:
① Number Agree > Gender Agree on D,
② Gender Agree > Number Agree on F_A



Afterwards, the subject DP was assumed to move closer to Part, which then agrees with it in the formal plural feature:

(317) Possible mismatch:
③ Move DP
④ Number Agree > Gender Agree on Part



As a result, the adjective is valued by the singular number and natural gender feature, while the Part copies the plural number, yielding a mismatch that respects the Predicate Hierarchy restrictions in agreement. This could allow us to tentatively generalise that the F_A of unaccusative adjectives actually always performs Gender Agree first in the languages under survey. I leave the testing of this generalisation to future research.

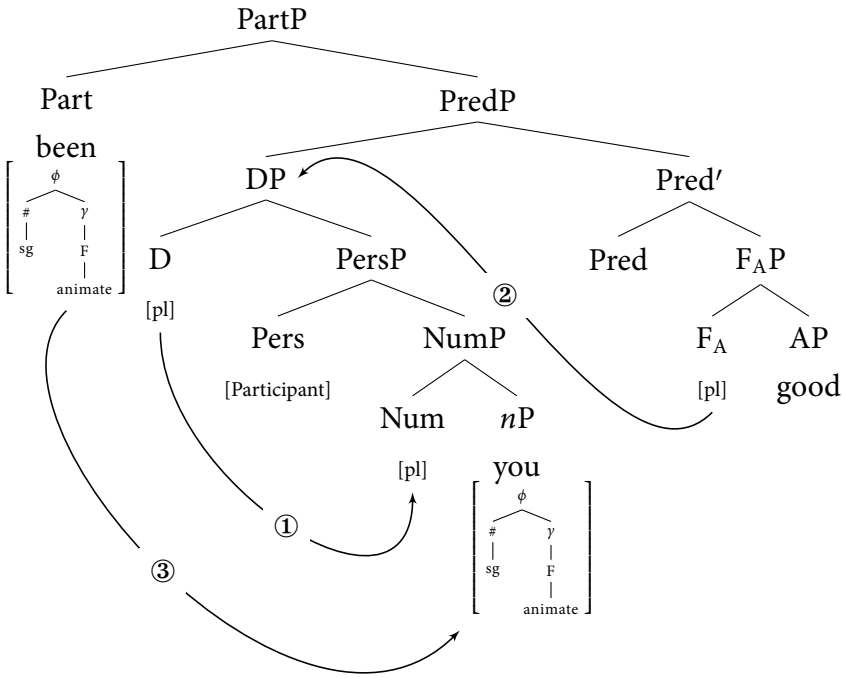
As a final note, examples in (315) above suggest that what needs to be ruled out is the situation in which the D has copied the formal plural number, after which the predicate adjective has taken over this value, while Part can still reach the natural gender and singular number of the pronoun by letting Gender Agree apply first:

(318) *Agreement restrictions:

① Number Agree > Gender Agree on D

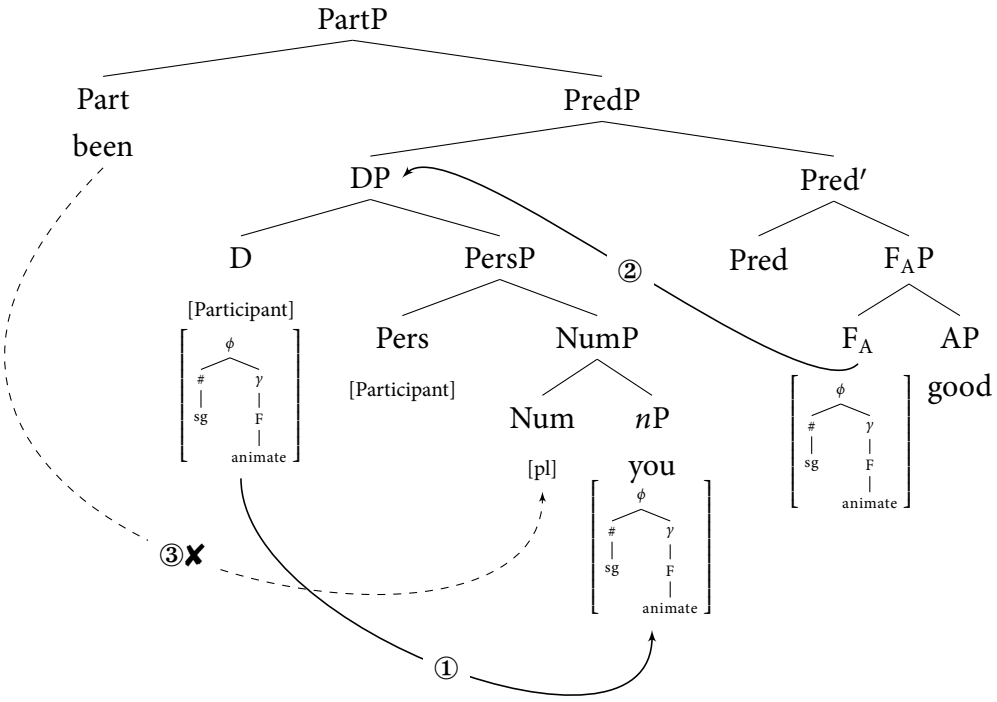
② Number Agree > Gender Agree on F_A

③ Gender Agree > Number Agree on Part



Additionally, the possible and tolerated mismatch would require a derivation where the D has copied the semantic gender, which will serve as a source of valuation for the predicate adjective. However, in this case, the semantic gender should be the only possible value available for the Part as well. Part thus should not be able to reach the formal plural number on the Num head under any circumstances, as illustrated in (319).

(319) *Agreement restrictions
① Gender Agree > Number Agree on D
② Gender Agree > Number Agree on F_A
③ any order on Part



Derivations in (318) and (319) indicate that what must be ruled out in the mismatching cases does not seem to be the type of agreement allowed on different predicates, but rather the type of configuration they appear in. What the two structures above have in common is that the honorific pronoun is merged as the specifier of the PredP. It seems that in this configuration mismatches are not allowed. I assume therefore that the cause of the differences between languages reported here may be an underlyingly different syntax. I leave it to future research to fully grasp this intricate interplay between the type of the structure that the adjective and the subject DP find themselves in and the type of agreement that comes out as a product of this structure and the possible orderings of Agree operations on different targets.

7.1.5 Interim summary

Putting together the results presented in Tables 7.2–7.4, Table 7.5 below presents an overview of the possible orderings of Gender Agree and Number Agree operations on D, Part and F_A in all the languages discussed thus far. For the purposes of a general discussion, I omit Bulgarian, Macedonian and Lower Sorbian, and direct the interested reader to Section 7.1.3 for further detail.

	D	Part	F_A	
			regular	unaccusative
Group 1	γ-Agree > #-Agree	γ-Agree > #-Agree	γ-Agree > #-Agree	γ-Agree > #-Agree
Group 1a	#-Agree > γ-Agree	#-Agree > γ-Agree	#-Agree > γ-Agree	#-Agree > γ-Agree
Group 2	#-Agree > γ-Agree	#-Agree > γ-Agree	move to Pred	γ-Agree > #-Agree
Group 4	both	both	both	both

Table 7.5: Orderings of Agree for different groups

Judging by the table above, languages can choose to maintain one order of operations throughout, or perhaps to vary the order of Agree operations depending on the type of the probe. What is important is that if D has copied semantic features, this will determine the type of agreement shown by all subsequent targets (as in Group 1). If D has copied only the formal features (Group 2 and 3), semantic features should still in principle be visible for other probes. Therefore, the Predicate Hierarchy seems to be a conspiracy of the order of operations performed on the D head and their effect on other agreement targets that interact with the given D. In this sense, the Predicate Hierarchy is similar to Agreement Hierarchy. However, what makes the two different is that the elements that make up the Predicate Hierarchy do not seem to interact with each other as much as the elements in the Agreement Hierarchy do.

7.2 Agreement with regular pronouns

We have seen thus far that our system derives the possible attested agreement options with the honorific pronoun as the subject. This section aims to provide a short illustration of the way that agreement patterns of regular pronouns come out trivially as a result of the system. We will start by looking into agreement on the participle with the singular and plural local person pronouns, basing the examination on the examples from BCS.

Both in the singular and in the plural, local person pronouns trigger agreement in the natural gender and number of their referents:

(320) a. Ja sam došla.
I.1.SG aux.1.SG came.F.SG
'I (female referent) came.'

b. Ti si došao.
you.2.SG aux.2.SG came.M.SG
'You (male referent) came.'

c. Mi smo došle.
we.2.PL aux.1.PL came.F.PL
'We (female referents) came.'

d. Vi ste došli.
you.2.PL aux.2.PL came.M.PL
'You (male referents) came.'

According to my proposal, a singular local person pronoun should have natural gender and singular number encoded on the *n* head and either [π:Participant] or [π:Participant [Speaker]] specified on their PersP, signalling the second or the first person. Since I have treated formal, i.e. grammatical singular as the lack of number on DPs in BCS, NumP should not be projected in this situation. However, the semantic singular number can be encoded on *n*, not giving rise to any changes in the pronoun's morphology, but having a possibility to influence its agreement patterns. Let us take the sentence in (321) for the purposes of illustration. The PersP of a first person pronoun should be specified as [π:Participant [Speaker]], while its *n*P should encode [γ:F[anim], #:sg] as it denotes a single feminine speaker.

(321) Ja sam došla.
I.1.SG aux.1.SG came.F.SG
'I (female referent) came.'

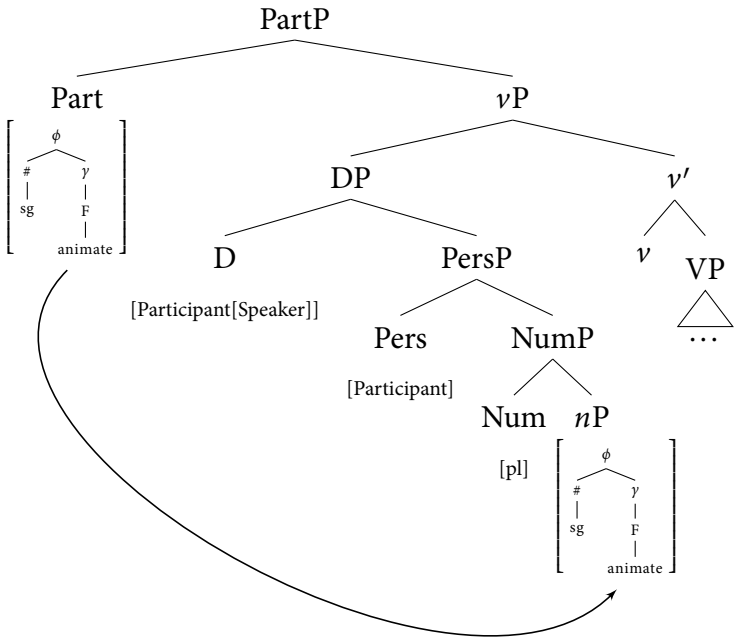
Starting from the D level, the possible orderings of Gender, Number and Person Agree operations will yield the patterns in (322). Copying gender features first (322a-b) will pied-pipe the natural singular number. Conversely, applying Number Agree first and matching the singular number of the *n* head, the natural gender will have to be copied together with it (322c-d). If Person Agree is given the advantage, the person features will be the only ones D will copy (but the semantic features will still remain visible on *n*).

(322) a. Gen Agree > Num Agree > Pers Agree ⇒ [γ:F, anim, #:sg, π:Participant, Speaker]
b. Gen Agree > Pers Agree > Num Agree ⇒ [γ:F, anim, #:sg, π:Participant, Speaker]
c. Num Agree > Gen Agree > Pers Agree ⇒ [γ:F, anim, #:sg, π:Participant, Speaker]
d. Num Agree > Pers Agree > Gen Agree ⇒ [γ:F, anim, #:sg, π:Participant, Speaker]
e. Pers Agree > Gen Agree > Num Agree ⇒ [γ:∅, #:∅, π:Participant, Speaker]
f. Pers Agree > Num Agree > Gen Agree ⇒ [γ:∅, #:∅, π:Participant, Speaker]

Since the Part only searches for gender and number, regardless of the ordering of Agree, it will always be forced to copy the semantic features of the DP if D has previously copied them (322a-d). But when D contains only the person value, as in (322e-f), Part will have to search a bit deeper, past the D head, to the *n*, where it will find the gender and number values it needs (323). Whatever order of operations applies on it, Part will always match one of the feature

values (either the gender or the number) on *n*, and copying this feature will entail copying the entire snippet of the geometry present on the goal.

(323) Part agreement with local person pronouns
Gender Agree > Number Agree: Match [*γ*:F[anim]] + Copy [#:sg]
Number Agree > Gender Agree: Match [#:sg] + Copy [*γ*:F[anim]]



As a result, however D choses to order its operations, as long as there is no formal number feature to trigger CAD effects for natural gender and number agreement, no mismatches or clashes will be generated in agreement with local person pronouns in the singular. Thus semantic agreement, i.e. agreement in natural gender and singular number is the expected and the obtained outcome on the participle. As for the T probe, its Number Agree operation will always fail due to the lack of the formal singular number.[104] The Person Agree will always converge, as it will always be able to find the appropriate goal on the PersP. As for the predicate adjective, just like the Part, it will copy whatever the D has obtained, which will mostly be the natural gender and number features.[105] As a result, a singular local person pronoun will always control semantic gender and number agreement on all the targets that interact with it.

What is curious about plural local person pronouns in the everyday use of BCS speakers, is that the participle can optionally agree in either the semantic features of the pronoun, or in the formal plural number and default masculine gender. For instance, both (324a), with the semantic feminine plural agreement, or (324b), with the formal plural and default (failed) gender agreement can be used if the pronoun refers to an all-female group. This indicates that gender agreement with local person pronouns can actually fail in the plural (just as it could

[104] The semantic singular number from the *n* cannot be copied due to the Condition on Full Valuation (37).

[105] Except in the situations when there is only the person feature on D. These cases, as before, will be left for further research.

with the honorific pronoun).

(324) a. Mi smo došle.
we.2.pl aux.1.pl came.f.pl
'We (female referents) came.'

b. ?Mi smo došli.
we.2.pl aux.1.pl came.m.pl
'We (female referents) came.'

This situation can be modelled straightforwardly in my account, and in fact, it provides further support for it. Under my account, the plural variant of the local person pronoun should differ from the singular in projecting the formal plural [#:pl] feature on the NumP. In parallel with the singular, I assume that another plural feature is encoded on the pronoun's *n* connected to gender in a feature geometry. This plural feature would instantiate a semantic feature, since the pronoun has multiple referents. Thus, just like with the honorific pronoun, two number features are present on a regular local person pronoun, but the difference between the two is that now the values of the number features match.

Let us maintain the first person plural feminine pronoun (324) as a case study. When looking at the order of operations on the D level, the results of the possible orderings will be exactly the same as with the honorific pronoun:

(325) a. Gen Agree > Num Agree > Pers Agree ⇒ [γ:F,anim, #:pl, π:Participant,Speaker]
b. Gen Agree > Pers Agree > Num Agree ⇒ [γ:F,anim, #:pl, π:Participant,Speaker]
c. Num Agree > Gen Agree > Pers Agree ⇒ [γ:∅, #:pl, π:Participant]
d. Num Agree > Pers Agree > Gen Agree ⇒ [γ:∅, #:pl, π:Participant]
e. Per Agree > Gen Agree > Num Agree ⇒ [γ:∅, #:∅, π:Participant]
f. Per Agree > Num Agree > Gen Agree ⇒ [γ:∅, #:∅, π:Participant]

Under the first two orders on D, the Part will be forced to copy the same semantic gender and number the D has copied from *n*, yielding thereby the expected natural gender and number agreement as in (324a) above. The Part will also show semantic agreement with a pronoun whose D has obtained the features shown in (325c-f), under the condition that its Gender Agree operation is given advantage and a free pass to the semantic gender on *n*. With the same orders (325c-f) on D, the remaining option, the default gender and plural number (324b), appears on the Part which gives primacy to Number Agree. In this scenario, as soon as the [#:pl] feature is copied either from D or from the Num head, the lower semantic gender on *n* cannot be reached thanks to the CAD.

The presence of the valued plural number feature indicates that T will trivially show plural agreement, accompanied by the appropriate person value. As for the predicate adjective, it will behave in a similar manner as the Part, copying whatever value D has made available for it, alternating consequently between formal and semantic agreement, as empirically expected. Finally, since third person pronouns project a GenP instead of the PersP, as a direct conse-

quence, they will fail to provide a value for any person probe (either the one on D or on T). This means that person agreement with these pronouns will always be marked by the default 3rd person feature. Regarding gender, the presence of the GenP means that a grammatical gender feature will be a potential target for the relevant probes. Agreement of 3rd person pronouns will thus mirror the agreement of the normal nouns. In the singular, the value from the GenP will be the only goal for Gender Agree of any probe, while Number Agree will fail to find a goal. Similarly, in the plural, GenP and NumP will provide the values for the gender and number probes.

To sum up, this section has demonstrated that the account initially developed to capture the hybrid agreement patterns triggered by honorific pronouns in fact trivially accounts for agreement on regular pronouns. Local person pronouns will always provide values for person features to person probes, and natural gender and number to the respective probes, unless the formal plural number value intervenes. Unlike them, third person pronouns will essentially behave like normal nouns, agreeing in their formal number and grammatical gender, under any order of operations.[106]

[106] Additionally, in case that the third person pronouns denote animate referents, they might also contain natural gender features on their *n*Ps, just like other animate nouns. In this case both the natural and the grammatical gender that the pronoun contains will match in values. The order where the Gender Agree applies first on any probe will lead to natural gender valuation, while applying Number Agree first will yield grammatical gender agreement. Since both gender features have the same value, the surface agreement forms will be indistinguishable in terms of formal vs. semantic marking.

Part IV

Conclusions

Chapter 8

Main results of the dissertation

This dissertation has explored alternations between formal and semantic agreement with hybrid DPs in different languages. The theory that accounts for such alternations was based on the curious behaviour of split-hybrid nouns in BCS, which control agreement with their natural gender in the singular, while in the plural they can control agreement either in their formal or semantic gender features. They differ from other hybrid nouns recorded in the literature in that the possibility of hybrid agreement with one ϕ-feature (i.e. gender) is conditioned by the presence or absence of another ϕ-feature (i.e. number). The theory of agreement developed in this thesis derives the obligatoriness of semantic agreement in the singular and alternations between semantic and formal agreement in the plural by a combination of the following factors: (i) the feature-geometric structure of the phi-features involved in agreement, (ii) the articulated nature of the phi-probe (relativized probing), and (iii) the order of agreement operations. This approach was applied to two case studies. The first of them, analyzed in the second part of the thesis demonstrated that the theory can derive the effects of the Agreement Hierarchy, while the second one, analyzed in Part 3 did the same with the Predicate Hierarchy. The introductory part of the thesis developed a general theory that derives the patterns of agreement with split hybrid nouns in BCS which challenge recent accounts by posing the problem of limiting optionality only to the plural environment. Recent theories would either have to assume that natural gender is optionally introduced on the noun in the plural (which would not straightforwardly extend to BCS since there is evidence that the natural gender is not optional), or that both kinds of gender are present on the noun, but the interpretable (semantic) gender may be optionally made invisible for Agree by feature deactivation (but a possible deactivation only in the plural in BCS does not lend itself to a principled technical implementation).

I begin my account by proposing a structural specification of the DP with respect to ϕ-feature encoding. I have treated number and gender as valued features on DPs, represented on separate projections. *n*P contains natural gender features (if present on a noun) (Kramer 2014), NumP is projected above *n*P and hosts plural number features (Picallo 1991; Bernstein 1993; Borer 2005; Kratzer 2007; Acquaviva 2008; Harbour 2008), while GenP is projected above it

and it encodes grammatical gender. By reversing the position of gender features, my proposal departs from recent approaches (Pesetsky 2013; Landau 2016), whose strict positioning of semantic gender above the grammatical one cannot derive the BCS patterns. However, I argue that having semantic gender (and number) encoded on *n* straightforwardly models the idea that these features are closer to the conceptual properties of the root, while the formal gender and number higher up in the structure participate in defining the noun's inflection.

Using a feature-geometric system has proved useful in modelling the internal structure of ϕ-features. I have proposed that natural and grammatical gender are internally distinguished, with the former being more complex than the latter. Natural gender is a featural composite consisting of values [F/M [anim]] in a hierarchical relationship (cf. Harley and Ritter 2002). Its featural complexity with respect to the grammatical gender consists in its containing an additional animacy specification in the form of a dependent node. Apart from introducing an innovation in modelling gender features and offering a unified account of the structure of all ϕ-features, the structural complexity of gender features has enabled modeling the preferences of the operation Agree with respect to the kind of gender it likes to target (cf. the relativized probing approach by Béjar 2003; Béjar and Řezáč 2009; Georgi 2012, 2013; Nevins 2007, 2011*b*; Preminger 2014).

Furthermore, Agree operations have additional conditions on valuation and locality to obey. Regarding the valuation, it is regulated by the following condition:

(326) *Condition on Full Valuation*: Valuation is successful if and only if

a. the goal entails the features of the probe[107]

b. the full set of the goal's features is copied by the probe.

This condition can be thought of as a version of Chomsky's (2001:15) *Maximise Matching Effects* or Pesetsky's (1989) *Earliness Principle*, the idea behind which is that, if the probe and the goal match, it is not possible to partially value the features of the probe, and conversely, it is impossible to copy only some values of the goal, leaving the others behind. If the probe does not find a single element that contains all the corresponding valued features, Agree cannot result in valuation. The benefit of this approach is that it models the necessity to copy either all the semantic features, or all the formal features in one fell swoop.

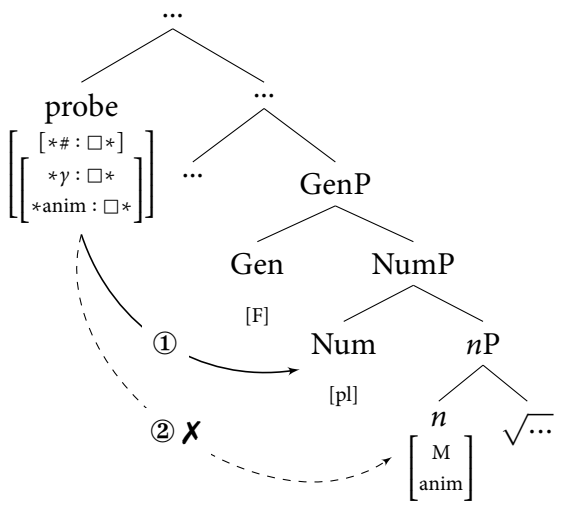
Furthermore, allowing for a free order of Agree operations on a single syntactic head has proved indispensable for deriving all the possible alternations we have encountered in the empirical patterns. One general trend has been that applying Gender Agree before Number Agree tends to yield semantic agreement, while applying Number Agree first will make it less likely that the gender features will be reached by the given probe.

What takes care of the locality of Agree operations has been the Condition on Agree Domains (327). It has ensured that the different Agree operations from a single head operate in strictly defined local domains. As repeated in (328), the CAD produces a derivational opacity effect – if the 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, gender Agree will not be able to target *n*P because number Agree will have rendered all the phrases it c-commands opaque for this probe.

(327) *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.

(328)

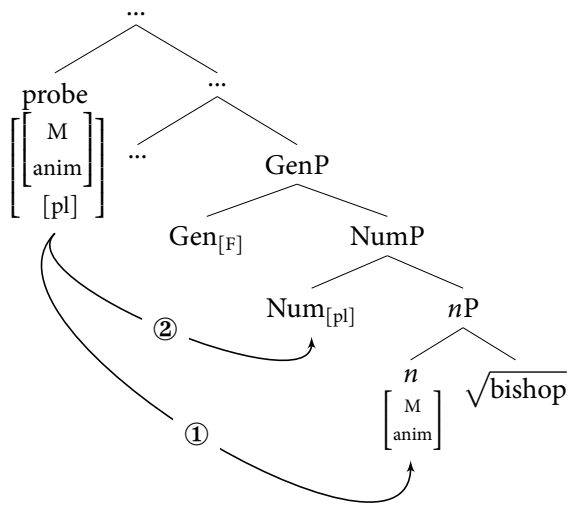


The CAD may produce an effect equivalent to the Phase Impenetrability Condition since it makes the c-command domain of a particular syntactic head opaque for subsequent syntactic operations. By the CAD, however, the domain of the phase only becomes opaque after being affected by a syntactic operation, while the PIC assumes that a certain head is a phase by virtue of a category it bears. Therefore, the CAD is similar to the PIC since it leads to opacity, but in a strictly derivational sense. However, it still differs from the PIC in its dynamics, as the CAD domains can be re-defined with respect to a particular probing head. Therefore, it does not seem that the two are the two side of the same coin and that they can be reduced to the same cause.

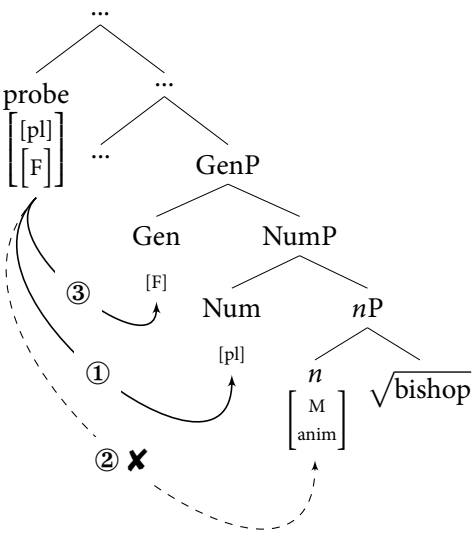
At last, applying the given system on any given probe yields the following results. Performing Gender Agree before Number Agree means that the first probe will reach the more complex and preferred gender feature on *n*. The following operation will copy the number feature from NumP (or, in case of a singular noun, it will fail, leading to default singular valuation) (329). In the case of a reverse order of operations, the Number Agree will copy the features from the NumP, after which the CAD will prohibit Gender Agree from targeting the *n*P. Thus, the gender probe will be valued by the higher grammatical gender of Gen in the second cycle of

Agree (330).

(329) **Natural gender agreement:**



(330) **Grammatical gender agreement**



This basic mechanism of ϕ-agreement illustrates the Relativized Minimality (Rizzi 1990) effects in relativized probing for gender: 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 and since partial valuation of the gender probe is disallowed. If the gender probe has free access to the natural gender in the first derivational step, the more complex, fully matching feature will be targeted even though it is lower in the structure. Thanks to the effects of the CAD, however, this situation is blocked if a higher part of the structure has already participated in agreement. As a result, the mechanism above shows that variation between natural and grammatical gender agreement can be captured through intervention effects by number agreement operations, which can be derived from independent theoretical assumptions, i.e. as a result of a conspiracy of relativized probing, separate probing for number and gender and the Condition on Agree Domains.

The second part of the thesis applies the theory in order to derive the effects of Corbett's Agreement Hierarchy:

(331) *The Agreement Hierarchy*:

ATTRIBUTIVE > PREDICATE > RELATIVE PRONOUN > PERSONAL PRONOUN

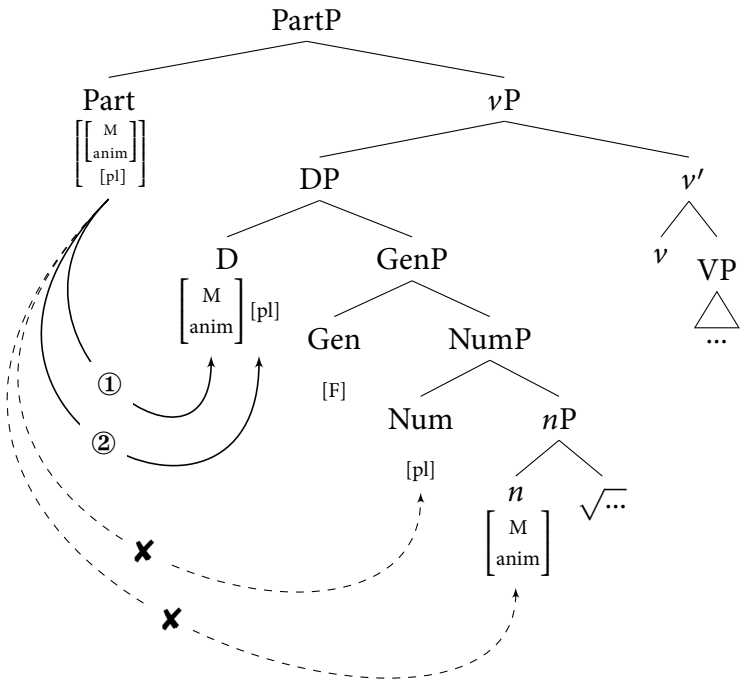
'The possibility of syntactic agreement decreases monotonically from left to right. The further left the element on the hierarchy, the more likely syntactic agreement is to occur, the further right, the more likely semantic agreement (that is, with no intervening decrease).' (Corbett 1979:204, Corbett 2006:207)

Specifically, in case of mismatches between adjectival and verbal agreement, if the adjective shows grammatical gender agreement, the participle can still optionally show either grammatical or natural gender. However, once the adjective shows natural gender agreement, no

'intervening decrease' is allowed (Corbett 1991:226), i.e. natural gender agreement needs to be maintained on all subsequent targets, hence the verb must show natural gender agreement as well.

Based on the fact that nominal modifiers can agree in both formal and semantic features of the noun, I have proposed that they are always merged above all the projections that host ϕ-features (pace Pesetsky 2013; Landau 2016). The key ingredient to deriving the Agreement Hierarchy effects was introduced in Section 3.1.3. I have proposed treating the nominal modifier essentially as both a probe and a goal (in a sequential sense). After a modifier has performed Agree operations as a probe, its unvalued ϕ-features receive certain values which were copied from different goals (*n*/Gen and Num). These values can then be found on and copied from the modifier by higher probes. What this means in practice, for instance, is that once the Adj has agreed with, and copied, a natural gender feature, any higher probe, including D and the participial probe, looking for natural gender should be able to find this feature already on this (closest) Adj, and it will not have to continue the search all the way down to the *n*. More importantly, once the natural gender feature has been projected higher up in the structure than its original *n*P position, targeting the grammatical gender on the GenP becomes impossible, as the higher gender will always be the directly available one. This is how grammatical gender agreement is ruled out on the participle, which derives the Agreement Restrictions, essentially under any order of operations.

(332) **Agreement Hierarchy effects between two slots**

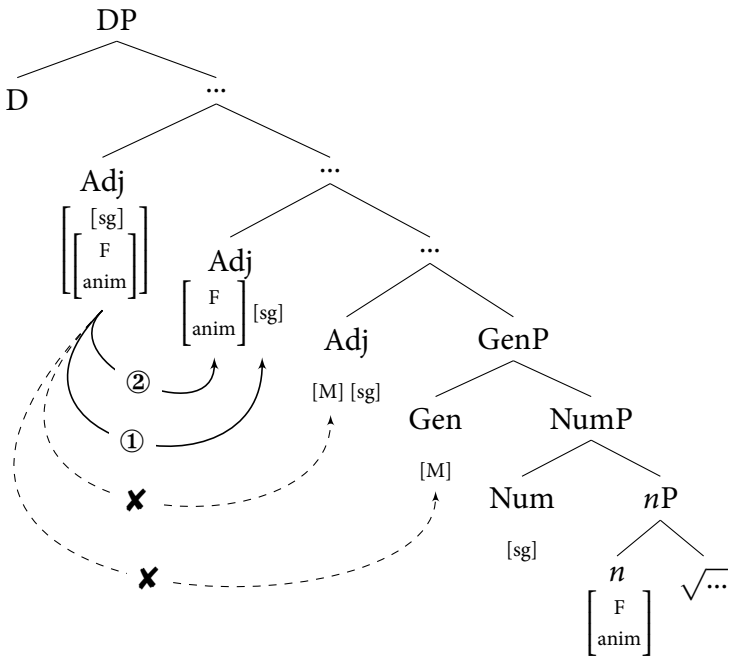


As a result, the Part's features are entirely valued by the features of D. This approach takes the influence of attributive agreement on predicate agreement quite literally, making the connection between the two clear, direct and easily derivable. This connection is captured by means

of a real syntactic interaction and the exchange of morphosyntactic information between the two. A particular derivational choice even at a very early stage of the derivation (e.g. on adjectives) can have a deterministic effect on the later stages of the derivation (e.g. on Part or other probes).

Section 3.2.2 has introduced a major advantage of this approach – it derives the agreement restrictions in the nominal domain for free. Once the natural gender is projected on one nominal modifier, any subsequently merged probe (another nominal modifier, or the predicate) will only be able to target the natural gender and the number feature projected by the this modifier. As a result, at this point the order of Agree operations becomes completely irrelevant, as any order will yield the same result – the restriction to natural gender agreement. Thus as in (333), the more complex feature on the closest Adj will be copied, together with the number feature from the same element, resulting in natural feminine gender agreement.

(333) **Agreement Hierarchy effects in the attributive slot**



Any later probe will not be able to access the grammatical gender any more, under any order of operations, as the natural gender on the higher adjective will be the closer one. The system therefore derives interactions between nominal modifiers in exactly the same way, with exactly the same results, as the interactions between nominal modifiers and predicates (e.g. in (332) above). This enables creating a unified account that applies to every agreement target in the same fashion. The account rests on a very simple principle – once a more complex feature is in a high position in the structure, it cannot be ignored by Agree. This comes as a conspiracy of two factors: the complexity of the feature and the fact that this is the highest available feature for any gender probe.

The third part of the thesis has aimed to provide a derivational account of the Predicate Hierarchy as formulated by Corbett (1983, 2006):

(334) *The Predicate Hierarchy*:
FINITE VERB > PARTICIPLE > ADJECTIVE > NOUN
'For any controller that permits alternative agreements, as we move rightwards along the Predicate Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically (that is, with no intervening decrease).'
(Corbett 1983:43ff., Corbett 2006:231)

The hybrid agreement controller that the effects of the Predicate Hierarchy were demonstrated on has been the honorific pronoun in various languages (mostly from the Indo-European family) collected by Comrie (1975); Corbett (1983); Wechsler (2011). Their summary has revealed that the finite verb consistently shows formal agreement, while the predicate noun always matches in semantic features. The targets in between vary in the kind of agreement they show. In order to account for the given patterns, I have extended the previously developed theory in order to accommodate the structure and agreement properties of pronouns. I have proposed that pronouns are full DPs, under the classification of Déchaine and Wiltschko (2002). Local person pronouns encode only natural gender on the *n*P, but lack the GenP. Instead, they project a PersP, which encodes their person features. The PersP is only projected if it encodes a [π:Participant] feature, while the lack of this feature indicates a lack of person. As a consequence, GenP and PersP stand in complementary distribution. Another way to model this dependency is to say that [π:Participant] and grammatical gender features are in complementary distribution, which indicates that they can be thought of as two different instances of the same category, i.e. that grammatical gender is a type of person.

The structure of the DP makes it possible to explain the cause of mixed agreement patterns triggered by the honorific pronoun. This hybrid agreement controller has been assumed to have semantic singular number and natural gender encoded together in a feature geometry present on the nominalizer. Yet, like all other 2nd person pronouns, it also has the plural number present on the higher functional projection, the NumP.

Furthermore, having semantic features connected in a geometry together opens a possibility for explaining how and why a probe always copies exclusively semantic or exclusively formal features (Despić 2017). Valuation of any probe's features is determined by the Condition on Agree Domains (327) and the Condition on Full Valuation (326). These conditions have two immediate consequences. If an Agree operation targets the bundle of semantic features on *n*, all of them will be copied together, if the probe has identical feature requirements, as per the CFV. Thus D, Part and the adjective will be able to copy the entire snippet. If Agree targets the Num head and the formal number feature on it, the CAD will block the access to natural number and gender, resulting in formal plural number and default gender valuation on D, Part and the adjective.

As for the mechanics of Agree on individual probes, the D is the only probe that carries out all three ϕ-Agree operations. This probe determines the agreement options for other probes by projecting either the full set of ϕ-features (by letting Gender Agree apply before all other operations), only the formal plural number and person features (by applying Number Agree at the start), or only the person features (if Person Agree precedes all others). The features that D has projected will not have much effect on agreement on T, as T will always copy the formal plural value and the person value from the pronoun. Importantly, agreement in semantic features on T is excluded by a combination of two factors: strict ordering of Agree operations and the CFV. Number Agree is always given primacy, after which Person Agree will copy the person feature (either from the Pers head or from D). T cannot copy the natural singular number since this would violate the Condition on Full Valuation – the natural gender feature that the singular number would have to pied-pipe has no place in T's unvalued features container. This once again points to a tight connection between semantic agreement and the availability of gender agreement for a given probe. The Part head will operate only on gender and number features. The possible results of orderings of Agree with respect to the specification of D are repeated in Table 8.1 below. As the table shows, whenever the D projects a full set of features, the ordering of Agree on Part becomes irrelevant since the more complex natural gender and number features are the closest goal. In other cases ordering Gender Agree first will yield semantic agreement, while the reverse order will yield formal agreement.

	Gender Agree > Number Agree	Number Agree > Gender Agree
D[γ:$\varnothing$, #:$\varnothing$, π:Participant]	[γ:F/M, animate, #:sg]	[γ:$\varnothing$, #:pl]
D[γ:$\varnothing$, #:pl, π:Participant]	[γ:F/M, animate, #:sg]	[γ:$\varnothing$, #:pl]
D[γ:F/M, #:sg, π:Participant]	[γ:F/M, animate, #:sg]	[γ:F/M, animate, #:sg]

Table 8.1: Possibilities for agreement on Part

Predicate adjectives come in two possible configurations in which they can interact with the subject honorific pronoun. When the pronoun is merged as the specifier of the PredP to which the AP is a complement, the adjective will agree with the DP that c-commands it in an upward fashion. As a result, the adjective will only be able to copy the features that D has copied. If, however, the adjective actually directly selects the subject DP as its complement, it will behave just like the Part head above, yielding the same results. Section 7.1 has demonstrated that these two possible configurations can account for the full spectrum of variation in agreement on the Pred and adjective probes, as well as for their restrictions to formal or semantic agreement.
Finally, we have seen some evidence that agreement with the predicate DP does not really involve valuation of ϕ-features of the predicate noun via syntactic Agree, since the predicate noun contains its own set of ϕ-features and does not need to preform Agree. The agreement on the final item that makes up the Predicate Hierarchy is in fact regulated by pragmatic constraints on identity of the natural gender and number features of the honorific pronoun subject and the nominal predicate.

What the Predicate Hierarchy and the Agreement Hierarchy then have in common is that patterns of agreement mostly depend on the result of agreement on D. In this sense, D will determine the possible agreement options on the different predicate probes. However, while the Agreement Hierarchy depended on the transfer of features from probe to probe, the probes that make up the Predicate Hierarchy themselves do not necessarily need to interact.

8.1 Locus of parametric variation and crosslinguistic consequences

The mechanism of Agree proposed throughout this thesis has the additional benefit of providing multiple ways of modelling parametric variation across and within different languages. The main factors that allow for parametrisation include (i) the structure and hierarchical organisation of ϕ-features, (ii) the manner and the degree of articulation of ϕ-probes and (iii) the order of application of Agree operations. On the other hand, what must be kept constant is the structure of the DP, in the sense of the position of natural and grammatical gender (and number) features. An additional constant is the Condition on Agree Domains, which should hold universally.

Possibilities for variation stemming from the structure of the DP have been reduced to a bare minimum in my account. Perhaps the only interesting and more liberal property of the DP structure lies in the encoding of number features. I have argued that languages can differ in whether they project singular as a proper feature or not. This was the issue that, for instance, differentiated BCS from Russian. We have seen that in BCS singular seems to behave like the absence of number, while in Russian, the presence of this feature on the NumP can trigger mixed agreement effects on singular nouns (Section 3.2.2). The overt encoding of the singular feature also helped derive mixed agreement effects DP-internally in Chichewa in Section 4.1.1.

When it came to the structure of features, the feature geometric approach has been shown to have the advantage in modelling parametric variation in terms of the possible feature nodes that make up a particular feature value. This was mostly illustrated on modelling the structure of gender features, which was one of the central topics of the thesis. We have seen that one way to model gender is to treat grammatical gender as being represented by only one feature node that carries a particular value, while natural gender should contain the given value accompanied by a dependent animacy node. Additionally, Section 4.1.1 revealed that this approach can be extended to different language families by having gender features be represented by different abstract values. Specifically, parallel to treating grammatical gender as being present on GenP, I assumed that noun class features in Bantu are also encoded on a GenP. In addition, I adopted Kramer's (2015*a*:252) proposal that the *n* of Bantu class 1/2 nouns encodes the feature [human]. Since the noun such as *ngwazi* 'hero' teaches us that an equivalent of natural gender can also be found in Bantu, I proposed that such gender is represented with an

additional node in the feature hierarchy, namely [human] (as opposed to 'animate' present in Slavic). Therefore, the natural gender feature can be present as a combination of gender and human-ness, equivalent to the combination of gender and animacy: [γ:1 [human]]. Presumably, a language should be able to chose how to organise its feature hierarchies and how many dependent nodes they would include based on the system of categorisation in the nominal domain it employs (i.e. gender, class, etc.).

The parametrisation of features has had a direct impact on the parametrisation of the corresponding probes. I have concretely proposed that in languages that encode natural gender on their DPs, the gender probe can be relativized to search for this feature, while in languages where the semantic features are represented by different values, such as class and 'human' in Bantu, the probe can be structured such that it looks exactly for those features.

Different degrees of articulation of the probe have found a particular practical application in deriving a cut-off point of the Agreement Hierarchy in Section 4.1.2. This is the point up to which grammatical agreement is the norm, but after which semantic agreement is allowed. Recall that German seems to be on the less permissive side when it comes to semantic agreement, which is only allowed at the far-right end of the hierarchy, namely on the personal pronoun. The cut-off point in German is therefore between the relative pronoun and personal pronoun slot. English was shown to have its cut-off point slightly further to the left – between the attributive and the predicate slot, while BCS and Russian do not seem to have one at all, thus allowing all probes to alternate. The distinctions were summarised in Table 2.1, repeated below.

	attributive	predicate	relative pronoun	personal pronoun
German: *Mädchen*	N	N/A	N	N / F
English: *committee*	SG	SG/PL	SG/PL	SG/PL
BCS: *gazde* 'masters'	F / (M)	F / (M)	(F) / M	M

Table 8.2: Agreement Hierarchy (Corbett 1991:235)

The cut-off point in the languages above can be translated into the degree of complexity of the probe. The short summary in Table 8.3 is one way of formalising the hierarchy, which points to a way to rethink the hierarchy effects. It suggests that the targets further to the right tend to have the more complex gender probe, while the targets to the left have a simpler one. This amounts to saying that the reason why targets further to the right show semantic agreement more is that they contain more complex probes.

Additionally, in Section 4.1.2.2, I have suggested that lower adjectives in the DP carry simple gender probes [$*\gamma$:□$*$], while the higher ones are relativized for natural gender and therefore search for gender and animacy together. This idea would then be merely an extension of the proposal, with the benefit of being applicable both between two slots in the hierarchy and within a single slot.

	attributive	predicate	relative pronoun	personal pronoun
German, Czech	[∗γ:□∗]	[∗γ:□∗]	[∗γ:□∗]	[∗γ:□[anim:□]∗]
English, Spanish	[∗γ:□∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]
BCS, Russian	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]	[∗γ:□[anim:□]∗]

Table 8.3: Agreement Hierarchy (Corbett 1991:235)

Finally, ordering of Agree operations as a parameter is best illustrated by the effects of the Predicate Hierarchy and agreement on different types of predicates, as well as on D in Section 7.1, summarised in the table below. Table 8.4 below presents an overview of the possible orderings of Gender Agree and Number Agree operations on D, Part and F_A in all the languages discussed in Part 2.

	D	Part	F_A	
			regular	unaccusative
Group 1	γ-Agree > #-Agree	γ-Agree > #-Agree	γ-Agree > #-Agree	γ-Agree > #-Agree
Group 1a	#-Agree > γ-Agree	#-Agree > γ-Agree	#-Agree > γ-Agree	#-Agree > γ-Agree
Group 2	#-Agree > γ-Agree	#-Agree > γ-Agree	move to Pred	γ-Agree > #-Agree
Group 4	both	both	both	both

Table 8.4: Orderings of Agree for different groups

Judging by the table above, languages can choose to maintain one order of operations throughout the grammar on all probes, or perhaps to vary the order of Agree operations depending on the type of the probe. Whether or not a language has the possibility of free ordering of Agree operations should be observable in the agreement patterns found on different targets. For instance, we know that Czech and Slovak differ in that the former always performs Gender Agree before Number Agree while the latter does the reverse, but the only way to discover this is to compare them with respect to a parameter such as agreement with the honorific pronoun. Otherwise, the difference between these two closely related languages would remain concealed. On the other hand, a language which allows for variation in the order of Agree on a single probe or between two probes should be easier to identify, based on the optionality of patterns it shows on a single target (e.g. optionality on the participle and the predicate adjective in BCS and Slovenian), or perhaps by the semantic agreement on one target and formal on another closely related one (e.g. formal agreement on the participle and semantic on the predicate adjective in Ukrainian).

One additional potential source of variation between languages could be in the type of ϕ-probes present on particular syntactic heads. For instance, following Baker (2008), I have assumed that D carries probes for all three types of ϕ-features, gender, number and person. However, it may well be imagined that this head only searches for the first two kinds of features. Similarly, in the languages discussed throughout the thesis, T was mostly assumed to

have only the person and number probes, but in case that finite verbs show gender distinctions in a particular language, for such language it could be safely assumed that its T searches for a full set of ϕ-features.

I will conclude this thesis with a short note on what the sufficient conditions are for a language to be able to allow mixed agreement patterns in some area of its grammar. On the one hand, having rich agreement morphology is not enough in itself, since there are languages with rich agreement patterns for which Agreement Hierarchy and Predicate Hierarchy effects have not been recorded in the literature I consulted. Conversely, some languages that are very scarce in agreement morphology, such as English, do show alternations in agreement. On the other hand, the necessary conditions for a language to be able to allow mixed agreement include (i) having both formal and semantic features grammatically represented on its nominal categories and (ii) allowing formal and/or semantic agreement on different targets. Once these conditions are fulfilled, it is sufficient for a language either to allow for a free order of Agree operations, or for a different degree of articulation of probes.

If a language shows variation between two different slots of the Agreement Hierarchy, chances are that the ordering of Agree in this language is free on different probes. Similarly, if a language shows variation within the single slot in the hierarchy, chances are that it allows for the different degree of articulation of probes as well. If a language allows both, chances are that its agreement patterns are going to seem as wildly unrestrained as the ones in BCS. Fortunately, thanks to the theory of agreement proposed in this thesis, we now know that what looks like unprincipled chaos on the surface actually stems from, and can be explained by, principled workings of deep syntactic processes.

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Zorica Puškar