

# **Numeral Induced Agreement Mismatches in Serbo-Croatian**

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*Anja Šarić*

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Utrecht University

Supervisors: Dr. Marjo van Koppen

Heidi Klockmann, MA

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## SUMMARY

Certain numeral phrases in the subject position in Serbo-Croatian trigger apparent mismatches in terms of features between the verb and the quantified noun. The behavior of numerals in Serbo-Croatian follows predictable trends observed in other Slavic languages in forming natural groups of cardinal numbers that impose distinct forms on the nominal elements and trigger different verbal agreement. Apart from numeral 1, which behaves like a true adjective and has no effect on the verbal morphology, cardinal numerals 2, 3 and 4 on the one hand, and 5 and above on the other, give rise to seemingly unexpected verbal forms. Similarly, the two sets of collective numerals – masculine collectives and mixed collectives, also exhibit agreement mismatches. In this thesis I focus on cardinal numbers and collective numerals in Serbo-Croatian, and I discuss agreement patterns that these numerals impose on the elements in both the nominal and the verbal domain.

To account for the behavior of different numerals, I propose that they are endowed with distinct feature specifications. Whereas numeral 1 one enters the derivation with all its features unvalued, numerals 2, 3 and 4 have inherently valued number feature and unvalued gender feature. 5+ numerals are defective in that they lack the gender feature altogether, but have an unvalued number feature. Similarly, masculine collective numerals behave on a par with 2, 3, 4 cardinals in having inherently valued number, but unvalued gender features. Mixed collectives, on the other hand, behave like 5+ cardinals and have only unvalued number features. I further argue that the observed verbal patterns are the result of the agreement or in some instances the lack of agreement with the numeral. Additionally, the behavior of adjectival elements with respect to scopal relations and agreement patterns also depends on the type of the numeral (i.e. cardinal or collective) as well as the feature specification of the numeral.

By assigning the proposed feature specification to different groups of Serbo-Croatian numerals, I implicitly suggest that they indeed are in-between categories, as previously suggested by Klockmann (2012) for Polish. If the categories of nouns and adjectives are defined by their feature specification as in Baker (2003), numerals seem to fall somewhere in between the two categories.

## LIST OF ABBREVIATIONS

ACC	accusative
CARD	cardinal
COLL	collective
DAT	dative
D(P)	determiner (phrase)
DU	dual
F	feminine
GEN	genitive
INST	instrumental
LOC	locative
M	masculine
MSC	modern Serbo-Croatian
N	neuter
NOM	nominative
N(P)	noun (phrase)
NUMP	numeral phrase
PA	paucal
PL	plural
REFL	reflexive
SG	singular
V(P)	verb (phrase)

## 1. Introduction

In the Minimalist framework, agreement is considered to be a relation between two categories which eliminates the uninterpretable features that activate these categories. For the operation Agree to apply, both categories taking part in the operation – probe and goal – must be active. A constituent is active only if it contains at least one uninterpretable feature (Chomsky, 1999). An active probe looks for a potential active goal that it c-commands to agree with. For example, in subject-verb agreement, by virtue of the fact that it has unvalued inflectional features, the verb is an active probe, searching for a possible goal in its c-command domain. The subject noun is active, as it has its case features unvalued, and as such, it serves as a suitable goal for the verb to agree with. The operation Agree takes place between the verb and the subject noun, resulting in the verb copying the features of the subject-noun, and the noun getting its case feature valued in return (Chomsky, 2000; 2001). Should there be any features left unvalued at the end of the derivation, the derivation will crash.

In Corbett's (2006) terms, agreement is defined as a relation between a controller and a target. Namely, the element that dictates the agreement (e.g. the subject NP) is called the controller, while the element whose form is established by the controller (e.g. the verb) is called the target. The agreement between a controller and a target is reflected in the features observed on them. In certain instances, however, the features observed on the verb do not mirror those of the noun. For instance, in a sentence like *A group.SG of programmers have.PL developed a new game*, the number feature of the verb (i.e. plural) does not match the number feature of the head noun (i.e. singular), yet the sentence is perfectly grammatical. In other words, the features of the probe do not match the features of its expected goal. Klockmann (2012) terms this phenomenon of “feature disagreement” between the subject-noun and the verb, *agreement mismatch*. According to Rappaport (2007: 176), in agreement mismatches “agreement targets in different environments share a single controller, but morphologically express different values for the same category”. Additionally, I limit the scope of the term – agreement mismatch – to a disparity of syntactic features between the probe/target and the goal/controller. Any form of disparity that is semantic in nature, thus, does not fall under the term agreement mismatch.

There are numerous examples in which more than one agreement form is possible. In those cases, agreement can be determined either by the form, or the meaning of the controller.

If the agreement is determined by the form of the controller, it is called syntactic agreement (or true agreement). If the agreement is determined by the meaning of the controller, it is a case of so-called semantic agreement. The choice between syntactic and semantic agreement is a consequence of a mismatch between formal and semantic properties of the controller (Corbett, 2006). For example, a subject-NP like *the audience* can have a predicate either in the singular or in the plural form depending on whether it is perceived as a single unit (i.e. verb in the singular) or as consisting of individual members (i.e. verb in the plural).<sup>1</sup> When the predicate is in the singular, it is an instance of syntactic agreement, since the noun *audience* is syntactically singular. On the other hand, when the verb is in the plural, we have semantic agreement – the noun *audience* is viewed as consisting of individual members that are predicated over by the verb in question.

According to Corbett (1983), constructional mismatches in which controllers give a choice of semantic and syntactic agreement are quite common in Slavic languages in which there are mismatches of form and meaning within a construction. Specifically, in numeral phrases, the numeral itself may not be in the plural form even though the meaning of the phrase containing it would imply plural. Languages belonging to the Slavic family are quite diverse when it comes to the agreement patterns that quantified subjects trigger, and the quantifier itself seems to be dictating the observed agreement. In addition, Corbett (2006) shows that lower numbers are more likely to trigger semantic agreement (in most cases plural) than higher ones. This is because, he claims, groups of referents quantified by larger numbers are perceived as more unified wholes, and as such, their members are less likely to be individuated, as opposed to groups modified by lower numbers, in which case counting its individual members is more likely to occur. Hence, the plural – semantic agreement is more probable with nouns quantified by lower numerals (Corbett, 2006). This is precisely what we observe in Serbo-Croatian (henceforth SC).

The behavior of numerals in SC follows predictable trends observed in other Slavic languages in forming natural groups of cardinal numbers that impose distinct forms on the nominal elements and trigger different verbal agreement. Namely, whereas numeral 1 behaves like a true adjective (it declines like an adjective and it agrees with the noun that it modifies in phi-features), numerals 2, 3 and 4 on the one hand, and 5 and above on the other,

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<sup>1</sup> The differences in terms of preference for either singular or plural agreement also depend on the variety of English. While the majority of British English speakers prefer plural, speakers of American English in most cases opt for the singular version (Johansson, 1979). The speakers of the New Zealand variety of English also show strong preference for the plural (Bauer, 1988).

display quite different behavior. Additionally, when it comes to semantic (plural) agreement, it is more acceptable with lower numbers (e.g. ?two, ?five), than it is with higher numbers (e.g. ??fifteen, \*seventy).<sup>2</sup> Consider examples (3) – (5) featuring numerals 1, 2 and 5+, respectively. The example in (1), without a numeral, is provided for comparison.

- (1) Pametan dečak je gledao film.  
clever.M.SG.NOM boy.M.SG.NOM is watched.M.SG movie  
'A clever boy watched a movie.'
- (2) Pametni dečaci su gledali film.  
clever.M.SG.NOM boys.M.PL.NOM are watched.M.PL movie  
'Clever boys watched a movie.'
- (3) Jedan pametan dečak je gledao film.  
one<sup>3</sup> clever.M.SG.NOM boy.M.SG.NOM is watched.M.SG movie  
'One/A clever boy watched a movie.'
- (4) Dva pametna dečaka su gledala/ ?gledali film.  
two clever.N.PL.NOM boy.M.SG.GEN<sup>4</sup> are watched.N.PL/ watched.M.PL movie  
'Two clever boys watched a movie.'
- (5) Pet pametnih dečaka je gledalo/ ?su gledali film.  
five clever.M.PL.GEN boys.M.PL.GEN is watched.N.SG are watched.M.PL movie  
'Five clever boys watched a movie.'
- (6) Petnaest pametnih dečaka je gledalo/ ??su gledali film.  
fifteen clever.M.PL.GEN boys.M.PL.GEN is watched.N.SG are watched.M.PL movie  
'Fifteen clever boys watched a movie.'

<sup>2</sup> The acceptability of semantic agreement was tested on 11 native speakers of Serbian (myself included) that are stationed in different parts of Serbia, and cover different dialectal varieties of standard SC. The questionnaire consisted of fill-in-the-gap items in which the informants had to write the appropriate form of the verb for a particular context. All informants answered with N.PL for 2,3,4 numerals and N.SG for 5+ numerals. In the second part of the questionnaire the participants were asked to judge the grammaticality of the sentences with semantic agreement (i.e. M.PL) on the scale from 1 to 4 – 1 being grammatical; 2 – acceptable (?); 3 – borderline (??); and 4 – unacceptable (\*). The overall results show that native speakers generally do not accept semantic agreement with higher numerals.

<sup>3</sup> I do not give feature specifications of the numerals at this point, as they are not yet clear. As I go along with the discussion, and start unraveling the feature specifications of different classes of numerals, I include them in the glosses.

<sup>4</sup> According to some authors (e.g. Zlatić, 1997; Belić, 2008) nouns modified by numerals 2, 3 and 4 are in a special form – a remnant of an old dual or paucal form. In Chapter 3 I address the possibility of the third number value in SC and I show the drawbacks of such analyses.



- (7) Sedamdeset pametnih dečaka je gledalo/ \*su gledali film.  
 seventy clever.M.PL.GEN boys.M.PL.GEN is watched.N.SG are watched.M.PL movie  
 ‘Seventy clever boys watched the movie.’

Note that the phi-features, as well as the case features on the adjective *pametni* ‘clever’ in (4) - (7), but not in (3), are different from that in (1). Additionally, the agreement on the verb (*gledao* ‘watched’) also changes in the examples (4) to (7). In sentence (3) with numeral 1, the agreement within the nominal domain, as well as verbal agreement, remains constant. That is, all elements bear the same features. The phenomena occurring in sentences (4) to (7), on the other hand, are instances of agreement mismatch. For instance, in sentences (5) – (7), there is a mismatch between the gender features of the noun (masculine) and those of the verb (neuter), as well as the number features (noun – plural; verb – singular). In the following sections, I show that it is actually the numeral that is the head of these phrases, and that the numeral itself ultimately dictates the verbal agreement. More specifically, I show that the features observed on the verb are those found on the numerals, too (in the case of numerals 2, 3 and 4), due to the operation Agree that happens between them. The features on the verb with numerals 5+, on the other hand, are the result of the unsuccessful Agree between the verb and the numeral.

Apart from cardinal numbers, SC also makes use of a special sort of numerals - collective numerals, which, as opposed to cardinal numbers, have a partitive meaning.<sup>5</sup> Modern Serbo-Croatian<sup>6</sup> (henceforth MSC) distinguishes between two sets of collective numerals: (i) those used exclusively with masculine animate nouns<sup>7</sup>; and (ii) those used with nouns with mixed or unknown natural gender<sup>8</sup>. Similar to cardinal numbers, collective numerals also trigger agreement mismatches.

- (8) Dvojica/ Petorica pametnih dečaka su gledala/ ?gledali film.  
 two/ five.COLL clever.M.PL.GEN boys.M.PL.GEN are watched.N.PL watched.M.PL movie  
 ‘Two/ Five of the clever boys watched the movie.’

<sup>5</sup> Apart from cardinal numbers and collective numerals, SC numeral phrases also include ordinal numerals, fractions and approximate quantificational expressions (e.g. Maretić, 1963; Stevanović, 1970). These, however, will not be addressed in this thesis.

<sup>6</sup> I use the terms MSC only when I wish to emphasize that the state of affairs in the present day spoken and written SC is different from that portrayed in the majority of reference grammars of SC. These often describe language that is not only archaic, but also unacceptable even for the older population of SC native speakers.

<sup>7</sup> I refer to masculine animate collective numerals as masculine collectives.

<sup>8</sup> I refer to the set of collective numerals used with nouns of mixed or unknown gender as mixed collective numerals or mixed collectives.

- (9) Dvoje/ Petoro vesele dece je igralo karte.  
 two/ five.COLL cheerful.N.PL.GEN children.N.PL.GEN is played.N.SG cards  
 'Two/ Five of the cheerful children played cards.'

With the masculine collective in (8), there is a gender mismatch between the noun *dečaka* 'boys.M.PL.GEN' and the verb form *gledala* 'watched.N.PL'. Semantic agreement is also an option (i.e. M.PL). With the mixed collective in (9), on the other hand, a number mismatch between the noun *dece* 'children.N.PL.GEN' and the verb *igralo* 'played.N.SG' occurs. In the case with mixed collectives, semantic agreement is not an option. This lack of semantic agreement is expected as the extralinguistic entities that the noun *deca* 'children' refers to are either unknown to the speaker, or are both feminine and masculine.

In this thesis, I focus on cardinal numbers and collective numerals in MSC, and the agreement mismatches described above that they trigger. I discuss agreement patterns that these numerals impose on the elements in the nominal domain (i.e. agreement between the noun, the numeral, and the adjectives)<sup>9</sup> as well as the different verbal agreement patterns that they trigger. I, however, approach this research from a synchronic standpoint and limit the scope of this thesis to modern Serbo-Croatian (MSC). Archaic forms of both cardinal and collective numerals that are not used in either spoken or written MSC will only be briefly touched upon where the necessity for it arises.

## 1.1. Thesis outline

This thesis is organized as follows. In chapter 2, I present the data, focusing primarily on the environment SC numerals appear in, and the nominal and verbal agreement mismatches they trigger. In section 2.1., I first briefly discuss the properties of nominal elements in terms of gender, number and case features. In the following sections I then turn to numerals. More specifically, I address (i) numeral 1; (ii) numerals 2, 3 and 4; and (iii) 5+ numerals separately, as they induce different agreement patterns. Additionally, I present two sets of collective numerals that MSC has at its disposal; namely, those that modify only animate nouns of masculine gender, and those that are used only with nouns of mixed or unknown natural gender. I also discuss number nouns such as *sto* 'hundred', *hiljadu*

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<sup>9</sup> I refer to agreement within the nominal domain as nominal agreement.

‘thousand’, *milion*, ‘million’ and *milijarda* ‘billion’, and their NP internal behavior, as well as the verbal agreement that they trigger. In conclusion of the chapter (section 2.3.), I present an interim summary of all the nominal and verbal agreement patterns that different sets of numerals in MSC trigger.

The following chapters are devoted to the observed agreement patterns, separately for cardinal numbers (chapter 3) and collective numerals (chapter 4). I discuss the existing approaches regarding agreement mismatches, and I present my own analysis of the phenomenon with the intention of offering a unified account for cardinal numbers on the one hand, and collective numerals on the other.

In chapter 3, I first discuss the analyses of Belić (2008) in section 3.1.2, and that of Zlatić (1997) in section 3.1.3., for numerals 2, 3 and 4 that both assume a third number value for SC – dual or minor paucal. I point out the drawbacks of these approaches; specifically, why the dual/paucal number value does not surface in MSC. In section 3.1.4., I propose a novel analysis in line with Klockmann’s (2012) treatment of Polish numerals. In section 3.2., I turn to 5+ numerals and I try to account for the distinct agreement patterns they generate, while still assuming the structure proposed for numerals 2, 3 and 4. In section 3.3., I tackle numeral 1 and show that unlike other cardinal numbers, numeral 1 should be treated as an adjective, and considered to be entering the derivation with all its features unvalued.

Chapter 4 is devoted to collective numerals. I discuss the work of Kim (2011) and I offer an alternative analysis which, to a certain extent, mirrors the proposed structure for cardinal numbers. I propose that collective numerals are more noun-like than cardinal numbers. I also show that, unlike cardinals, which refer to a whole group, collectives have a partitive meaning which is reflected in the behavior of adjectival modifiers. In section 4.1., I address masculine collectives, and in section 4.2., I examine mixed collectives.

In Chapter 5, I briefly touch upon conjoined NPs and the verbal agreement patterns that they trigger. Specifically, I offer a possible explanation as to why quantified conjoined NPs trigger masculine plural agreement on the verb, even in cases in which masculine gender is completely absent from the structure.

In Chapter 6, I reflect briefly on cardinal numerals in other Slavic languages – more specifically, Polish, Russian, Czech and Bulgarian and I draw some parallels with SC cardinals (section 6.1.). In section 6.2., I state some very general properties of Russian and Polish collectives.

Concluding remarks, in terms of summary of SC cardinals and collectives as well as issues for further research, are stated in Chapter 7.

## **2. Serbo-Croatian number system**

This chapter serves as an overview of the data used for the discussion developed in this thesis. I first briefly present basic properties of nominal elements in SC, namely, gender, number and case. I then introduce the data. In section 2.2.2., I present cardinal numbers in a manner corresponding to their behavior in terms of nominal and verbal agreement. Thus, numeral 1, numerals 2, 3 and 4, 5+ numerals, and number nouns are each presented in separate subsections. Similarly, in section 2.2.3., I present the two sets of collective numerals: masculine collectives and mixed collectives, each in their own subsection. Finally, as an interim summary in section 2.3, I lay out the agreement patterns for each of the investigated groups of numerals.

### **2.1. *Properties of nominal elements***

One of the persisting questions regarding the structure of the nominal domain in languages without determiners (e.g. SC) is the existence of the DP projection. While certain authors persist in their view that SC lacks the DP layer (e.g. Bošković, 2008), others offer evidence of its existence (e.g. Bašić, 2004). However, to go into details and present argumentation for both views is beyond the scope of this thesis. For the purposes of the discussion I develop in this work, I assume that the nominal domain in SC constitutes a phase, regardless of whether it has a DP layer or not.

Nouns in SC make a distinction between grammatical gender on the one hand, and natural gender on the other. With the majority of nouns, the value for grammatical gender is mirrored in the noun's value for natural gender. In some cases, however, the two do not necessarily coincide. Every noun is inherently specified with one value for the grammatical category of gender. The possible values that SC has at its disposal are masculine, feminine and neuter. Nouns denoting male persons, as well as male animals (e.g. *lisac* 'fox<sub>M</sub>' versus *lisica* 'vixen<sub>F</sub>') usually have masculine gender, whereas those denoting female persons and animals have feminine gender. Nouns denoting inanimate referents that cannot be discriminated in terms of sex can bear either masculine, feminine or neuter gender. For example *stolica* 'chair' has feminine gender, *krevet* 'bed' is masculine, and *ogledalo* 'mirror'

is neuter. On the other hand, the noun *dete* ‘child’, although belonging to one of the two sexes (i.e. its natural gender is either masculine or feminine) still bears neuter gender features.

The same three-way gender distinction is also preserved with the plural forms of nouns: *stolice* ‘chairs’ has feminine gender, *kreveti* ‘beds’ is masculine, and *ogledala* ‘mirrors’ has neuter gender. While in the singular form the noun *brat* ‘brother’ bears masculine gender feature, in the plural form – *braća* ‘brothers’ – it changes into neuter. This is gender alternation is specific to the noun *braća* ‘brothers’ because it belongs to a special set of collective nouns in SC (Stankiewicz, 1986). I address collective nouns in section 4.2., where I discuss mixed collectives, as collective nouns can only be quantified by this set of numerals.

The natural gender of the noun is a gender to which that noun would be expected to belong based on the sex of its referent. As already pointed out, in SC the value of the natural gender does not necessarily match that of the grammatical gender. For instance, diminutive nouns of feminine referents display a grammatical/natural gender mismatch. The noun *devojkica* ‘girl’, which has feminine gender in its regular form, is specified with different gender features when the form is diminutive. *Devočurak* or *devojkice* ‘little girl’ is specified with masculine and neuter grammatical gender, respectively, although their referent is obviously feminine. Grammatical gender, however, always takes precedence over natural gender when it comes to verbal agreement. Namely, in a sentence like *Devojkice je spavalo* ‘The girl.DIMINUTIVE slept’, the verb is always in the neuter singular form, thus matching the grammatical gender of the noun. A feminine singular verb form is not an option in this case.

The behavior of nouns in SC is generally insensitive to both animacy and humanness. However, the animacy/ humanness feature of the noun in certain cases dictates its ability to appear with certain numeral modifiers. For example, only masculine nouns denoting human referents can be quantified by the set of masculine collective numerals. I elaborate on this in section 4.1.

SC is a highly inflected language. This rich morphology, in part, comes from its extensive case system. Most of the nominal elements decline by adding a particular ending to the root, depending on the case of the word in question. The cases in SC are: nominative, genitive, dative, accusative, vocative, instrumental and locative. I present Table (1) below as an illustration of the declension patterns of a masculine, feminine and neuter noun in both their singular and plural forms.

Table 1: Declension of a masculine, feminine and neuter noun

<i>Noun Declension</i>							
<i>Case</i>	<i>Gender</i>	<i>Masculine</i>		<i>Feminine</i>		<i>Neuter</i>	
	<i>Number</i>	<i>Singular</i>	<i>Plural</i>	<i>Singular</i>	<i>Plural</i>	<i>Singular</i>	<i>Plural</i>
<i>Nominative</i>		momak	momci	sestra	sestre	dete	deca
<i>Genitive</i>		momka	momaka	sestre	sestara	deteta	dece
<i>Dative</i>		momku	momcima	sestri	sestrama	detetu	deci
<i>Accusative</i>		momka	momke	sestru	sestre	dete	decu
<i>Vocative</i>		momak	momci	sestro	sestre	dete	deco
<i>Instrumental</i>		momkom	momcima	sestrom	sestrama	detetom	decom
<i>Locative</i>		momku	momcima	sestri	sestrama	detetu	deci

Glosses: *momak* 'boy', *sestra* 'sister' and *dete* 'child'

When it comes to number features, formally, MSC has two values: singular and plural. However, certain authors (e.g. Zlatić, 1997; Belić, 2008) claim that there is a third number value in MSC: a special dual or minor paucal form of the number; or at least a form that is a remnant of what once used to be a dual/paucal number. When a noun is in a dual form, it refers precisely to two entities. This special, third number value, interestingly, in MSC only surfaces when cardinal numbers 2, 3 or 4 are involved. According to Zlatić (1997), in MSC, the remnant of the dual form has been extended from numeral 2 to 3 and 4. Zlatić (1997) argues that numerals 2, 3, and 4 behave differently from other numerals in SC in that they impose a special form on the noun that they quantify over – a so called 234 form (Browne, 1993). Additionally, according to her, the numerals not only impose a specific form on the noun, but on other elements within the noun phrase (i.e. adjectives and demonstratives) as well. The verb forms predicating over nouns in this 234 form show true agreement and likewise appear in their 234 forms.

According to Kordić (1997) and Belić (2008), in SC and Belorussian, numerals 2, 3 and 4 are followed by a noun which is in the form of the Common Slavic nominative dual which has merged with the genitive singular form and which they term *minor paucal*. Paucal number occurs with nouns in contexts in which they refer to a few entities. Slavic languages

which have lost the dual/paucal form distinction have simplified their number systems by either extending the pattern of 3 and 4 (i.e. paucal number) to 2 (Czech, Slovak, Polish and Ukrainian) or by extending the pattern of 2 (dual number) to 3 and 4 (Serbo-Croatian and Belorussian) (Mayer, 1973).

In sections 3.1.2 and 3.1.3., I show that the claim that MSC has a third number value lacks empirical evidence. I critically assess the approaches of Zlatić (1997) and Belić (2008) and I point out the drawbacks that their analyses face. I then conclude that MSC has two number values – singular and plural.

## 2.2. Numerals in Serbo-Croatian

The SC numeral phrases that are explored in this thesis are those involving (i) cardinal numbers, (ii) collective numerals and (iii) number nouns. Cardinal numbers generally do not decline in MSC (Mrazović & Vukadinović, 1990), and neither does the set of mixed collectives. As opposed to collective numerals which imply collective meaning, cardinal numbers are used to express individuated meaning. They are used for expressing quantity, or for indicating the amount of something (Kim, 2011). The distinction between cardinal and collective numerals in SC fits well into Stankiewicz’s (1986) four-fold schemata of plurals in Slavic languages.

Table 2: Plurals in Serbo-Croatian (adapted from Stankiewicz (1986: 155) and Kim (2011: 86))

Simple Plural		Counted Plural	
devojčice ‘girls’ girls-F.PL.NOM	(dve) two-CARD	devojčice <sup>10</sup> girl-F.SG.GEN	‘two girls’
dečaci ‘boys’ boys-M.PL.NOM	(dva) two-CARD	dečaka boy-M.SG.GEN	‘two boys’
	(dva) two-CARD	brata brother-N.SG.GEN	‘two brothers’
deca ‘children’ children-N.PL	dvoje two-COLL	dece children-N.PL.GEN	‘two children’
braća ‘brothers’ brothers-N.PL	dvojica two-COLL	braće brothers-N.PL.GEN	‘two brothers’
	dvojica two-COLL	dečaka boys-N.PL.GEN	‘two boys’
Collective Plural		Counted Collective Plural	

<sup>10</sup> Note that the noun *devojčica* ‘girl’ (and all other feminine nouns) has the same form for nominative plural and for genitive singular. In Chapters 2 and 3, I offer arguments as to why I consider feminine nouns modified by numerals 2, 3 and 4 to be genitive singular, rather than nominative plural.

As can be seen from Table (2), nouns like *devojčice* ‘girls’ and *dečaci* ‘boys’ that have simple plural forms appear with cardinal numbers. On the other hand, nouns like *deca* ‘children’ and *braća*<sup>11</sup> ‘brothers’ that appear in the collective plural forms, can only be quantified by collective numerals. The difference between the simple and the collective plural forms of nouns is, for one thing, in the way they decline. Additionally, the simple and collective plural forms are not mutually exclusive. For example, the noun *cvet* ‘flower’, has both the simple plural form – *cvetovi* ‘flowers’, and the collective plural form *cveće* ‘flowers’. Moreover, simple plurals can be quantified by collective numerals, but not vice versa. That is, a simple plural noun like *dečaci* ‘boys’ can be modified by a collective numeral like *dvojica* ‘two.COLL’, (i.e. *dvojica dečaka*). However, a collective noun like *braća* ‘brothers’ cannot appear with a cardinal number like *dva* ‘two’ (i.e. \**dva braća*).

### 2.2.2. Cardinal numbers

The behavior of cardinal numerals in SC follows predictable trends observed in other Slavic languages (Corbett, 1978), by forming natural groups that impose distinct forms on the nominal elements and trigger different verbal agreement. Namely, whereas numeral 1 behaves like a true adjective, numerals 2, 3 and 4 on the one hand, and 5 and above on the other, display a quite different behavior. I address each in turn.

#### 2.2.2.2. One

The behavior of number one – *jedan* patterns to that of adjectives. Additionally, all numbers ending in *jedan* ‘one’ (e.g. *dvadesetjedan* ‘twenty-one’, *stojedan* ‘hundred and one’ etc) follow the same pattern, except for the number *jedanaest* ‘eleven’ which behaves like numerals above 5. The numeral agrees with the noun in phi features and case features. This is illustrated in Table (3) below.

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<sup>11</sup> The noun *brat* ‘brother’, although having only collective plural form (i.e. *braća*) can be quantified by some cardinal numbers. More specifically, it can be modified only by numerals 2, 3 and 4. This is because these numerals modify nouns in their singular forms. Numerals larger than five modify nouns in their plural forms; hence *brat* cannot appear with them. Instead collective numerals are used.



*Table 3: Declension of NPs quantified by the numeral one*

<i>Declension of NPs quantified by the numeral one</i>							
<i>Gender</i>	<i>Case</i>	<i>Nominative</i>	<i>Genitive</i>	<i>Dative</i>	<i>Accusative</i>	<i>Instrumental</i>	<i>Locative</i>
<b>Masculine</b>		jedan	jednog	jednom	jednog	jednim	jednom
		pamet <span style="font-weight: bold;">an</span>	pamet <span style="font-weight: bold;">nog</span>	pamet <span style="font-weight: bold;">nom</span>	pamet <span style="font-weight: bold;">nog</span>	pamet <span style="font-weight: bold;">nim</span>	pamet <span style="font-weight: bold;">nom</span>
		dečak	dečaka	dečaku	dečaka	dečakom	dečaku
<b>Feminine</b>		jedna	jedne	jednoj	jednu	jednom	jednoj
		pametna	pametne	pametnoj	pametnu	pametnom	pametnoj
		devojčica	devojčice	devojčici	devojčicu	devojčicom	devojčici
<b>Neuter</b>		jedno	jednog	jednom	jedno	jednim	jednom
		pametno	pametnog	pametnom	pametno	pametnim	pametnom
		dete	deteta	detetu	dete	detetom	detetu

**Glosses:** *jedan pametan dečak* 'one.M.SG.NOM smart.M.SG.NOM boy.M.SG.NOM', *jedna pametna devojčica* 'one.F.SG.NOM smart.F.SG.NOM girl.F.SG.NOM', *jedno pametno dete* 'one.N.SG.NOM smart.N.SG.NOM child.N.SG.NOM'<sup>12</sup>

Just like adjectives, numeral 1 does not affect the form of the verb that predicates over the modified noun.

(10) Pametna devojčica je pročitala knjigu.  
 smart.F.SG.NOM girl.F.SG.NOM is read.F.SG book  
 'A smart girl read a book.'

(11) Jedna pametna devojčica je pročitala knjigu.  
 one.F.SG.NOM smart.F.SG.NOM girl.F.SG.NOM is read.F.SG book  
 'One/A smart girl read a book.'

### 2.2.2.3. Two, three and four

Numerals 2, 3, and 4 behave differently from the numeral 1 and numerals 5 and above with respect to nominal and verbal agreement. Additionally, in MSC, numerals 2, 3, and 4 appear in one basic form and generally do not decline. The noun that they modify does not decline either, as shown in Table (4).

<sup>12</sup> For the reasons of space, I only provide glosses for the nominative forms for all three genders. For the rest of the case forms the feature specification for each of the elements remains the same (i.e. number and gender), with, of course, different case features. This holds for examples in all other tables, too, unless specified differently.

**Table 4: Declension of NPs quantified by numerals two, three and four**

<i>Declension of NPs quantified by numerals two, three and four</i>							
<i>Gender</i>	<i>Case</i>	<i>Nominative</i>	<i>Genitive</i>	<i>Dative</i>	<i>Accusative</i>	<i>Instrumental</i>	<i>Locative</i>
<b>Masculine</b>		dva/ tri/ četiri	dva/ tri/	/	dva/ tri/	dva/ tri/ četiri	dva/ tri/
		pametna	četiri		četiri	pametna	četiri
		dečaka	pametna dečaka		pametna dečaka	dečaka	pametna dečaka
<b>Feminine</b>		dve/ tri/ četiri	dve/ tri/	dvema/	dve/ tri/	dve/ tri/ četiri	dve/ tri/
		pametne	četiri	?trima/	četiri	pametne	četiri
		devoјčice	pametne devoјčice	??četrima pametnim devoјčicama	pametne devoјčice	devoјčice	pametne devoјčice
<b>Neuter</b>		dva/ tri/ četiri	dva/ tri/	/	dva/ tri/	dva/ tri/ četiri	dva/ tri/
		pametna	četiri		četiri	pametna	četiri
		deteta <sup>13</sup>	pametna deteta		pametna deteta	deteta	pametna deteta

**Glosses:** *dva/tri/četiri pametna dečaka* 'two/three/four smart.N.PL.GEN boy.M.SG.GEN', *dve/tri/četiri pametne devoјčice* 'two/three/four smart.F.PL.GEN girl.F.SG.GEN', *dva/tri/četiri pametna deteta* 'two/three/four smart.N.PL.GEN child.N.SG.GEN'.

It should be noted, however, that in the majority of reference grammars of SC (e.g. Hammond, 2005), numeral 2 is declined in the way presented in Table (5) below.

**Table 5: Archaic forms of declined NPS with numerals two, three and four**

<i>Declension of NPs quantified by numerals two, three and four</i>							
<i>Gender</i>	<i>Case</i>	<i>Nominative</i>	<i>Genitive</i>	<i>Dative</i>	<i>Accusative</i>	<i>Instrumental</i>	<i>Locative</i>
<b>Masculine/Neuter</b>		dva	dvaju	dvama	dva	dvama	dvama
		dečaka/	dečaka/	dečacima/	dečaka/	dečacima/	dečacima/
		deteta	deteta	deci	deteta	decom	deci
<b>Feminine</b>		dve	dveju	dvema	dve	dvema	dvema
		devoјčice	devoјčica	devoјčicama	devoјčice	devoјčicama	devoјčicama

**Glosses:** *dva dečaka/ deteta* 'two.NOM boy.M.NOM-/children.N.NOM', *dve devoјčice* 'two.NOM girls.F.NOM'.<sup>14</sup>

However, the declension of numeral *dve/dva* 'two' in this manner is quite archaic and is not used in either spoken or written language. Moreover, for the neuter nouns modified by 2 in the way presented in Table (5) for the dative, instrumental and locative cases, 9/10 native speakers of SC did not know which form to use. For this reason, forms of the numeral 2 from

<sup>13</sup> The noun *dete* 'child' does not have a counted plural form, and yet it can appear with numerals 2, 3 and 4, but not with 5+ numerals. This is precisely because, as I argue in Section 3.1, numerals 2, 3 and 4 can only appear with singular nouns.

<sup>14</sup> According to Hammond (2005), the numeral 2 declines together with the noun, and the two bear the same case. The reason why I do not specify the number feature of either the noun or the numeral, or the gender feature of the numeral is because Hammond does not give it either. I cannot speculate the possible number and gender features, as I am not familiar with these forms.

Table (5) will not be analyzed in this thesis. The forms *dva/dve* ‘two’ are used in the same manner as numerals *tri* ‘three’ and *četiri* ‘four’, as presented in Table (4).

As can be seen from the table, it is not possible to express dative with masculine and neuter nouns quantified by numerals 2, 3 and 4. This is captured under the Serbo-Croatian Dative/Instrumental<sup>15</sup> Case Realization Condition in (12).

(12) *If a verb or a noun assigns dative or instrumental case to an NP, then that case must be morphologically realized by some element within the NP.*

(Wechsler & Zlatić, 2001: 550)

It should be noted, however, that numerals can express instrumental case in certain instances. In SC, nouns bearing instrumental case can have two meanings: first, they can denote instruments (i.e. tools, objects), and secondly, they can denote accompaniment. Crucially, the only thing that distinguishes between the two possible meanings is the presence/absence of the preposition *sa* ‘with’. When preceded by the preposition, nouns bearing instrumental case have the meaning of accompaniment, whereas if they appear bare, they denote instruments. Consider sentences in (13) – (14) which illustrate the instrument/accompaniment distinction.

(13)

a. Deca su se igrala autićima.  
 children are REFL played cars(diminutive).INST  
 ‘Children played with toy cars.’

b. \*Deca su se igrala dva autića.  
 children are REFL played two cars.GEN.SG  
 ‘Children played with two car-toys.’

(14) Deca su se igrala sa dva rođaka.  
 children are REFL played with two cousin.GEN.SG  
 ‘Children played with two of their cousins.’

The sentence in (13b), in which the noun modified by the numeral expresses an instrumental meaning, is ungrammatical. This is because none of the elements in the NP morphologically

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<sup>15</sup> Instrumental case can be expressed with numerals 2, 3 and 4, but only when it appears with the preposition. I elaborate on this in the remainder of this section.

express instrumental case. Conversely, the sentence in (14), in which the NP has a accompaniment meaning, is grammatical. Note that in (14), just like in (13a), neither the numeral (because it is indeclinable) nor the noun (because the numeral in question cannot modify nouns in instrumental) display any visible (i.e. morphological) properties which would suggest that the whole NP is in the instrumental; yet (14) is still grammatical. This is because the preposition *sa* ‘with’ is an instrumental case marker (Franks, 1995), and as such it is enough for it to be present in a particular construction for the sentence to be felicitous, even though none of the NP internal elements bear instrumental case (Wechsler & Zlatić, 2001).

Some speakers of SC accept (13b) with the preposition *sa* ‘with’, although its literal meaning would be that of accompaniment – two cars and children played together. Due to its lack of meaning with an accompaniment reading, it is possible for (13b) to obtain the instrument reading.

- (15) ?Deca su se igrala sa dva autića.<sup>16</sup>  
 children are REFL played with two cars.GEN.SG  
 ‘Children played with two car-toys.’

The Serbo-Croatian Dative/Instrumental Case Realization Condition in (12) should thus be reformulated so as to capture the observed differences with respect to the preposition *sa* ‘with’:

- (16) *If a verb or a noun assigns dative or instrumental case to an NP, then that case must be morphologically realized by some element within the NP; except when the preposition ‘sa’ (‘with’) is present, in which case no morphological realization of instrumental case on any element within the NP is obligatory, as the preposition itself serves as a case marker.*

Another way of capturing the differences that *sa* makes is to employ Grimshaw’s (2000) notion of an Extended Projection.<sup>17</sup> Under this view then, the Serbo-Croatian Dative/Instrumental Case Realization Condition could be reformulated as follows.

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<sup>16</sup> For all native speakers questioned, the sentence in (15) is acceptable. Two out of eleven informants gave it (?), for the rest it is perfectly well-formed.

<sup>17</sup> I thank Heidi Klockmann for bringing this up.

(17) *If a verb or a noun assigns dative or instrumental case to an NP, then that case must be realized within the extended projection of the noun, either morphologically, or via a preposition.*

As for feminine nouns, declension for dative is possible with numerals 2 and 3, but less so for 4. In the case of 2 and 3, both the numeral and the noun decline.

(18) Ana je dala tortu dvema/ ?trima/ ?\*četrima devojka  
 Ana is given cake two.DAT/ ?three.DAT/ ?\*four.DAT girls.DAT  
 ‘Anna gave a cake to two/three/four girls.’

In order to express the proposition in (18), speakers of SC have to use different structures such as, for example the passive construction in (19):

(19) Dve/ tri/ četiri devojke su dobile tortu od Ane  
 two/ three/ four girls are got cake from Anna  
 ‘Two/three/four girls got a cake from Anna.’

The same holds for masculine and neuter nouns. With masculine human nouns, a collective form of the numeral which is declinable (e.g. *dvojici dečaka* ‘two.COLL.DAT boys.DAT’) is available. I address collective numerals in section 2.2.3.

Apart from the restrictions regarding the case realization that these numerals impose, the presence of 2, 3 or 4 triggers certain changes both in the nominal and verbal domain. These changes are also dependent on the gender of the modified noun. Consider examples (20) – (22) featuring a noun in feminine, masculine and neuter gender, respectively. Sentences in (b) are without the numeral, while the ones in (a) feature the numeral.

(20)

- a. Dva visoka dečaka su igrala fudbal.  
 two tall.N.PL.NOM boy.M.SG.GEN are played.N.PL football  
 ‘Two tall boys played football.’
- b. Visoki dečaci su igrali fudbal.  
 tall.M.PL.NOM boys.M.PL.NOM are played.M.PL football  
 ‘Tall boys played football.’

(21)

- a. Dve male devojčice su igrale fudbal.  
two little-FEM.PL.NOM girl-F.SG.GEN are played-F.PL football  
'Two little girls played football.'

- b. Male devojčice su igrale fudbal.  
little-F.PL.NOM girls-F.PL.NOM are played-F.PL football  
'Little girls played football.'

(22)

- a. Dva nemirna deteta su igrala fudbal.  
two unruly-N.PL.NOM child-N.SG.GEN are played-N.PL football  
'Two unruly children played football.'

- b. Nemirna deca su igrala fudbal.  
unruly-N.PL.NOM children-N.PL.NOM are played-N.PL football  
'Unruly children played football.'

Note first that the form of the numeral used in (21a) to modify a feminine noun, differs from that used in (20a) and (22a) to modify a masculine and neuter noun, respectively. Namely, the form *dve*<sup>18</sup> 'two' is used with feminine nouns, and *dva* 'two' with masculine and neuter nouns. Note next that in (22a) and possibly (21a) the numeral only triggers a change in the form of the noun. However, in (20a) with a masculine noun, the numeral seems to trigger the change of other elements as well. More specifically, all the other elements modifying the noun change from their original masculine gender to neuter. Additionally, the agreement on the verb also changes into neuter plural.

#### 2.2.2.4. Five +

Numerals 5 to 11, and 11 to 19, as well as all other numerals ending in 5, 6, 7, 8 or 9 behave differently from 1 on the one hand, and 2, 3 and 4, on the other. Consider Table (6) as an illustration.

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<sup>18</sup>For numerals three and four the form for all genders is the same: *tri* 'three' and *četiri* 'four'. However, the same behavior in terms of determiners, adjectives, nouns, and especially verbal agreement suggest that the distinction should still be made between the feminine and neuter form of the numerals. In addition, the ability of the feminine form for two and three to appear in the dative also suggests that the two forms should be considered as different.

**Table 6: Declension of NPs quantified by the numeral five**

<i>Declension of NPs quantified by the numeral five</i>							
<i>Gender</i>	<i>Case</i>	<i>Nominative</i>	<i>Genitive</i>	<i>Dative</i>	<i>Accusative</i>	<i>Instrumental</i>	<i>Locative</i>
<b>Masculine</b>		pet pametnih dečaka	pet pametnih dečaka	/	pet pametnih dečaka	pet pametnih dečaka	pet pametnih dečaka
<b>Feminine</b>		pet pametnih devojčica	pet pametnih devojčica	/	pet pametnih devojčica	pet pametnih devojčica	pet pametnih devojčica
<b>Neuter</b>		/	/	/	/	/	/

**Glosses:** *pet pametnih dečaka* 'five smart..M.PL.GEN boys-M.PL.GEN', *pet pametnih devojčica* 'five smart.F.PL.GEN girls-F.PL.GEN'

Note that the neuter row of Table (6) is empty. This is because the noun *deca* 'children' cannot be modified by cardinal numbers that are greater than 5. Instead, in order to express the quantity of five or more referents denoted by the noun of neuter gender that has animate referents, collective numerals have to be employed (see section 2.2.3. for details). Nonetheless, if the noun is neuter inanimate, it behaves like masculine nouns when modified by 5+ numerals. In other words, it imposes neuter singular agreement on the verb, and neuter plural on the adjective. The noun itself is in the plural and bears genitive case.

(23)

- a. Ta duboka jezera su presušila.  
 Those.N.PL.NOM deep.N.PL.NOM lakes.N.PL.NOM are dried.out.N.PL  
 'Those deep lakes dried out.'
- b. Tih pet dubokih jezera je presušilo.  
 Those.N.PL.GEN five deep.N.PL.GEN lakes.N.PL.GEN are dried.out.N.SG  
 'Those five deep lakes dried out.'

Additionally, just like with 2, 3 and 4, 5+ numerals cannot express the dative case (e.g. \**Dala je jabuke pet devojčica/ dečaka*. 'She gave apples to five girls.DAT/ boys.DAT.') Hence the Serbo-Croatian Dative/Instrumental Case Realization Condition in (16) and (17) should be extended to 5+ numerals, too. When it comes to nominal and verbal agreement, 5+ numerals behave quite differently from 2, 3 and 4. Consider examples (24) – (29) as an illustration.

- (24) Pet visokih dečaka je igralo fudbal.  
 five tall.M.PL.GEN boys.M.PL.GEN is played.N.SG football  
 'Five tall boys played football.'

- (25) ?Pet visokih dečaka su igrali fudbal.  
 five tall.M.PL.GEN boys.M.PL.GEN are played.M.PL football  
 ‘Five tall boys played football.’
- (26) Pet malih devojčica je igralo fudbal.  
 five little.F.PL.GEN girls.F.PL.GEN is played.N.SG football  
 ‘Five little girls played football.’
- (27) ?Pet malih devojčica su igrale fudbal.  
 five little.F.PL.GEN girls.F.PL.GEN are played.F.PL football  
 ‘Five little girls played football.’
- (28) Pet velikih ogledala je visilo na zidu.  
 five big.N.PL.GEN mirrors.N.PL.GEN is hung.N.SG on wall  
 ‘Five big mirrors hung on the wall.’
- (29) ?Pet velikih ogledala su visila na zidu.  
 five big.N.PL.GEN mirrors.N.PL.GEN are hung.N.PL on wall  
 ‘Five big mirrors hung on the wall.’

The numeral seems to be imposing genitive case on both the noun and the adjective, and neuter singular agreement on the verb, or masculine, feminine and neuter plural, respectively (i.e. semantic agreement).

#### 2.2.2.5. *Number nouns*

Numerals *sto* ‘hundred’, *hiljadu* ‘thousand’, *milion* ‘million’ and *milijarda* ‘billion’ are actually nouns used to express numbers. Like other nouns in SC, these have number, gender and case features which are morphologically expressed in terms of different endings.

- (30)
- a. Trčalaje maraton sa sotinom/ hiljadom/ milionom drugih žena.  
 run.she is marathon with hundred.INST/ thousand.INST/ milion.INST other.GEN women.GEN  
 ‘She ran the marathon with hundred/ thousand/ million/ billion other women.’

There is, however, another, indeclinable form for these number nouns:



- b. Trčalaje maraton sa sto/ hiljadu/ milion drugih žena.  
 run.<sub>she</sub> is marathon with hundred.<sub>NOM</sub>/ thousand.<sub>NOM</sub>/ milion.<sub>NOM</sub> other.<sub>GEN</sub> women.<sub>GEN</sub>  
 ‘She ran the marathon with hundred/ thousand/ million/ billion other women.’

Although used synonymously, the two forms for ‘hundred’ – *sto* and *stotina*, nevertheless, display subtle differences when it comes to interpretation. Consider the example in (31).

- (31) Sto/Stotinu dečaka/ devojčica/ dece je pevalo u horu.  
 hundred boys/ girls/ children is sang in choir  
 ‘A hundred boys/ girls/ children sang in the choir.’

While *sto* has the exact interpretation (i.e. exactly one hundred boys sang in the choir), *stotinu* has a more approximate one – around one hundred boys sang in the choir. When it comes to behavior in terms of phi-features, the two forms follow different patterns. Whereas *sto* follows the pattern of 5+ numerals and does not decline with the noun that it quantifies over, *stotinu* behaves like other number nouns (*hiljadu* ‘thousand’, *milion* ‘million’ and *milijarda* ‘billion’) and declines in the same manner as regular nouns do which is also the behavior that masculine collectives exhibit, as I show in the following section. Moreover, by virtue of the fact that it has the status of a noun, *stotinu* can appear without any nominal to quantify over (32).

- (32) Dekan se obratio stotini/\*sto.  
 dean REFL addresses hundred.<sub>DAT</sub>  
 ‘The dean addressed around hundred people.’

Hence, from this point forward, number nouns will be treated as masculine collectives, except the form *sto* which will be treated as 5+ numerals.

### 2.2.3. Collective numerals

A special sort of numerals –collective numerals – is used when denoting a number of referents of mixed or unknown natural gender (i.e. mixed collectives) or masculine animate

referents (masculine collectives)<sup>19</sup>. They can be formed with all numbers up to 99, except those ending in 1 (1, 21, 51 etc.). As opposed to cardinal numbers, collective numerals have a partitive meaning. Consider the subtle, but nevertheless detectable differences in meaning between the cardinal number and the collective numeral:

(33)

- a. Petorica visokih plavih dečaka su igrala fudbal.  
 five.COLL tall.M.PL.GEN blonde.M.PL.GEN boys.M.PL.GEN are played.N.PL football  
 ‘Five of the tall blonde boys played football.’
- b. Pet visokih plavih dečaka je igralo fudbal.  
 five.CARD tall.M.PL.GEN blonde.M.PL.GEN boys.M.PL.GEN is played.N.SG football  
 ‘Five of the tall blonde boys played football.’

In (33a), there are a number of tall, blonde boys, and five of them happen to play football. In (33b), on the other hand, it is the case that there are five boys playing football, and they happen to be tall and blonde. In other words, with cardinal number, there is the total of five boys who are tall and blonde. With the collective numeral, there is a certain number (greater than five) of tall and blonde boys, and five of them play football. This distinction becomes even more pronounced once one of the adjective gets fronted.

<sup>19</sup> Kim (2011) refers to mixed collectives and masculine collectives as collective numerals and collective numeral substantives, respectively. The author uses the notion of collective numbers as an umbrella term for three types of collectives in SC: (i) collective numeral substantives (e.g. *dvojica dečaka* ‘two boys’), (ii) collective numerals (*dvoje učesnika* ‘two participants’), and (iii) collective numeral adjectives (*dvoja vrata* ‘two doors’). Putting aside the set of collective numeral substantives, the difference between collective numerals and collective numeral adjectives lies in the fact that the latter agree with the nouns that they modify (Maretić, 1963; Šipka & Zorc, 2007).

Agreeing Collective Numerals				Non-Agreeing Coll. Num.
Plural				Singular
Gender	Masculine	Feminine	Neuter	Neuter
2	dvoji	dvoje	dvoja	dvoje
3	troji	troje	troja	troje
4	četvori	četvore	četvora	četvoro
5	petori	petore	petora	petoro

The non-agreeing collective numerals quantify nouns that refer to animate things of mixed gender. According to some authors (e.g. Magner, 1995; Mrazović & Vukadinović, 1990), the plural agreeing collective numerals (i.e. numeral adjectives) modify inanimate *pluralia tantum* nouns (e.g. *četvore makaze* ‘four scissors.F.NOM’). However, this use of collective numerals is quite archaic, and is not encountered in present day Serbo-Croatian – neither in the spoken or the written medium. Instead of using the agreeing set of collective numerals, all *pluralia tantum* nouns, as well as collective nouns pair up with the non-agreeing collective numerals (i.e. *četvoro makaza* ‘four scissors.F.GEN’). Hence, in this thesis I discuss only the non-agreeing collective numerals which I call mixed collectives.

(34)

- a. Plava petorica visokih dečaka su igrala fudbal.  
blond.<sub>N.PL.NOM</sub> five.<sub>COLL</sub> tall.<sub>M.PL.GEN</sub> boys.<sub>M.PL.GEN</sub> are played.<sub>N.PL</sub> football  
'Five of the blonde tall boys played football.'
- b. Plavih pet visokih dečaka je igralo fudbal.  
blonde.<sub>M.PL.GEN</sub> five.<sub>CARD</sub> tall.<sub>M.PL.GEN</sub> boys.<sub>M.PL.GEN</sub> is played.<sub>N.SG</sub> football  
'Five blonde tall boys played football.'

In (34b) the meaning of the sentence does not change when compared to that in (33b). The only difference is that this time, the speaker wants to emphasize that the boys were blonde. The meaning of (34a), nevertheless, changes significantly. Namely, the interpretation is that there is a number (greater than five) of tall boys, and the five of them who are also blonde, are playing football. Thus, it is evident that collective numerals are not only used with different types of nouns (collective nouns, instead of simple plural – *deca* 'children' versus *dečaci* 'boys'), but that when used with the exact same noun in indistinct environments, they entail a quite different interpretation.

### 2.2.3.2. *Masculine collectives*

The set of masculine collective numerals only quantify masculine nouns with human referents. These numerals directly signal that the following noun will denote a group of male human referents. Interestingly, certain native speakers of SC have a preference for a collective numeral to modify a masculine noun instead of a cardinal number:

(35)

- a. ?Dva dečaka su igrala tenis.  
two.<sub>CARD</sub> boys.<sub>M.SG.GEN</sub> are played.<sub>N.SG</sub> tennis  
'Two boys played tennis.'
- b. Dvojica dečaka su igrala/ igrali tenis.  
two.<sub>COLL</sub> boys.<sub>M.PL.GEN</sub> are played.<sub>N.PL</sub>/ played.<sub>M.PL</sub> tennis  
'Two of the boys played tennis.'

The observed agreement on the verb is neuter plural, while some native speakers accept masculine plural (i.e. semantic agreement). As opposed to the cardinal numbers which are

generally indeclinable, the collective numeral always declines (in the same manner as nouns in SC decline), and the modified noun always remains in the genitive case.

- (36) Marija je gledala film sa trojicom pametnih dečaka.  
 Maria is watched movie with three-INST smart-M.PL.GEN boys-M.PL.GEN  
 ‘Maria watched the movie with three of the smart boys.’

### 2.2.3.3. *Mixed collectives*

A special set of numerals – mixed collective numerals – is used when referring to a group of animate subjects (either human or non-human) whose gender is either unknown to the speaker, or the group consists of referents of both female and male sex. These numerals generally modify a specific type of nouns, the so-called collective nouns. These nouns denote a group of individuals that belong to a certain collective entity that acts as a unique whole. For example, for numbers five and above, the collective noun *deca* ‘children’ cannot be modified by a cardinal number, but only by a collective numeral.

- (37)
- a. Dva/ Tri/ Četiri deteta su napravila sneška.  
 two/ three/ four-CARD children-N.SG.GEN are made-N.PL snowman  
 ‘Two/ Three/ Four children made a snowman.’
- b. \*Pet dece je napravilo sneška.  
 five-CARD children-N.PL.GEN is made-N.SG snowman
- c. Petoro dece je napravilo sneška.  
 five-COLL children-N.PL.GEN is made-N.SG snowman  
 ‘Five children made a snowman.’

Unlike masculine collectives, mixed collectives do not decline. The following noun, as well as its modifying adjectives, are genitive plural. The observed agreement on the verb is neuter singular. Semantic agreement is not an option with mixed collectives. This lack of semantic agreement is not so surprising considering the fact that these numerals modify nouns of unknown or mixed gender. Interestingly, a (small) number of native speakers allow for the mixed collective to modify a masculine noun like *dečaci* ‘boys’. In this case, semantic agreement (i.e. masculine plural) on the verb is possible.

- (38) ??Dvoje/Petoro visokih dečaka je igralo/ su igrali fudbal.<sup>20</sup>  
 two/ five.COLL tall.M.PL.GEN boys.M.PL.GEN is played.N.SG/ are played.M.PL football  
 ‘Two/ Five tall boys played football.’

### 2.3. *Interim summary: nominal and verbal agreement with numerals*

Having presented the data, in the next section, I turn to prospective analyses that could account for this diverse behavior of nominal and verbal elements which is triggered by the presence of specific numerals. Before going into existing approaches that address the apparent agreement mismatches involving numeral phrases, I give a summary of agreement patterns observed with each group of numerals.

*Table 7: Agreement with cardinal numbers*

	Gender	Numeral	Adjective <sup>21</sup>	Noun	Verb
1	Masculine	M.SG.NOM	M.SG.NOM	M.SG.NOM	M.SG
	Feminine	F.SG.NOM	F.SG.NOM	F.SG.NOM	F.SG
	Neuter	N.SG.NOM	N.SG.NOM	N.SG.NOM	N.SG
2, 3, 4	Masculine		N.PL.NOM	M.SG.GEN	N.PL M.PL
	Feminine		F.PL.NOM	F.SG.GEN	F.PL
	Neuter		N.PL.NOM	N.SG.GEN	N.PL
5+	Masculine		M.PL.GEN	M.PL.GEN	N.SG M.PL
	Feminine		F.PL.GEN	F.PL.GEN	N.SG F.PL
	Neuter		N.PL.GEN	N.PL.GEN	N.SG N.PL

<sup>20</sup> Constructions of this kind are used only in colloquial speech.

<sup>21</sup> I do not include a separate column for demonstratives, as in terms of features, they behave the same as adjectives.

Numeral 1 agrees with the noun that it modifies in phi-features as well as case features. Unlike other cardinal numbers, numeral 1 does not impose genitive case on the modified noun, and it does not affect verbal agreement. Word order within the nominal domain in terms of numeral – adjective distribution does not affect the forms these elements take, and does not modify the meaning of the sentence. Fronting the adjective (i.e. adjective is preceding the numeral) is used only for the emphatic purposes.

Numerals 2, 3 and 4 modify nouns in their singular forms, imposing genitive case. The modifying adjectives appear in two forms, depending on the gender of the noun in question. If the modified noun is neuter or masculine, the adjective appears in its neuter plural form. If the noun is feminine, the adjective is feminine plural. All the modifying elements are in their nominative forms. The verbal agreement with masculine and neuter nouns is neuter plural, and with feminine nouns it is feminine plural. With masculine nouns, the verbal agreement can optionally be masculine plural (i.e. semantic agreement). Numeral – adjective ordering does not trigger any changes in either form or meaning.

5+ numerals and number noun *sto* ‘hundred’ (but not *stotina* ‘hundred’ and other number nouns which behave like masculine collectives) take plural nouns and force genitive case on them. The modifying adjectives agree with the noun in phi-features and case features. The observed verbal agreement is neuter singular, irrespective of the gender of the modified noun. Alternatively, semantic agreement can occur: masculine plural for masculine nouns, feminine plural for feminine nouns, and neuter plural for neuter nouns. Just like with other cardinals, the adjective – numeral ordering is inconsequential.

The agreement properties of sentential elements with collective numerals, both masculine and mixed ones, depend on the numeral – adjective ordering.

*Table 8: Agreement with collective numerals with respect to numeral - adjective ordering*

	<b>Gender</b>	<b>Numeral</b>	<b>Adjective</b>	<b>Noun</b>	<b>Verb</b>
<b>Masculine collectives</b>	<b>Masculine</b>		M.PL.GEN	M.PL.GEN	N.PL
					M.PL
<b>Mixed collectives</b>	<b>Neuter</b>		M.PL.GEN	M.PL.GEN	N.SG
	<b>Masculine</b>		N.PL.GEN	N.PL.GEN	N.SG

	Gender	Adjective	Numeral	Noun	Verb
<b>Masculine collectives</b>	<b>Masculine</b>	N.PL.NOM		M.PL.GEN	N.PL M.PL
	<b>Masculine</b>	N.SG.NOM		M.PL.GEN	N.SG
<b>Mixed collectives</b>	<b>Neuter</b>	N.SG.NOM		N.PL.GEN	N.SG

Masculine collectives modify only masculine nouns with animate referents. They take nouns in their plural forms and impose genitive case on them. The modifying adjective agrees with the noun in phi-features and case features in cases where the ordering of elements within the NP is numeral – adjective – noun. However, if the adjective precedes the noun (adjective – numeral – noun) the adjective is always neuter plural and bears nominative case. Subtle but nevertheless significant differences in meaning depend on the numeral-adjective ordering. The observed agreement on the verb is neuter plural, with the possibility of semantic agreement (M.PL).

The set of mixed collectives modifies nouns of mixed or unknown natural gender. These nouns, in most cases, belong to a special group of mixed collective nouns that belong to either the neuter or masculine grammatical gender. In the numeral – adjective – noun configurations, the adjective agrees with the noun in case (genitive) and phi-features. If the adjective precedes the numeral it is always in the neuter singular form. The differences in meaning are the same as those with masculine collectives. The agreement on the verb is always neuter singular. Semantic agreement is ruled out for empirical reasons: lack of a unified value for the natural gender of the referents.

### 3. Agreement mismatches with cardinal numbers

In the previous chapter, I presented the relevant data concerning the behavior of sentential elements when a numeral is part of the subject NP and I showed the agreement patterns observed on the verb and the nominal elements. I illustrated that numerals 2, 3 and 4 evoke different agreement mismatches than 5 + numerals, and that masculine collectives and mixed collectives also follow different patterns. In this section I analyze each set of numerals separately and I attempt to account for the observed agreement mismatches by offering a unified account for SC numerals.

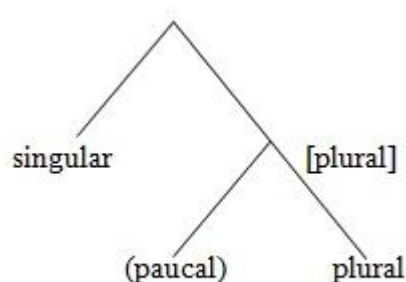
### 3.1. Numerals 2, 3 and 4

I start the analysis by taking a closer look into numerals 2, 3 and 4 as they display the most peculiar behavior, and have received the most attention in the SC literature dealing with numerals. Before offering my own view of these numerals, I first examine the approaches of Zlatić (1997) and Belić (2008). The analyses of Zlatić (1997) and Belić (2008) are both based on the premise that MSC, apart from the singular and plural, has a third number value, namely, minor paucal in Belić's terms, or 234 or dual/paucal remnant in Zlatić's words.

#### 3.1.2. Belić's (2008) minor paucal

Belić (2008) argues that the number system of SC differentiates between three different values – singular, plural and paucal – characterizing paucal as a minor number in Corbett's (2000) terms<sup>22</sup>. Adopting Corbett's (2000) branching tree of binary choices of number values, Belić (2008) proposes the schema in Figure (1) for SC.

Figure 1: Gender in Serbo-Croatian



Belić (2008: 268)

According to Belić, the paucal number appears only on noun phrases following numerals *dva/dve* 'two', *tri* 'three' and *četiri* 'four' and *oba/obe*<sup>23</sup> 'both'. He bases his claims on the different morphological forms that a noun phrase takes in one and the same environment depending on its number value. (Belić, 2008: 259):

<sup>22</sup> In Corbett's (2000: 95) terms, minor number is characterized as "additional values which involve a relatively small portion of the nominals of a given language".

<sup>23</sup> I do not address the form *oba/obe* 'both' separately because it exhibits the exact same behavior as numeral *dva/dve* 'two'.



(39)

- a. Visok muškarac je bio na koncertu.  
tall.SG man.SG is been.SG on concert  
'A tall man was at the concert.'
- b. Dva/ Tri/ Četiri visoka muškarca su bila na koncertu.  
two/ three/ four tall.PA man.PA are been.N.PL on concert  
'Two/Three/Four tall men were at the concert.'
- c. Visoki muškarci su bili na koncertu.  
tall.PL man.PL are been.M.PL on concert  
'Tall men were at the concert.'

The question, however, arises whether the environment in all three sentences in (39) is really the same. The predicate in all three instances is the same, as well as the noun and the adjective. In sentence (39b) there is one obvious difference, namely, the presence of the numeral. Belić attributes the difference in the form of the adjective and the noun to a different number value of these elements. The author disregards the possibility of the nouns being genitive singular because the modified NPs that are quantified by numerals 2, 3 and 4 clearly differ from those that are in the genitive singular (see Table 9).

*Table 9: Paucal versus Genitive singular*

<i>Paucal (2, 3 &amp;4)</i>	<i>Genitive singular</i>
visoka muškarca tall.PA man.PA	visokog muškarca tall.SG.GEN man.SG.GEN
lepe žene beautiful.PA woman.PA	lepe žene beautiful.SG.GEN woman.SG.GEN
prave ljubavi real.PA love.PA	prave ljubavi real.SG.GEN love.SG.GEN
velika ogledala big.PA mirror.PA	velikog ogledala big.SG.GEN mirror.SG.GEN
mala jajeta small.PA egg.PA	malog jajeta small.SG.GEN egg.SG.GEN

Belić (2008: 260)

When looking at the NPs in Table (9) as units, it is evident that those on the left (paucal) differ in form from those on the right (genitive singular). However, upon closer inspection, one notices that it is only the forms of adjectives that differ in the two columns, while the nouns are the same. Thus, speculatively, the nouns might as well be in their genitive singular forms. The adjectives, on the other hand, definitely cannot be. At first glance, this might seem quite peculiar, since the adjectives modify nouns, and in SC they generally show agreement with the noun they modify (i.e. they agree in phi-features and case features). A possible explanation as to why adjectives do not agree with nouns in these configurations might be that they do not modify bare nouns in these cases, but already quantified nouns. Recall that the interpretation of a phrase such as *tri pametna dečaka* ‘three smart boys’ is that there are three boys and these three boys are smart; and not there are smart boys and there are three of them. Taking into account these scopal differences, it is not unnatural to assume that the adjective in fact modifies the already quantified NP, and that as such, it agrees in features with the numeral rather than the noun. In the following sections, I show that this indeed is the case, and that agreement occurs between the numeral and the adjectives. The next question that arises naturally is what the features of the numeral are. I address the feature specification of the numerals in section 3.1.4., where I propose a novel approach to SC numeral phrases.

Another piece of evidence that Belić does not address is that these presumably paucal phrases in the left column never appear in isolation. More specifically, the phrase such as *visoka muškarca* ‘tall man’ is actually an ill-formed phrase. Only when preceded by numerals 2, 3 or 4 does the phrase *visoka muškarca* become well-formed (i.e. *dva/ tri/ četiri visoka muškarca*). This seems to suggest that it is the numeral that dictates the form of the adjective and the noun in question. If this were not the case, and the paucal NPs in the left column indeed could appear without the numeral, it would be expected that *visoka muškarca* should mean that there is between two and four tall men. This, however, is not the case as the phrase is completely ungrammatical.

According to Belić, in configurations involving numerals 2, 3 and 4, the true agreement on the verb occurs: the verb also appears in minor paucal as it agrees with the noun. The claim that verbs in MSC have a special dual or minor paucal form, however, lacks adequate empirical evidence. Taking as an example Slovene, a Slavic language that has a fully-fledged dual number, the weakness of Belić’s claims becomes quite evident. Consider the difference in verbal agreement between the Slovene example in (40) taken from Corbett (2010: 11) and SC examples in (41a-b) with conjoined NPs.

(40) Tonček in Marina sta prizadevn-a  
 Tonček<sub>M</sub> and Marina<sub>F</sub> be<sub>3DU</sub> assiduous<sub>M.DU</sub>  
 ‘Tonček and Marina are assiduous’

(41)

a. Marko i Slavko su igrali fudbal.  
 Marko<sub>M</sub> and Slavko<sub>M</sub> are played<sub>M.PL</sub> football  
 ‘Marko and Slavko played football.’

b. \*Marko i Slavko su igrala fudbal.  
 Marko<sub>M</sub> and Slavko<sub>M</sub> are played<sub>N.PL/PA</sub> football

As can be seen from the example sentences, while Slovene has dual agreement on the verb with conjoined NPs which clearly indicates that there are two referents in question, in SC only masculine plural agreement is possible. An alleged paucal form of the verb (i.e. the form that appears in sentences such as *Dva dečaka su igrala<sub>N.PL</sub> fudbal* ‘Two boys played football’) is out. This goes to show that it is highly unlikely that the verb form found with numerals 2, 3 and 4 is the special dual/ minor paucal verb form.

Another claim that Belić makes is that both singular and plural agreement on the verb is possible with nouns quantified by numerals 2, 3 or 4. According to him, this ability of the numeral phrases involving 2, 3 and 4 to have verbs in either the singular or plural form, goes to show that they indeed are in the paucal. Consider the examples in (42) – (44) from Belić (2008: 262).

(42)

a. Dva/ Tri/ Četiri visoka muškarca su bila na koncertu.  
 two/ three/ four tall<sub>PA</sub> man<sub>PA</sub> are<sub>PL</sub> been<sub>PL</sub> on concert  
 ‘Two/Three/Four tall men were at the concert.’

b. Dva/ Tri/ Četiri visoka muškarca je bilo na koncertu.  
 two/ three/ four tall<sub>PA</sub> man<sub>PA</sub> is<sub>SG</sub> been<sub>SG</sub> on concert  
 ‘Two/Three/Four tall men were at the concert.’

(43)

a. Dve/ Tri/ Četiri lepe žene su bile ovde.  
 two/ three/ four beautiful<sub>PA</sub> woman<sub>PA</sub> are<sub>PL</sub> been<sub>PL</sub> here  
 ‘Two/Three/Four beautiful women were here.’

- b. Dve/ Tri/ Četiri lepe žene je bilo ovde.  
 two/ three/ four beautiful.PA woman.PA is.SG been.SG here  
 ‘Two/Three/Four beautiful women were here.’

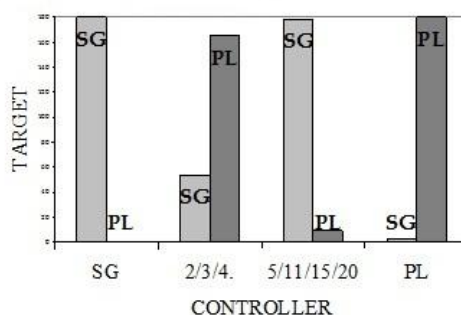
(44)

- a. Dva/ Tri/ Četiri velika ogledala su bila tu.  
 two/ three/ four big.PA mirror.PA are.PL been.PL there  
 ‘Two/Three/Four dig mirrors were there.’

- b. Dva/ Tri/ Četiri velika ogledala je bilo tu.  
 two/ three/ four big.PA mirror.PA is.SG been.SG there  
 ‘Two/Three/Four big mirrors were there.’

The claims Belić makes regarding the possibility of singular agreement on the verb, nevertheless, face some major issues. First, the author bases this claim on the results obtained from a fill-in the gap questionnaire administered to fifteen native speakers of SC. He presents his results in the chart in Figure (2).

**Figure 2: Chart of agreement patterns in Serbo-Croatian**



Belić (2008: 262)

The provided graph, however, is not very revealing as the author fails to provide crucial information. First, Belić does not specify the number of the test sentences. Secondly, he does not state whether the number of ‘verb singular’ hits is significant for 2, 3, 4 sentences. Thirdly, he does not specify whether the singular option is spread around informants and examples, or if only one person used the verb in the singular, or if multiple informants used singular for one specific type of construction. Finally, and most importantly, the author does not mention whether the test sentences included only copular verbs (like the examples (42) – (44) that are provided in the article) or if there were any lexical verbs tested as well. Since

copular verbs lack semantic content, they are derived differently from lexical verbs. This derivational distinction could result in them undergoing different agreement mechanisms, and thus having diverse agreement options.

For examples (42) – (44), it is crucial to note that the only verb used is the copular verb *biti* ‘to be’. The sentences in (a) are not synonymous to their counterparts in (b). While the sentences in (a) mean that a particular number of referents (two, three or four of them) were in a specific place, the ones in (b) have a slightly different meaning. For sentences in (b), some context is necessary. They have more of an existential meaning: “There were two/three/four men/women/mirrors here... (among other people/things)”. A possible way to account for this existential meaning that occurs with singular agreement is to posit some sort of covert expletive pronoun that triggers the observed agreement.<sup>24</sup> With lexical verbs, on the other hand, singular agreement is not possible:

- (45) \*Dve/ Tri/ Četiri lepe žene je peklo kolače.  
 two/ three/ four beautiful.PA woman.PA is.SG baked biscuits

Another problem with treating verb forms in (42b) – (44b) as singular forms of what Belić claims to be agreement with the subject in minor paucal, is the fact that this (neuter) singular agreement is default agreement is SC. In other words it is not clear whether in these examples the observed verbal agreement is an instance of true syntactic agreement, or whether it is default agreement. There are three agreement options available: (i) true syntactic agreement with the subject NP which is in the paucal form; (ii) default agreement; or (iii) syntactic agreement with a covert expletive. The first option is unlikely to be true, since Belić claims that the forms in (42a) – (44a) are paucal forms, and to have two paucal forms for one and the same verb is quite peculiar. The second option is possible, yet quite hard to prove. In the following sections, I use the coordination test to showcase instances of default agreement. In this case, however, the coordination test is not an option, since nouns take paucal forms only when quantified by numerals 2, 3 and 4, and never when they are bare. The third option seems to be the most plausible one, both from syntactic and semantic point of view: agreement occurs with a covert expletive, which corresponds to the existential meaning that these sentences have.

The behavior of verbs in impersonal and weather constructions suggests that neuter is the default gender as the observed agreement on the verb is neuter singular.

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<sup>24</sup> I thank Marjo van Koppen for pointing this out.

(46)

a. Dosadno mi je  
bored.N.SG me.DAT is  
'I am bored.'

b. Grmelo je  
thundered.N.SG is  
'There was a thunder.'

In these constructions, there is no active goal for verbal agreement (46a), or there is no subject at all for the verb to agree with (46b); hence we find a default agreement on the verb – neuter singular. If what we find in (42b) – (44b) is indeed a counterpart of the plural – minor paucal, it is unclear why its form is the same for all three genders when it clearly sets the feminine agreement apart (43a) from the plural agreement. In other words, it is strange that we then do not find feminine singular in (43b). And similarly, masculine singular is not an option for (42b). These gender differences are not discussed in Belić (2008).

### 3.1.3. Zlatić's (1997) 234 form

Zlatić (1997) argues that numerals 2, 3, and 4 behave differently from other numerals in SC in that they impose a special form on the noun that they quantify over – a so called 234 form (Browne, 1993) – a remnant of an old dual or paucal form. Additionally, according to Zlatić, the numerals not only impose a specific form on the noun, but on other elements within the noun phrase (i.e. adjectives and demonstratives) as well. Furthermore, the author suggests that the gender of the modifiers in the NP, as well as that of the numeral itself, is determined by the noun in question. Hence, all the elements in the NP, headed by a noun of feminine gender will thus be feminine and will have the specific 234 number form. The same holds for masculine nouns: all the elements are specified with masculine gender, and 234 number. Consider examples in (47) from Zlatić (1997) illustrating the phenomenon.

(47)

a. Ove dve dobre glumice  
this.F.234 two.F good.F.234 actresses.F.234  
'these two good actresses'

b. Ova dva dobra glumca  
 this.M.234 two.M.234 good.M.234 actors.M.234  
 ‘these two good actors’

(Zlatić, 1997: 95)

Zlatić thus concludes that the gender of the modifying elements comes from the noun, while the number comes from the numeral. However, while the modifying elements in (47a) are indeed unquestionably feminine, the status of those in (47b) is not as clear. There is no other context, besides this one, in which *ova* ‘these’ could refer to a masculine noun, irrespective of its number. Similarly, adjective *dobra* ‘good’ cannot modify a masculine noun beyond this context, either (e.g. \**ova dobra glumc* ‘these good actors’). *Ova* and *dobra* are, however, perfectly suitable for modifying neuter nouns.

(48) Ova dobra deca  
 this.N.PL good.N.PL children.N.PL  
 ‘these good children’

Zlatić further suggests that numerals 2, 3 and 4 actually induce true agreement on the verb. That is, that the verb is also in a specific 234 form.

(49)

- a. Dva srpska glumca su otišla/ %otišli  
 two.M.234 serbian actors AUX.3.PL left.234/ left.M.PL  
 ‘Two Serbian actors left.’
- b. Dve srpske glumice su otišle.  
 two.F.PL serbian actresses.F.PL AUX.3.PL left.3.F.PL  
 ‘Two Serbian actresses left.’

(Zlatić, 1997: 99)

When the numeral modifies a masculine noun, the agreement on the auxiliary is plural, and on the participle 234, suggesting that it is the numeral and not the noun that determines the number feature of the predicate. According to the native speakers Zlatić consulted, masculine gender on the participle is also allowed, which thus suggests that the agreement can actually also be induced by the quantified noun and not the numeral. On the other hand, when the

numeral modifies a feminine noun, only feminine plural agreement on the participle is allowed, indicating again that it is the quantified noun and not the numeral that heads the phrase. The summary of features of the sentential elements is provided in the Table (10).

*Table 10: Feature specification with numerals 2, 3 and 4 according to Zlatić (1997)*

	Numeral	Adjective	Noun	Verb
Masculine	M.234	M.234	M.234	M.234/M.PL
Feminine	F.PL	F.234/F.PL	F.234/F.PL	F.PL

Although the analysis of Zlatić (1997) seems plausible, it faces some theoretical and empirical problems. First, this dual behavior of the numerals 2, 3 and 4 in terms of verbal agreement is quite curious, and as such, it requires thorough discussion. The author, however, does not address the question of where these differences stem from. Zlatić’s account implies that in cases with masculine nouns, it is the numeral that determines the number feature of the predicate (i.e. 234 form), whereas in the cases with feminine nouns, it is the quantified noun that determines the verbal agreement (i.e. feminine plural). This is quite strange considering the fact that Zlatić claims that numerals 2, 3, and 4 “behave like governing quantifiers, imposing a specific form on the following noun phrase” (Zlatić, 1997: 95) – a 234 form. Recall example (47a) taken from Zlatić (1997) in which she treats the feminine noun *glumice* ‘actresses’ modified by the numeral 2 (i.e. *dve*) as being in its 234 form. If in the feminine cases it is indeed the noun that determines the number feature of the predicate, it is unclear how the induced verbal agreement is feminine plural if the noun is in the specific 234 form. It is possible that Zlatić made a rather serious notational mistake, and the noun and all the modifiers in (47a) should not be in the form of 234. This is however hardly conceivable since she never makes the distinction between the form of the feminine nouns on the one hand, and masculine and neuter on the other. A possible explanation for Zlatić’s alternating notation for adjectives and nouns of feminine gender (F.234 versus F.PL) could be the fact that these forms are syntactically indeed 234, but surface as plurals due to the lack of a morphological 234 form.<sup>25</sup> The author does not clearly explain this. Furthermore, Zlatić never discusses the cases of neuter nouns, and their obvious parallelism with masculine nouns. Interestingly, in the masculine example (49a), Zlatić treats the auxiliary verb as third person plural, whereas the main verb she considers to be in the 234 form. Most importantly, this 234 form is rather

<sup>25</sup> I thank Heidi Klockmann for bringing up this possibility.



vaguely described: what exactly is this form in terms of features? Is it a number feature? Is it also specified for case? These questions are never addressed in Zlatić’s (1997) analysis.

### 3.1.4. Novel approach to numerals 2, 3 and 4 in Serbo-Croatian

Having shown in the previous sections that the assumption of MSC having a third number value – dual/minor paucal, faces some theoretical and empirical problems, I now turn to my own proposal regarding numerals 2, 3 and 4. At this point, it is still unclear what the forms of nouns in these configurations are and what the forms of the numerals themselves are. The first question I address is what the feature specifications of the numerals are. More specifically, I examine the number specification of the numeral (i.e. is it inherently singular or plural); and the gender specification of the numeral (i.e. is it feminine versus masculine/neuter). I then show that the nouns modified by these numerals are actually in their singular forms. Each question is addressed in turn.

Inspecting the verbal agreement with *singularia tantum* nouns (i.e. nouns that do not have plural forms, but are yet grammatically countable) modified by numerals 2, 3 or 4 can give insight into the number feature of the numeral. Compare the verbal agreement of the sentences in (50) featuring a SC *singularia tantum* noun *luk* ‘onion’.

(50)

- a. Luk                    je        istrulio.  
    onion<sub>M.SG.NOM</sub> is        rotten<sub>M.SG</sub>  
    ‘Onion got rotten’
- b. \*Luk                    su        istrulili.  
    onion<sub>M.SG.NOM</sub> are rotten<sub>M.PL</sub>
- c. Dva    luka                    su        istrulila.  
    two    onion<sub>M.SG.GEN</sub> were rotten<sub>N.PL</sub>  
    ‘Two onions got rotten.’

In (50a), the verbal agreement of the participle is singular, agreeing in number features with the *singularia tantum* noun. When a *singularia tantum* noun is modified by a numeral, the verbal agreement should stay unchanged (i.e. singular) since the noun cannot have a plural form. Observe that in (50c) the verb *istruliti* ‘to rot’ is actually in the plural form, even

though the noun *luk* ‘onion’ is in the singular. This observation suggests that it is the numeral that induces this change in the number feature of the participle. The verb as a probe has two prospective goals to agree with – the noun and the numeral. If it were to agree with the noun in this case, the number feature of the verb would have to be singular. Since this is not the case, it must be the numeral that dictates the number feature of the verb. The observed behavior in terms of verbal agreement thus indicates that the numeral must be inherently plural. Additionally, the fact that 2, 3 and 4 can modify *singularia tantum* nouns goes to show that these numerals actually take nouns that are in their singular forms, and not the speculated 234/ dual/ minor paucal forms: *singularia tantum* nouns have only singular forms. A similar test can be done with *pluralia tantum* nouns (i.e. nouns that only appear in plural and do not have a singular form for referring to a singular object). One such noun is *makaze* ‘scissors’. Consider the examples in (51) in which a *pluralia tantum* noun is modified by numeral 2.

(51)

- a. Makaze            su    otupele.  
 scissors.F.PL.NOM are    blunt.F.PL  
 ‘The scissors got blunt.’
- b. \*Makaze            je    otupela  
 scissors.F.PL.NOM is    blunt.F.SG
- c. \*Dve makaze/            makaza  
 two    scissors.F.PL.NOM/    scissors.F.PL.GEN
- d. Dva    para            makaza            su    otupela.  
 two    pair.M.SG.GEN scissors.F.PL.GEN is    blunt.N.PL  
 ‘Two pairs of scissors got blunt.’

Note first that the bare *pluralia tantum* noun *makaze* ‘scissors’ cannot be modified by the numerals 2, 3 or 4. In order for it to be quantified, the noun *par* ‘pair’ has to be inserted between the noun and the numeral. This behavior speaks in favor of the claim that numerals 2, 3 and 4 only quantify over nouns that are in their singular forms. Secondly, the neuter plural features on the verb show that the agreement cannot be occur with either *makaze* or *par*. If the verb agreed with *makaze*, its form would have been the same as that in (51a) (i.e. F.PL). If it agreed with *par*, the verb form would reflect the features of the modifier noun (i.e. M.SG). This is exactly what happens when the numeral is left out.

- (52) Par makaza je otupeo.  
 pair.M.SG.NOM scissors.F.PL.GEN is blunt.M.SG  
 ‘A pair of scissors got blunt.’

The only goal left for the verb to agree with is thus the numeral. The reason why the features on the verb in (50c) are neuter plural is due to the fact that the head of [<sub>NPP</sub>par makaza] is *par* ‘pair’ which is specified with masculine gender, and not the noun *makaze*. This observation brings us to the second question – namely, what the gender specification of the numeral is.

When it comes to gender features of these numerals, for numeral 2 it is clear that a difference exists between the feminine form (i.e. *dve*) and the neuter/masculine form (i.e. *dva*). For numerals *tri* ‘three’ and *četiri* ‘four’, such a distinction is not as obvious, since the feminine form is not morphologically marked. Nevertheless, the verbal agreement observed with numerals 3 and 4 follows the pattern of 2.

(53)

- a. Dve devojčice su plivale.  
 two girls.F.SG.GEN are swum.F.PL  
 ‘Two girls swam.’
- b. Dva dečaka/ deteta su plivala.  
 two boy.M.SG.GEN/ child.N.SG.GEN are swum.N.PL  
 ‘Two boys/children swam.’

(54)

- a. Tri/ Četiri devojčice su plivale.  
 three/ four girls.F.SG.GEN are swum.F.PL  
 ‘Three/Four girls swam.’
- b. Tri/ Četiri dečaka/ deteta su plivala.  
 three/ four boy.M.SG.GEN/ child.N.SG.GEN are swum.N.PL  
 ‘Three/Four boys/children swam.’

Note that the verbal features in (53a) with a feminine noun quantified by the numeral 2 matched those observed in (54a) where the same noun is quantified by 3 and 4. The same goes for masculine and neuter nouns, both of which induce neuter plural agreement on the verb with numerals 2, 3 and 4. Assuming the features of the numeral to be [number: plural] and [gender: feminine] or [gender: masculine/neuter], it agrees in both number and gender

features with all the modifying nominal elements, as does the verb in feminine examples in (a) and neuter ones in (b). In the cases in (b) with masculine noun *dečak* ‘boy’ it should thus be expected for the verbal agreement to be masculine plural. This is, however, not the case as the verb is neuter plural. The examples above suggest that it is the numeral that triggers these number and gender changes in both the nominal and verbal domain. This happens via operation Agree, as I argue below. Recall that in the cases with masculine nouns, all nominal modifiers, as well as the verb, change into neuter. I thus suggest that the gender distinction of the numerals 2, 3 and 4 should be feminine versus neuter, with a lacking masculine form.

Another hint that seems to suggest that the feminine versus neuter/masculine distinction of numeral 2 should be extended to 3 and 4 is the possibility of these numerals to express dative case but only with feminine nouns. Recall from Table 4 that, as opposed to masculine and neuter nouns, feminine nouns modified by numerals 2, 3 and 4 decline in the dative. The form for two – *dvema*.<sub>DAT</sub> is perfectly acceptable, three – *trima*.<sub>DAT</sub> a little less so, and four – *četrima*.<sub>DAT</sub> is a borderline case. For all numerals above 4, the dative case is not an option, suggesting that the feminine versus masculine/neuter distinction has not spread to numerals 5+, which is congruent with their observed behavior.

I therefore assume the feature specification of the numerals 2, 3 and 4 to be the following: [number: plural] – inherently valued and [gender: feminine] or [gender: neuter] – valued via Agree with the noun. The assignment of the gender feature to the numeral via Agree with the noun rules out the possibility of, for example, feminine nouns merging with neuter numerals. The natural questions to ask under this assumption are: (i) why is there a distinction between feminine and neuter numerals with a lacking form for masculine; and (ii) why does the masculine noun take a neuter numeral and not a feminine one?

There are two indications that seem to suggest that the gender distinction of the numeral should be feminine versus neuter, with “a gap” for the masculine form. First and foremost, there is an obvious parallelism between the neuter forms of nominal and verbal elements and the forms these elements take in numeral constructions: they are indistinguishable. If it is the case that the forms in question are dual in nature (i.e. the same for masculine and neuter) why is it that they are identical to neuter forms, and not masculine ones?

Secondly, masculine is the only gender in SC that has a set of collective numerals at its disposal. These numerals directly signal that the following noun will denote a group of

male human referents. Interestingly, certain native speakers of SC have a preference for a collective numeral to modify a masculine noun instead of a cardinal number:

(55)

- a. ?Dva dečaka su igrala tenis.  
two<sub>CARD</sub> boys are played tennis  
'Two boys played tennis.'
- b. Dvojica dečaka su igrala tenis.  
two<sub>COLL</sub> boys are played tennis  
'Two of the boys played tennis.'

The fact that there is no set of collective numerals that can modify nouns of neuter and feminine gender can be interpreted as a signal that these two genders are already present in the available set of cardinal numbers. As for modifying masculine nouns, the language has to resort to another strategy – i.e. utilization of a collective numeral.

Adopting the assumption that a distinction exists between feminine and neuter numerals, with a lacking masculine form, the question that still requires addressing is why masculine nouns take neuter numerals as their modifiers, and not feminine ones. To go about answering this question, one can resort both to theoretical and empirical cues. The notions of natural and grammatical gender are essential for the present discussion. Grammatical gender refers to a system according to which nouns can be classified. Each noun is inherently specified with a gender value – in SC, that is masculine, feminine or neuter. Natural gender, on the other hand, refers to the gender class to which the noun belongs based on the sex of its referent. Crucially, the two genders (i.e. grammatical and natural), as already stated, do not necessarily coincide. For example the SC word *devojče* ('girl' in diminutive – 'little girl') is specified with neuter grammatical gender, even though its referent is obviously feminine. According to my knowledge, in SC, there are no nouns with feminine referents that are specified with masculine grammatical gender, or the other way around. Grammatical/natural gender mismatch only occurs between masculine or feminine on the one hand and neuter on the other. (Animate) nouns bearing neuter grammatical gender can either be feminine or masculine in their natural gender. Hence, it is not unnatural to assume that a masculine noun, that is to be modified with a numeral which only makes a feminine - neuter distinction, will select for a neuter form, rather than feminine. Ultimately, the neuter form is more “neutral”.

In addition to this, recall that the behavior of verbs in impersonal and weather constructions suggests that neuter singular is a default agreement in SC. Following that logic, it is not unnatural to assume that neuter is thus the default gender in SC. This leads to the conclusion that masculine nouns, due to the lack of masculine form of the numeral, have to make use of the available options; namely feminine and neuter forms, and that they will chose the latter. This is because (a) neuter is less specific (i.e. more “neutral), and (b) neuter is a default in SC.

The feature specification of all sentential elements involving the presence of numerals 2, 3 or 4 is presented in Table (11).

*Table 11: Feature specification of sentential elements*

<b>Gender</b>	<b>2, 3, 4</b>	<b>Adjective</b>	<b>Noun</b>	<b>Verb</b>
<b>Masculine</b>	N.PL.NOM	N.PL.NOM	M.SG.GEN	N.PL M.PL
<b>Feminine</b>	F.PL.NOM	F.PL.NOM	F.SG.GEN	F.PL
<b>Neuter</b>	N.PL.NOM	N.PL.NOM	N.SG.GEN	N.PL

In order to account for the forms in Table (11), four specific questions require addressing: (i) why do the modifiers agree with the numeral and not the noun; (ii) where does the genitive case on the noun come from; (iii) why is the observed verbal agreement that of the numeral, too; and (iv) why does semantic agreement optionally occur?

The answers to the first two questions come in tandem. Namely, the reason why the adjectives fail to agree with the noun, and subsequently agree with the numeral, is first, because the noun is inactive due to the genitive case that it receives from the numeral, and secondly, because there is an intervening head (i.e. the numeral) preventing the adjectives to reach the noun.<sup>26</sup> This is in line with Franks’ (1994) claim that quantifiers in SC are inherent genitive case assigners. I follow the approach of Klockmann (2012) who claims that numerals in Polish assign genitive case to the noun they quantify.<sup>27</sup> Klockmann uses partitives as

<sup>26</sup> Marjo van Koppen (p.c.) brings up the possibility that genitive case on the noun comes as a kind of ‘rescue’ for the derivation. Namely, since there is an intervening head – the numeral, between the case assigner (i.e. T head) and the noun, the noun cannot get nominative. Under this account, genitive case occurs at a later point in the derivation, and not right after the numeral is merged on top of the noun as suggested in Klockmann (2012) and as adopted in the present approach in which genitive case is an inherent assigning property of numerals.

<sup>27</sup> Specifically, Klockmann (2012) shows that in Polish, only 5+ numerals are genitive case assigners. Numeral 1, and 2, 3 and 4, in some instances (in the cases of masculine human gender, 2, 3 and 4 optionally assign

similar constructions to noun-numeral constructions to show that numerals have the ability to assign genitive to the noun. Consider the English and Polish examples in (56) from Klockmann (2012: 59).

(56)

- a. Three of the girls were sleeping.
- b. Trzy z dziewczyn spaly  
 three from<sub>[GEN]</sub> girl<sub>.F.PL.GEN</sub> slept<sub>.NON-VIR.PL</sub>  
 ‘Three of the girls slept.’

In the English partitive construction in (56a), there is a preposition between the numeral and the noun which assigns genitive to the noun. Similarly, in the Polish example in (56b), there is a genitive assigning element intervening between the numeral and the noun, responsible for the case marking of the noun. In non-partitive examples involving numeral – noun constructions in Polish, Klockmann proposes that this genitive assigner is covert. Interestingly, partitive constructions in SC may only be formed with numeral 1.

(57)

- a. \*Tri od devojaka su spavale.  
 three of<sub>[GEN]</sub> girls<sub>.F.PL.GEN</sub> are slept<sub>.F.PL</sub>
- b. Tri devojke su spavale  
 three girl<sub>.F.SG.GEN</sub> are slept<sub>.F.PL</sub>  
 ‘Three girls slept.’
- c. Jedna od devojaka je spavala.  
 one of<sub>[GEN]</sub> girls<sub>.F.PL.GEN</sub> is slept<sub>.F.SG</sub>  
 ‘One of the girls slept.’
- d. Jedna devojka je spavala.  
 one girl<sub>.F.SG.NOM</sub> is slept<sub>.F.SG</sub>  
 ‘One girl slept.’

This observation is not so surprising since numeral 1 is the only numeral that does not impose genitive case on the modified noun. So, whereas for numeral 1, the preposition needs to be

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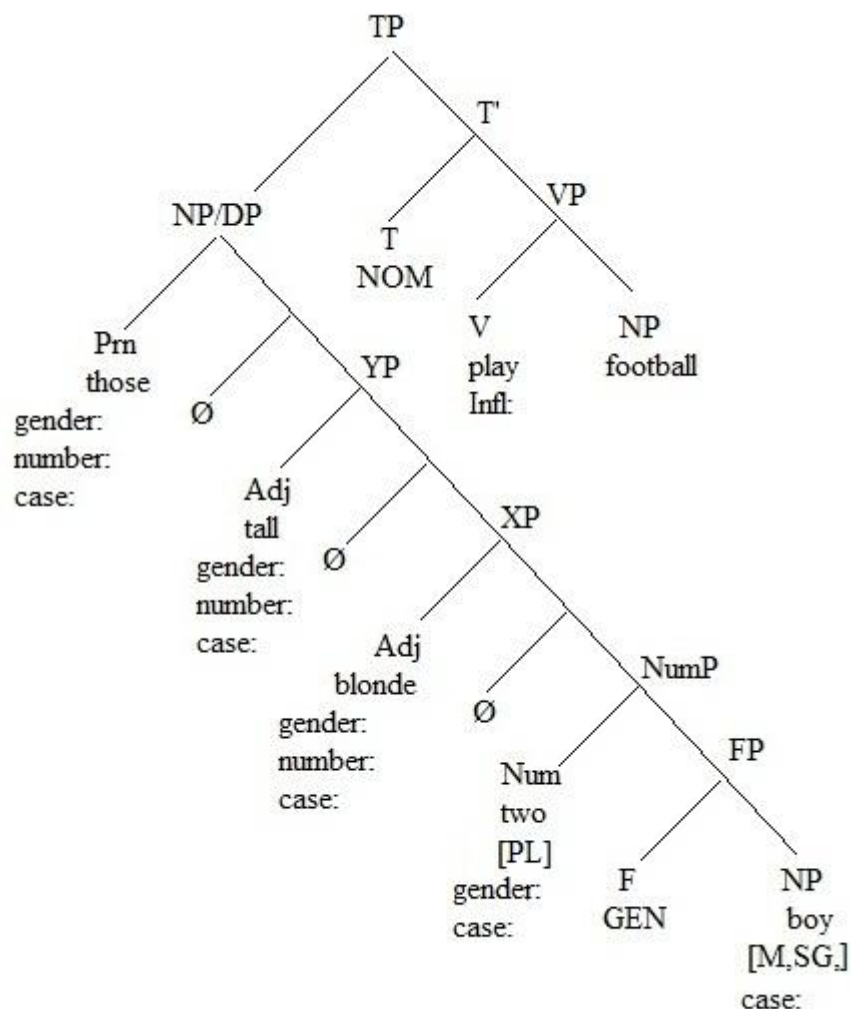
genitive), fail to do so because they are defective (i.e. they do not have a full set of phi-features). I show in the following sections that all numerals in SC, apart from numeral 1, have the ability to assign genitive to the noun.

overt in order to assign genitive, for cardinal numbers 2, 3 and 4, the genitive assigner is always covert. I further discuss the case of numeral 1 in section 3.3.

Having established the source of the genitive case marking on the noun, let us look at the derivation of a sentence with a noun quantified with 2, 3 or 4 in the subject position. See Figure (3).

- (58) Ta dva visoka plava dečaka su igrala fudbal.  
 those.N.PL.NOM two.N.PL.NOM tall.N.PL.NOM blonde.N.PL.NOM boy.M.SG.GEN are played.N.PL f.  
 ‘Those two blonde boys played football.’

Figure 3: Derivation of the sentence in (58) before the numeral raises



The noun ‘boy’ enters the derivation with its gender and number features specified, and an unvalued case feature. The numeral, which inherently carries plural number features, and



unvalued gender and case features, is merged next as a head of its own projection, with an intervening F head that is responsible for the genitive case assignment to the noun. The reason why the numeral is merged this low has to do with the scope of the modifying adjectives discussed in section 2.2.2.3. Agreement happens between the noun and the numeral and the numeral gets its gender feature valued. The numeral does not get masculine gender feature because it cannot recognize it on the noun, and ultimately gets neuter because of the reasons discussed previously. At this point, the noun gets its case features valued, and becomes inactive for Agree. The numeral, on the other hand, is still active as its case feature is unvalued. All the modifying adjectives and the demonstrative are merged as specifiers of individual projections (e.g. Cinque, 1994). All of their phi-features, as well as case features are unvalued. They probe down (presumably to agree with the noun), but they encounter an intervening head (i.e. the numeral) and cannot reach any further. The only other suitable goal for the modifiers to agree with is the numeral itself; hence their features match those of the numeral. By virtue of the fact that it is now the highest active head (case being still unvalued), the numeral is a suitable goal for the verbal agreement, and the operation Agree can apply. The numeral, together with the adjectives, get nominative case from T, and consequently, the verb gets neuter plural from the numeral. Eventually, the numeral moves into one of the higher projections via head-movement deriving the word order in (57). The numeral, being a quantifying expression, moves upwards for scopal reasons.

The question, however, still remains regarding the optionality of semantic agreement with a masculine noun. First, I would like to propose that semantic agreement is not an option just for masculine nouns, but with feminine and neuter, as well. The reason why semantic agreement for neuter and feminine nouns is not obvious is because it is indistinguishable from the observed syntactic agreement. Namely, with neuter and feminine nouns, the syntactic agreement is neuter plural and feminine plural, respectively. For masculine nouns, however, the syntactic agreement is neuter plural, making the semantic – masculine plural – agreement evident.

### **3.2. Numerals 5+**

The peculiar behavior of 5+ numerals has presented a great puzzle for authors interested in numeral agreement (e.g. Corbett 1978, 1983; Franks 1994, 1995; Giusti & Leko 1995; Zlatić 1997). The one thing that all the existing analyses have in common, though, is

the features found on the noun, the modifiers and the verb. That is, the features of the elements in the nominal domain, and the verbal agreement are not at dispute with 5+ numerals. The modifiers agree with the noun in phi-features and case features. The agreement on the verb is default – neuter singular, with some native speakers allowing semantic (plural) agreement.

Similarly to the proposed approach to numerals 2, 3 and 4, I assume that the reason why Agree does not happen between the noun and the verb is because the noun is inactive, and thus cannot be a suitable goal for the verbal probe. The reason why numerals 5+ cannot serve as goals for verbal agreement is the fact that they are defective<sup>28</sup> – that is, they do not have a full set of phi-features. They have an unvalued number feature, and lack the gender feature. For this reason they cannot enter into Agree with the verbal probe, hence default agreement occurs (Preminger, 2011). This is also the reason why the modifying adjectives do not show agreement with the numeral. The question that arises then concerns the apparent agreement between the noun and the modifying adjectives. In other words, if the noun is inactive and cannot agree with the verb (hence, default agreement), why does it agree with the adjective. I offer argumentation for the observed behavior below.

However, a possibility, one could argue, is that just as 2, 3 and 4 are inherently specified with [number: PL] and an unvalued gender feature, numerals 5+ are specified with [number: SG] and [gender: N], which are the features observed on the verb. If that indeed were the case, the adjectives would also be expected to be marked neuter singular, which does not happen. A way to go about this, and postulate the feature specification of the numeral [N, SG], while having adjectives agree with the noun, would require the proposed organization of the elements in the nominal domain presented in Figure 3 to be revised. Namely, it would require the adjectives to be merged on top of the noun, before the numeral and the genitive assigning head. This would, however, be quite problematic for both empirical and theoretical reasons. First, the scope of the modifying adjectives would not support this configuration; and secondly it would not allow for a unified account of SC cardinal numbers. A more adequate and elegant explanation would be to assume that cardinal numbers only differ in their inherent feature specifications, rather than to postulate that they

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<sup>28</sup> Klockmann (2013) introduces the notion of defectiveness for Polish numerals.

are differently derived. Additionally, coordination of two NPs quantified by a 5+ numeral show that the numeral cannot be the source for verbal agreement.<sup>29</sup>

(59)

- a. Mače                    i        pile                                    su trčali        po dvorištu.  
kitten.N.SG.NOM    and    chicken.N.SG.NOM    are run.M.PL    at    yard  
‘A kitten and a chicken ran around the yard.’
- b. Pet    mačića                    i        pet    pilića                                    je trčalo        po    dvorištu.  
five    kittens.M.PL.GEN    and    five    chickens.M.PL.GEN    is run.N.SG    at    yard  
‘Five kittens and five chickens ran around the yard.’

Note that in (59a), the coordination of two neuter nouns gives masculine plural features on the verb. The expected features on the verb would be neuter plural rather than masculine plural. I will not go into details here as to why the observed agreement is masculine plural. I address coordinated NPs in Chapter 5. For the purposes of the present discussion, it is enough to show that the coordination of two neuter singular nouns does not trigger neuter singular agreement on the verb. If we suppose that numerals 5+ are indeed inherently neuter singular, that would then result in the feature marking on the verb in (59b) as masculine plural. This does not occur, as the observed marking on the verb is neuter singular, suggesting that default agreement occurs, instead of the verb agreeing with the numeral.

I, thus, suggest, that numerals 5+ are feature-defective: they have unvalued number features, but are missing gender features. The reason I assume 5+ numerals to be lacking a gender feature is the fact that, unlike 2 – which takes different morphological forms when modifying nouns of different genders – and 3 and 4, which also show gender differences on the modifying adjectives (which I have shown modify the NumP), 5+ numerals do not show these properties. Namely, there is only one morphological form for them, and the adjectives, although they modify the already quantified noun, show agreement with the noun, and not the numeral. Therefore I consider the numerals 5+ to be specified solely with a number feature, which gets valued as plural via agreement with the noun.

The reasons for treating the number feature on the 5+ numerals as plural are both theoretical and empirical in nature. The behavior of singularia and *pluralia tantum* nouns

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<sup>29</sup> Klockmann (2012) uses a coordination test to show that 5+ numerals cannot be targets for verbal agreement in Polish.

modified by 5+ numerals seems to suggest that the numeral might require the plurality of the noun that it modifies. Namely, 5+ numerals cannot modify *singularia tantum* nouns (*\*pet luka* ‘five onions<sub>singularia tantum</sub>’) which is consistent with the claim that these numerals only take nouns in their plural forms. To express the meaning of five onions, one would have to insert some kind of plural marker between the numeral and the noun, e.g. *pet glavica luka* ‘five onion bulbs’. On the other hand, 5+ numerals are suitable modifiers of *pluralia tantum* nouns: *pet makaza* ‘five scissors<sub>pluralia tantum</sub>’. Note that, unlike numerals 2, 3 and 4, which require a singular noun *par* ‘a pair’ to be inserted before the *pluralia tantum* nouns (*dva para makaza* ‘two pairs of scissors, *\*dva makaza* ‘two scissors), for 5+ numerals, this is not necessary. This goes to show that 5+ numerals only modify nouns in their plural forms. Speculatively, the fact that the noun is necessarily in the plural could mean that it imposes the plural on the numeral, too. One might wonder, however, why the same mechanism does not get employed with 2, 3, 4 numerals, where the numeral is in the plural, while the quantified noun is always in its singular form. Numerals 2, 3 and 4, as I have argued, enter the derivation with their number features inherently valued. On the other hand 5+ numerals are feature-defective, that is, they are specified with unvalued number features only. Presumably, these number features of the numeral could be valued by the noun as plural. With 2, 3, 4 numerals this cannot happen since the number features on the numerals are already inherently valued as plural, and the noun is necessarily in the singular; hence the mismatch between the noun’s and numeral’s number feature.

Unlike the adjectives in 2, 3, 4 numeral phrases, adjectives in 5+ numeral phrases bear genitive case on a *par* with the noun, suggesting, again, that they cannot be agreeing with the numeral. If the adjectives were to agree with the numeral, their genitive marking would be unexpected.

Thus, the derivation of a sentence like that in (60) proceeds in the following manner.

- (60) Tih                    pet visokih            plavih                    dečaka            je igralo            fudbal.  
 those.M.PL.GEN five tall.M.PL.GEN blonde.M.PL.GEN boys.M.PL.GEN is played.N.SG football  
 ‘Those five tall blonde boys played football.’

The noun *dečaka* ‘boys’ enters the derivation with its gender feature specified as masculine, and number feature as plural. It has an unvalued case feature. The numeral 5 is merged on top of it, with an intervening head F which assigns genitive to the noun. The numeral, although feature defective, still has unvalued number feature which is valued as plural via agreement

with the noun. Once the number feature on the numeral gets valued, it's defectiveness surfaces, and it is no longer a suitable goal for neither adjectival nor verbal probe. All the modifiers are merged on top of the numeral – all of them with unvalued phi-features and case features. The numeral, being feature defective (i.e. lacking a gender feature) is not a suitable goal for the adjectives to probe for, hence Agree cannot happen. The only other nominal element that could possibly value the phi-features of the adjectives is the noun which is presumably inactive as it has all its features valued. However, according to Chomsky (2000, 2001) feature deletion takes place once the phase is built up and sent to PF suggesting that the features on the noun are still in play. It is thus not unnatural to assume that although the noun has all its features valued, it still has the ability to enter into agreement with the adjectives, as a Last Resort in order to save the derivation. In other words, among two prospective goals, both of which are supposedly unfit for Agree – the numeral because it is feature defective, and the noun because it has all its features valued – the adjectives choose “the lesser of the two evils” and agree with the noun taking its phi-features and case features in the process.<sup>30</sup> The reason why I assume the noun to be a more felicitous goal for the adjectives to agree with is because, unlike the numeral, it can value all their unvalued features simultaneously. The phase has been built up successfully and the features are deleted. At the point at which T is merged into the structure, the only remaining active goal for verbal agreement is the numeral as it still has unvalued case feature. Nevertheless, its feature defectiveness prevents the numeral from entering into agreement with T. Unlike in the cases with 2, 3, 4, the numeral head, due to its defectiveness does not intervene, and the verb can probe further down and reach the noun to agree with. The noun, having all its features valued and deleted is inactive and unsuitable for verbal agreement. Thus, the operation Agree is attempted, but unsuccessful; hence default neuter singular features are inserted on the verb. As the attempted agreement between the numeral and T has failed, the numeral is still caseless, as it did not get nominative from T. Following Klockmann (2012), I suggest that numerals 5+ get default case in the process of default agreement.

In SC, just like in Polish, the default case seems to be nominative, which is exactly the case marking observed on the numeral. In English, on the other hand, the default case is

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<sup>30</sup> A natural question to ask is why this kind of agreement does not happen with 2, 3 and 4. That is, why is it that the adjectives agree with the numeral and not the noun like proposed for 5+ numerals, when the noun is in the same state, so to say, in both derivations? The answer is quite intuitive: with numerals 2, 3 and 4, this Last Resort technique does not have to be employed, as there is an active goal (i.e. the numeral) for the adjectives to agree with.

accusative. Consider the Polish and English examples in (61) and (62) from Klockmann (2012: 67) and their equivalents in SC.

(61)

- a. Me? I don't feel like going today.
- b. Ja? Nie chce mi się iść dzisiaj  
I<sub>NOM</sub> no want I<sub>DAT</sub> REFL to.go today  
'Me (lit. I)? I don't feel like going today.'
- c. Ja? Meni se nie ide danas.  
I<sub>NOM</sub> I<sub>DAT</sub> REFL not go today  
'Me (lit. I)? I don't feel like going today.'

(62)

- a. John and me went to the cinema.
- b. Jan i ja/\*mnie poszliśmy do kina.  
John<sub>NOM</sub> and I<sub>NOM/\*ACC</sub> went to cinema  
'John and me went to the cinema.'
- c. Jovan i ja/\*mene smo otišli u bioskop.  
John<sub>NOM</sub> and I<sub>NOM/\*ACC</sub> are went in cinema.  
'John and me went to the cinema.'

Note that SC behaves exactly like Polish in that it uses nominative in questions referring to one's self (61) (the test is first introduced by Schütze (1997)). In addition to this, unlike English, it does not allow for accusative marking on the second conjunct in coordinated subjects. I thus conclude that nominative is the default case in SC, and as such, it is the only case that can appear on the 5+ numerals. This claim is in line with Zlatić's statement that these numerals are 'frozen in form' (1997: 73), as they lack phi-features.

The same structure and syntactic operations are assumed for indeclinable number nouns (e.g. *sto* 'hundred', but not *stotinu*).

### 3.3. Numeral 1

As already shown, numeral 1 exhibits a true adjective-like behavior as it agrees with the noun that it modifies in phi-features. Interestingly, as opposed to other cardinal numbers,

numeral 1 does not have the ability to assign genitive. This inability, I suggest, is due to the lack of any inherent features on this numeral. Namely, unlike 2, 3 and 4 which enter the derivation with already specified gender (F or N) and number features (PL), and numerals 5+ which are inherently plural, and a missing gender feature; numeral 1 – just like adjectives – enters the derivation with all its features unvalued.

Additionally, as I have shown in the section 3.1.4, 1 is the only numeral that requires an overt preposition in partitive constructions which obligatorily have nouns in genitive. It thus seems that with numeral 1, this genitive assigning F projection needs to have an overt element sitting in its head position in order for it to be able to case-mark the noun. I thus treat numeral one as any other adjective head, with no F projection. In the course of the derivation, the numeral, together with all the modifying adjectives agrees with the noun in phi-features, and are cased via agreement with T, hence the true agreement on the verb.

#### **4. Agreement mismatches with collective numerals**

Unlike cardinal numbers which have an absolute meaning, collective numerals have more of a partitive meaning. That is, the difference between *pet dečaka* 'five.CARD boys' and *petorica dečaka* 'five.COLL boys' lies in the fact that while the former states that there is a total of five boys, the latter indicates that there is a number of boys (greater than 5) out of which five have been singled out. Additionally, collective numerals in SC can serve to specify the gender of the group they quantify over: while masculine collectives (e.g. *dvojica* 'two (males)') refer to a group of males, mixed collectives (e.g. *dvoje* 'two (mixed gender)') indicate a group of referents of both genders (Kim, 2011).<sup>31</sup> These numerals also trigger agreement mismatches (Meillet & Vaillant, 1952). In section 4.1., I discuss masculine collectives and I propose that these numerals have inherently valued number features and unvalued gender features which are always valued as neuter and reflect the markings encountered on the verb. The following section (4.2.) is dedicated to mixed collectives, which I claim lack gender features and cannot enter into agreement with T, hence the occurrence of default agreement.

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<sup>31</sup> Kim (2011) also claims that cardinal numbers do not have this ability. However, this is not entirely true, as numeral 2 obviously makes a distinction between feminine and neuter/masculine in terms of the form it takes when it modifies the nouns of the respective genders.

#### 4.1. Masculine collectives

Masculine collectives, just like all other numerals in SC, apart from the numeral 1, impose genitive case on the quantified NP, whose features are thus always [gender: M], [number: PL] and [case: GEN]. The modifying adjectives, however, present a puzzle. If they follow the numeral, they show agreement with the noun. On the other hand, if they precede the numeral, they are always neuter plural. This agreement behavior of adjectives is not surprising, considering the fact that their position in the sentence significantly influences the meaning. Compare examples (33) and (34) repeated here as (63a) and (63b):

(63)

- a. Petorica visokih plavih dečaka su igrala fudbal.  
five.COLL tall.M.PL.GEN blonde.M.PL.GEN boys.M.PL.GEN are played.N.PL football  
'Five of the tall blonde boys played football.'
- b. Visoka petorica plavih dečaka su igrala fudbal.  
tall.N.PL.NOM five.COLL blonde.M.PL.GEN boys.M.PL.GEN are played.N.PL football  
'The tall five of the blonde boys played football.'

In (63a), there is a number (greater than 5) of tall, blonde boys, and five of them played football. In (63b), there is a number (greater than 5) of blonde boys, and five of them, who are tall, played football. This difference in meaning implies two things: (i) the collective numeral does not quantify over the modified noun, but picks out a certain number of referents from the group denoted by the noun in question; and (ii) the scope of the adjective depends on its position with respect to the numeral. This also suggests that the position of the collective numeral in the nominal domain cannot be parallel to that of the cardinal number proposed in Figure (3). That is, the collective numeral is not merged on top of the noun when there are intervening adjectives. Rather, it is a head of the projection that is merged on top of the already built DP/NP. I call the projection headed by a collective numeral a Collective Phrase (CollP). The fact that we see accusative marking on the collective rather than the noun when it is in the object position supports this assumption.

- (64) Tamara je videla petoricu dečaka.  
Tamara is seen five.ACC boys.GEN  
'Tamara saw five of the boys.'



The question to ask next is what the features of masculine collectives are. Taking into account that the features of the adjective that modifies the collective are [gender: neuter] and [number: plural], it is reasonable to believe that those features come from the collective itself. Moreover, the marking on the verb is also neuter plural, suggesting again that those features are inherently specified on the collective. In other words, the features on the verb are not default (i.e. neuter singular), meaning that Agree was successful. The only two prospective goals for the verbal probe are the noun and the numeral. Between the two goals, the verb chooses the numeral for two reasons. First, by virtue of the fact that it has its case feature valued (i.e. genitive), the noun is inactive and as such is not suitable for agreement, whereas the numeral still has unvalued case features; thus it is active. And secondly, locality seems to be of importance here: even if the noun were suitable for Agree, the fact that the numeral is the highest head in the nominal domain makes it a more preferable goal.

One might wonder, however, why a masculine collective would have its gender feature valued as neuter, when it exclusively modifies masculine nouns. A reasonable explanation would be to postulate that SC numerals do not have masculine variants. Recall that in cases with cardinals 2, 3 and 4 – the gender distinction is between feminine and neuter; with neuter being employed with masculine nouns, too. Additionally, masculine collectives are declined like a collective noun *deca* ‘children’ which is inherently neuter plural (see Table 12 below).

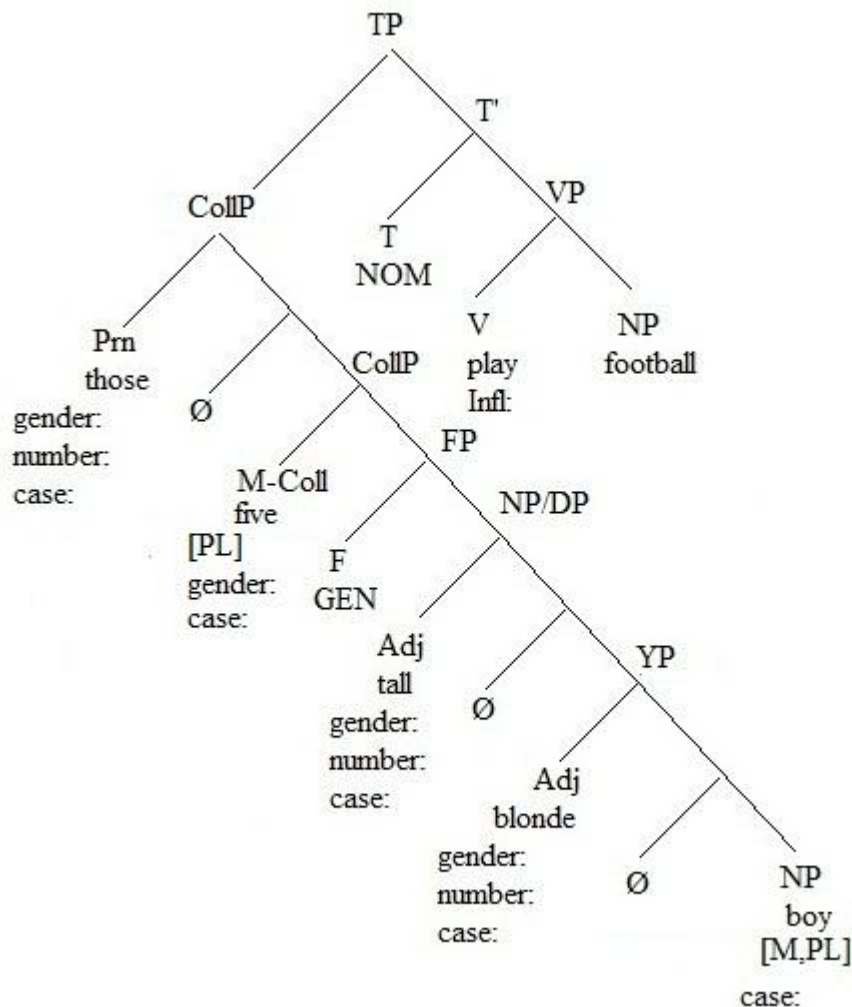
*Table 12: Declension of masculine collectives*

Case	Masculine collective	Collective noun (neuter plural)
<b>Nominative</b>	petorica	deca
<b>Genitive</b>	petorice	dece
<b>Dative</b>	petorici	deci
<b>Accusative</b>	petoricu	decu
<b>Instrumental</b>	petoricom	decom
<b>Locative</b>	petorici	deci

I thus assume masculine collectives to be inherently specified for the number feature as plural. Their gender feature is valued by the noun as neuter for the same reasons as in the

cases of 2, 3, 4 cardinals. A derivation of a sentence like that in (63a) would thus be the following (see Figure 4, below).

Figure 4: Derivation of masculine collectives<sup>32</sup>



The derivation starts with the noun, specified for a plural number feature and a masculine gender feature. All the modifying adjectives are merged on top of it and enter into Agree with the noun. The collective gets merged with the intervening FP, assigning genitive to the noun and the modifiers. The collective enters the derivation with inherent plural features and

<sup>32</sup> As pointed out by Marjo van Koppen (p.c.), the derivation of collectives as presented in Figure (4) predicts that it is possible to combine collective and cardinal numerals to get a meaning X number of Y number of referents. This is indeed possible, but only if the preposition *od* ‘from/ out of’ is inserted between the collective and the cardinal.

1. Dvojica od pet visokih plavih dečaka su igrala fudbal.  
 two.COLL from five.CARD tall blonde boys are played football  
 ‘Two out of five tall blonde boys played football.’

It seems that when a cardinal number is introduced, an overt preposition is required in order for the collective to be able to express partitive meaning.

unvalued gender features. It enters into Agree with the noun, and gets its gender feature valued as neuter, as it cannot read masculine from the noun. Next, the numeral values the features of all the modifiers (adjectives/ demonstratives) that dominate it. When T is merged, the collective is active due to its unvalued case feature and the operation Agree takes place: the verb receives neuter plural features, and the collective gets nominative case.

#### 4.2. Mixed collectives

Mixed collectives are used with nouns referring to groups of mixed gender, or groups whose referents' gender is unknown to the speaker. The nouns modified by mixed collectives fall into a specific category of nouns in SC – the so-called collective nouns. This is because they carry an inherent collective meaning (Stankiewicz, 1986). For example, a collective noun *deca* 'children' includes both female and male children regardless of the possible combinations of the group in question (boys only, girls only, or both boys and girls) (Kim, 2011). The noun *dete* 'child' does not have a regular plural form, only the collective plural *deca*. For this reason, it cannot be combined with cardinal numbers higher than 5. Instead, in order to express the proposition of there being five children, one must employ the mixed collective numeral – collective noun combination.

The observed agreement patterns with mixed collectives within the nominal domain are the same as those of masculine collectives: the noun is in the genitive plural, and the adjectives agree with the noun if they follow the numeral. If they precede the numeral, the adjectives are always neuter singular and marked for nominative case. The marking on the verb, however, is neuter singular. Unlike masculine collectives, mixed collectives do not show any distinctions for case, but they always appear in the same form. Compare the examples in (65).

(65)

- a. Petoro    nemirne            dece                            je    igralo fudbal.  
 five.COLL    unruly.N.PL.GEN    children.N.PL.GEN    is    played.N.SG    football  
 'Five unruly children played football.'

- b. Nemirno petoro dece je igralo fudbal.  
 unruly.N.SG.NOM five.COLL children.N.PL.GEN is played.N.SG football  
 ‘The unruly five of the children played football.’

In (65a), we have agreement between the adjective and the noun – they are both neuter plural, and they bear genitive case. In (65b), on the other hand, the adjective is neuter singular and bears nominative case, thus it does not show agreement with the noun. In both cases, the verbal agreement is neuter singular. When it comes to meaning, the position of the adjectives plays an important role, just like it does with masculine collectives. In other words, while in (65a) there are five children out of the group of unruly children that are playing football, in (65b), there are five unruly children out of the group of a number of children that are playing football. This parallel in meaning with masculine collectives suggests a parallel in structure with these numerals, too. I thus assume a unified structure for both sets of collective numerals (see Figure 4). Under the proposed structure, the adjective in (65b) is thus expected to agree with the collective numeral. Additionally, the numeral is also expected to dictate the marking on the verb. This scenario seems plausible, considering the fact that both the adjective and the verb appear in their neuter singular forms. Hence, it seems reasonable to conclude that the features of the mixed collective are [gender: neuter] and [number: singular].

Nevertheless, the neuter singular marking on the verb can also mean that agreement was unsuccessful, and default features were inserted on the verb (i.e. neuter singular). Consider the examples in (66) with coordinated mixed collectives that suggest that the mixed collective cannot be the source of the verbal agreement.

(66)

- a. Mače i pile su trčali po dvorištu.  
 kitten.N.SG.NOM and chicken.N.SG.NOM are run.M.PL at yard  
 ‘A kitten and a chicken ran around the yard.’
- b. Dvoje mačića i petoro pilića je trčalo po dvorištu.  
 two.COLL kittens.M.PL.GEN and five.COLL chickens.M.PL.GEN is run.N.SG around yard  
 ‘Two kittens and five chickens ran around the yard.’

If the mixed collectives in (66b) were indeed neuter singular, and the agreement happened between the numeral and the verb, the expected verbal form would thus be the same as that in (66a) – masculine plural. As shown in (66a), the coordination of two neuter singulars gives

masculine plural verbal marking. The observed agreement in (66b), however, is still neuter singular, suggesting that it cannot come from the numeral. Instead, it is very likely that it is the default agreement that comes in play.

In order to explore this option of default agreement, one could postulate that the reason agreement failed is the defectiveness of the mixed collective numeral, similar to that of 5+ cardinals. Recall from section 3.2. that I have proposed that 5+ cardinals are defective in that they do not have a full set of phi-features which prevents them from entering into agreement with the verb. I have argued that while these numerals have an unvalued number feature, they lack a gender feature. Similarly, I propose that mixed collectives enter the derivation with an unvalued number feature, and they lack a gender feature, making them unsuitable goals for verbal agreement. Of course, the question that requires addressing is why mixed collectives lack gender feature.

Considering the fact that mixed collectives quantify over groups of ultimately unknown gender, it is quite intuitive to think of them as “gender insensitive”. Moreover, the fact that semantic agreement is not an option with mixed collectives signals that gender indeed is not specified.

- (67) Dvoje crnih mačića je spavalo/ \*su spavali u korpi.  
 two.COLL black.M.PL.GEN kittens.M.PL.GEN is slept.N.SG are slept.M.PL in basket  
 ‘Two black kittens slept in a basket.’

However, one might argue that the reason why it is not possible to have semantic agreement with mixed collectives is due to the fact that the referents of the noun in question do not necessarily belong to one sex, and that the numeral has no effect on it. Consider the sentence in (68) marked as a borderline case by some native speakers.

- (68) ??Dvoje visokih dečaka je igralo/ \*su igrali fudbal.<sup>33</sup>  
 two.COLL tall.M.PL.GEN boys.M.PL.GEN is played.N.SG are played.M.PL football  
 ‘Two/ Five tall boys played football.’

In (68), the mixed collective modifies a masculine noun referring to a group of male referents exclusively. If semantic agreement relies solely on the noun, it would be expected for masculine plural to be an option in (68). This, however, is not the case, which suggests that

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<sup>33</sup> A sentence like (66) is very colloquial and can only be encountered in spoken language. Although the use of a masculine collective would be more appropriate in this case, the mixed collective is not entirely wrong.

the numeral, too, plays a role in semantic agreement. This leads me to conclude that mixed collectives lack a gender feature altogether and that the neuter singular marking on the verb is the result of default agreement.

A remaining question is still that of the neuter singular marking on the adjective in cases in which it precedes the numeral. If the numeral is indeed defective and cannot enter into agreement, where do the neuter singular features of the adjective come from? I suggest that, just like neuter singular is default form for the verbs in SC, it is the default for nominal and adjectival elements as well. For instance, in SC, the demonstrative pronoun ‘that’ makes gender and number differences: *taj*.<sub>M.SG</sub>, *ta*.<sub>F.SG</sub> and *to*.<sub>N.SG</sub>; and *ti*.<sub>M.PL</sub>, *te*.<sub>F.PL</sub> and *ta*.<sub>N.PL</sub>. An answer to a question like ‘What do you want?’ in SC is always ‘*To*’ ‘that.<sub>N.SG</sub>’ regardless of the gender or number of the referent. Similarly, in fragment answers to a question like ‘How are you?’ – the response is always in neuter singular form: ‘*Dorbro*’ ‘fine.<sub>N.SG</sub>’. Additionally, in SC, an exclamative like ‘good luck!’ is always expressed with the adjective ‘happy’ in the neuter form: *srećno!* ‘happy.<sub>N</sub>’.

Thus, the derivation of a sentence like that in (65b) proceeds in the following way. The derivation starts with the noun inherently specified with neuter plural features. The mixed collective is merged on top of it with an intermediate FP assigning genitive to the noun, making it inactive for further Agree. Before the features on the noun get deleted, it agrees with the collective, valuing its number feature as plural. Although it has its number feature valued, the numeral is still defective as it lacks gender features making it unsuitable for Agree with the verb. The adjective then gets merged on top of the CollP with unvalued number, gender and case features. The adjective cannot value its features against the noun because it is inactive, or against the numeral because it is defective. Thus, the default neuter singular features get inserted. Similarly, the attempted agreement fails between T and the two prospective goals in the nominal domain (i.e. noun because it has all its features valued, and the numeral because it is feature defective) hence we observe default agreement on the verb. Finally, the case features of the numeral and the collective get a default nominative value.

## 5. Agreement mismatches with conjoined nouns

In the previous chapters I have offered a new, unified analysis for both cardinals and collectives in SC. I have shown that numerals are triggers for the apparent agreement mismatches, and that in certain cases verbal markings mirror the features of the numerals (i.e. 2,3,4 numerals and masculine collectives), while in other cases the default, neuter singular,

agreement has to be employed (i.e. 5+ numerals and mixed collectives). In this chapter, I take a brief look into conjoined quantified nouns, and the agreement patterns they evoke.

When plural nouns bearing different gender features are conjoined in SC, there are two options for verbal agreement: (i) with the nearest conjunct; or (ii) masculine plural (Corbett, 1979). However, this is not entirely correct as coordination of masculine plural and feminine plural nouns in which the feminine noun is the second conjunct does not allow for feminine plural marking on the verb.

(69)

- a. Dečaci i devojčice su igrali/ \*igrale karte.  
 boys.M.PL and girls.F.PL are played.M.PL/ \*played.F.PL cards  
 ‘Boys and girls played cards.’

Similarly, the coordination of a masculine plural noun with a neuter plural noun as a second conjunct does not give neuter plural agreement on the verb.

- b. Očevi i deca su trčali/ \*trčala maraton  
 fathers.M.PL and children.N.PL are run.M.PL/ \*run.N.PL marathon  
 ‘Fathers and children ran the marathon.’

The agreement patterns change when the conjoined NPs are modified by numerals. When two masculine nouns are conjoined, both modified by a numeral, the verb agrees either with the second conjunct, or it has masculine plural marking. This holds for both cardinal numbers (70a-b) and masculine collectives (70c). That is, when the second conjunct is a masculine noun modified by the numeral 2 (70a), the observed verbal agreement can be neuter plural (i.e. second conjunct agreement). Likewise, in (70b) we see the default - neuter singular agreement, which is the agreement induced by numerals 5+. In the case of masculine collectives (70c), the agreement is, as expected, neuter plural.

(70)

- a. Pet dečaka i dva pilota su igrali/ igrala tenis.  
 five.CARD boys.M.PL and two.CARD.N.PL pilot.M.SG are played.M.PL / played.N.PL tennis  
 ‘Five boys and two pilots played tennis.’
- b. Dva dečaka i pet pilota su igrali/ je igralo tenis.  
 two.CARD.N.PL boy.M.SG and five.CARD pilots.M.PL are played.M.PL/ is played.N.SG tennis  
 ‘Two boys and five pilots played tennis.’

- c. Dva dečaka i petorica pilota su igrali/ igrala tenis.  
 two.CARD.N.PL boy.M.SG and five.COLL.N.PL pilots.M.PL are played.M.PL/ played.N.PL tennis  
 ‘Two boys and five pilots played tennis.’

When two quantified feminine nouns are conjoined, the verbal agreement is feminine plural. Optionally, when the second conjunct is a noun modified by a 5+ numeral, verbal agreement can, expectedly, be neuter singular (i.e. second conjunct agreement).

- (71) Dve devojčice i pet učiteljica su igrale/ je igralo tenis.  
 two.F.PL girl.F.SG and five teachers.F.PL are played.F.PL/ is played.N.SG tennis  
 ‘Two girls and five teachers played tennis.’

The coordination of two quantified neuter nouns also gives neuter plural agreement on the verb. In (72a), neuter singular agreement is optional, as the second conjunct on its own triggers default agreement on the verb. In (72b), only neuter plural is possible, because the second conjunct – a 2, 3, 4 phrase induces neuter plural, too.

- (72)
- a. Dva jezera i pet mora su presušila/ je presušilo.  
 two.N.PL lake.N.SG and five seas.N.PL are dried.N.PL/ is dried.N.SG  
 ‘Two lakes and five seas dried out.’
- b. Pet mora i dva jezera su presušila.  
 five seas.N.PL and two.N.PL lakes.N.SG are dried.N.PL  
 ‘Five seas and two lakes dried out.’

Quantifying two animate neuter nouns proves to be quite tricky. This is because most of the animate neuter nouns (e.g. *mače* ‘kitten.N’ or *pile* ‘chicken.N’) become masculine once in their plural forms (*mačići* ‘kittens.M’, *pilići* ‘chickens.M’) so the parallelism with singulars is lost. Additionally, neuter animate nouns cannot be quantified by cardinal numbers 5 and above. This is because they do not have simple plurals, but only collective ones. Therefore, a mixed collective has to be employed to modify a collective noun. The possibilities for verbal agreement, however, change considerably. Following the pattern of inanimate neuter nouns, it is expected for animate nouns to produce neuter singular (second conjunct) agreement, or neuter plural (semantic agreement). Consider the sentence in (73). The observed verbal marking is either the expected neuter singular, or masculine plural.



- (73) Petoro dece i petoro piladi su trčali/ je trčalo po dvorištu.  
 five.COLL children.N.PL and five.COLL chickens.N.PL are run.M.PL/ is run.N.SG in yard  
 ‘Five children and five chickens ran around the yard.’

Thus, with conjoined quantified NPs of the same grammatical gender, the observed agreement is either (i) that of the second conjunct, dictated by the numeral; or (ii) plural (corresponding to the gender of the nouns in question), except in cases of two animate neuter nouns when the verbal agreement is masculine plural (and not the expected neuter plural). However, when the conjoined NPs are of different gender, verbal agreement is not as predictable. Namely, while in all cases agreement with the second conjunct is an option, the semantic agreement is quite unexpected. In all combinations (masculine + neuter, masculine + feminine and feminine + neuter), irrespective of the ordering of conjuncts, the only other possible agreement, apart from that of the second conjunct, is masculine plural. This is quite surprising, as one would expect semantic agreement in these cases to be either neuter plural (as the gender of the referents is mixed), or possibly neuter singular (as default agreement). This behavior is especially peculiar for neuter – feminine (74c), and neuter animate – neuter animate combinations (73) as, at least grammatically, there is no sign of masculine gender.

(74)

- a. Dva dečaka i dva deteta su igrala/ igrali tenis.  
 two.N.PL boy and two.N.PL child are played.N.PL/ played.M.PL tennis  
 ‘Two boys and two children played tennis.’
- b. Dva dečaka i dve devojčice su igrale/ igrali tenis.  
 two.N.PL boy and two.F.PL girl are played.F.PL/ played.M.PL tennis  
 ‘Two boys and two girls played tennis.’
- c. Dva deteta i dve devojčice su igrale/ igrali tenis.  
 two.N.PL child and two.F.PL girl are played.F.PL/played.M.PL tennis  
 ‘Two children and two girls played tennis.’

A possible reason for masculine plural marking on the verb may have its roots in the use of personal pronouns when referring to a group of people of different genders. While in English, for instance, one would always use *they* when referring to a group of people, irrespective of the genders of its referents, SC makes use of three different forms, each corresponding to one grammatical gender: *oni* ‘they.M’, *one* ‘they.F’ and *ona* ‘they.N’. Hence, for referring to a

group of males only, one would use *oni*, and when referring to an exclusively female group, one would use *one*. When referring to a group of children (which bear neuter grammatical gender in SC), native speakers use the masculine form *oni*, rather than the neuter one *ona*. For example, an answer to a question like ‘*Who broke the window?*’ (and a group of children did it) would be ‘*Oni*’ – ‘they.M’, and never ‘*Ona*’ – ‘they.N’. Similarly, the masculine form *oni* is used when referring to a masculine – feminine group, say five actors and five actresses, as well as feminine – neuter groups (e.g. five actresses and five children).<sup>34</sup>

In the cases where there is only one numeral and a conjoined NP, the scope that the numeral takes is not clear. In other words, it is not clear whether the numeral takes scope over the whole coordinated structure, or just over the first (i.e. closer) noun, or over each noun individually. That is, what is the meaning of the SC equivalent of a sentence like (75)?

(75) Five actors and actresses appeared on the stage.

There are three possible readings of this sentence, depending on the scope of the numeral. (i) five actors and an unknown number of actresses appeared on the stage; (ii) five actors and five actresses appeared on the stage; or (iii) a total of five people appeared on the stage (people being both actors and actresses). In (i) the numeral takes scope over the first conjunct, in (ii) it takes scope over both nouns individually, and in (iii) it takes scope over the whole conjunct as a unit. What seems to be the case in SC, according to native speakers’ judgments, is that cardinal numbers tend to produce the readings in (ii) and possibly (i), while mixed collectives tend to have those in (iii). Compare the sentences in (76).

(76)

- a. Pet glumaca i glumica je izašlo/ su izašli na scenu.  
 five.CARD actors.M and actresses.F is appeared.N.SG/are appeared.M.PL on stage  
 ‘Five actors and actresses appeared on the stage.’
- b. Petoro glumaca i glumica je izašlo/ su izašli na scenu.  
 five.COLL actors.M and actresses.F is appeared.N.SG/ are appeared.M.PL on stage  
 ‘Five actors and actresses appeared on the stage.’

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<sup>34</sup> After filling out the questionnaire and giving their judgments on the acceptability of conjoined NPs with various verbal agreements, the informants were asked to justify their answers. Specifically, they were asked why is it that they used masculine plural in examples like those in (74). 10 out of 11 people said that it is because they would refer to any group of human referents as *oni* ‘they.M’ (except for female only groups, in which case they always use *one* ‘they.F’). As pointed out by Heidi Klockmann, this preference for masculine gender could be due to the fact that masculine gender is the less specified human gender.

For (76a), native speakers can obtain two readings, namely that in (iii) and (ii), with a slight preference for (iii)<sup>35</sup>. That is, (ii) there are ten people on the stage, namely, five actors and five actresses, or (iii) there are five people in total on the stage. For (76b), on the other hand, only the reading in (iii) is possible: there are five people on the stage (the male/female ratio is unknown). Considering the fact that in (76b), the numeral actually quantifies a group of referents of different genders, the use of mixed collective is quite expected and justified. Moreover, the fact that the numeral in (76b) cannot modify each noun individually supports the idea that mixed numerals indeed cannot modify groups of referents belonging to the same gender. Additionally, in both sentences, the agreement on the verb is either neuter singular, which is the agreement of both 5+ cardinals and mixed collectives, or masculine plural. Similarly, masculine collectives also produce the reading in (iii). Expectedly, both nouns have to be masculine. The marking on the verb is that of the collective, i.e. neuter plural.

(77)

- a. Petorica pilota i kuvara su učestvovala u kvizu.  
 five.COLL pilots.M and cooks.M are took.part.N.PL in quiz  
 ‘Five of the pilots and cooks took part in the quiz.’
- b. \*Petorica pilota i glumica  
 five.COLL pilots and actresses

Numerals 2, 3 and 4, make a gender distinction when it comes to verbal agreement (feminine plural for feminine nouns, and neuter plural for neuter and masculine nouns). The most frequently observed marking on the verb is masculine plural.<sup>36</sup>

- (78) Tri glumca i glumice su izašli/ izašle na scenu.  
 three actors.M and actresses.F are appeared.M.PL/ appeared.F.PL on stage  
 ‘Three actors and actresses appeared on the stage.’

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<sup>35</sup> A majority of native speakers said that although they can get the reading in which the numeral takes scope over each noun individually (i.e. five actors and five actresses), in order to express that proposition they would overtly quantify each of the nouns:

1. Pet gulmaca i pet glumica je izašlo na scenu.  
 five actors and five actresses is appeared on stage  
 ‘Five actors and five actresses appeared on the stage.’

<sup>36</sup> Eight out of eleven informants said that masculine plural agreement on the verb is their first choice. For the remaining two, it is second conjunct agreement (i.e. F.PL for (78)).

Once again the appearance of masculine plural on the verb seems to suggest some sort of semantic agreement related to the use of personal pronouns (i.e. *oni* ‘they<sub>M</sub>’) when referring to groups of mixed genders such as that of three actors and three actresses.

## **6. Numerals in other Slavic languages**

Having discussed the behavior of SC numerals extensively, in this chapter, I very briefly touch upon cardinal numbers and collective numerals in other Slavic languages. More specifically, I address Polish, Russian, Czech and Bulgarian numerals and I point out where they meet the SC patterns. Cardinal numbers and collective numerals in these languages are discussed in separate sections.

### **6.1. Cardinal numbers**

The agreement patterns involving cardinal numbers in Polish are to some extent similar to the patterns observed in SC. Namely, numeral 1 behaves like any lexical adjective in that it agrees in phi-features and case features with the noun that it modifies. Additionally, numeral 1 never triggers agreement mismatches, similarly to SC. When it comes to agreement mismatches with cardinal numbers, Polish exhibits two different types: 5+ agreement mismatches and gender induced agreement mismatches (Klockmann, 2012). With 5+ numerals, the modified noun is always genitive and the verbal agreement is default- neuter singular. Additionally, the motivation for the default agreement on the verb, as argued for SC in this thesis, is the same as that which Klockmann enlists for Polish: Polish 5+ numerals, as well as SC ones are feature defective: they are only specified with a number feature, and lack a gender feature.

The gender induced agreement mismatches occur with numerals 2, 3 and 4 on the one hand and 5+ numerals on the other but only with two specific masculine subgenerals – masculine personal and masculine devirilized. These two subgenerals appear on nouns of masculine gender that denote human-like referents (e.g. dwarves or elves). In those cases the numerals optionally assign genitive to the noun which in turn triggers a so called case leaking producing genitive on the numeral, too, and default agreement on the verb. With 2, 3, 4 numerals, in other genders, the numeral agrees in features with the noun that it modifies and triggers true agreement on the verb.

Numeral phrases in Russian exhibit a quite puzzling behavior. The numeral phrase behaves differently with respect to different positions in a sentence. Namely, when the phrase is in a position in which it can get structural case, the numeral acts as a head assigning genitive to the noun. On the other hand, when the same phrase is in an oblique case position, the quantified noun, and not the numeral acts as phrase head and the numeral exhibits an adjective-like behavior and agrees with the quantified noun (e.g. Babby, 1987; Corbett, 1993; Rappaport, 2002), which is also the behavior observed in Polish. This distinction, according to Rappaport (2002) is related to the numeral's case feature being valued or not. The numerals in Russian can, but need not be merged into the structure with the case feature already valued. The gender and animacy features, on the other hand, are necessarily unvalued and agree with the quantified noun in the course of the derivation. Numerals with a valued case feature can only be found in structural case positions, but not in inherent ones. In these cases, the case feature of the numeral is copied onto the noun. The inherent case position in these instances is not an option because that would entail that the noun, which is already inherently case valued, receives case again via agreement with the numeral. On the other hand, numerals with unvalued case features can be found in both structural and inherent case

Considering only numeral phrases in structural case positions in Russian; more specifically, subject numeral phrases, the agreement patterns are the following.<sup>37</sup> For 2, 3, 4 numerals, the quantified noun is generally in the genitive singular, which is arguably a paucal case which surfaces as genitive singular. However, the verbal morphology is plural, suggesting either a mismatch in the number feature between the noun and the verb, or more likely a form of semantic agreement. This is what occurs in SC, where 2, 3, 4 numerals take singular nouns and optionally trigger semantic (plural) agreement. According to the native speakers questioned, with numerals 2, 3 and 4 in Russian, only plural agreement is possible, unlike in SC where true syntactic agreement with the numeral head is an option, and actually preferable. With Russian neuter inanimate nouns, however, only neuter singular agreement is observed on the verb, suggesting either syntactic agreement with the noun, or possibly default agreement (e.g. Corbett & Fraser, 2000; Marušič & Nevins, 2009).

Russian 5+ numerals modify plural nouns, just like SC ones. The agreement that occurs with these numerals is either plural or neuter singular. The plural agreement can be

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<sup>37</sup> The generalizations presented here for Russian, Czech and Bulgarian are derived from the data collected by Anton Nguyen and myself as part of the project "The Uniformity of Linguistic Variation". (available at <http://www.linguisticvariation.com>)

stipulated to be syntactic agreement with the noun, or possibly semantic agreement. Neuter singular on the other hand is most likely a form of default agreement. This behavior is typical of feminine nouns and masculine animate nouns. Masculine inanimate nouns can only appear with verbs in the plural. Neuter nouns, nevertheless, obligatorily trigger neuter singular morphology on the verb, suggesting again default agreement. The fact that no plural agreement can occur with neuter nouns seems to suggest that it is indeed semantic agreement rather than syntactic. If it were semantic agreement, the non-optionality of plural verbal marking with neuter nouns could not be accounted for. Thus, Russian 5+ numeral phrases pattern to a great extent to those of SC: the verbal agreement is either plural (i.e. semantic agreement) or default (i.e. neuter singular). Finally, numeral 1 in Russian, just like in Polish and SC, does not affect verbal agreement.

The agreement mismatches in Czech occur only with 5+ numerals where the verb is in the neuter singular form suggesting the application of default agreement<sup>38</sup>. This behavior is again expected based on the data from the other Slavic languages. Numeral 1 induces singular; and 2, 3 and 4 induce plural agreement on the verb.

Bulgarian numerals induce no agreement mismatches in terms of verbal behavior, and they agree solely with the noun they quantify over, exhibiting thus an adjectival behavior. However, Bulgarian has a special set of numerals that occur only with masculine human nouns and which cannot co-occur with the count forms. These numerals closely resemble masculine collective numerals in SC. Nevertheless, to go into detail and elaborate on this set of Bulgarian numerals is beyond the scope of this thesis.

## 6.2. Collective numerals

Apart from SC collectives, Kim (2011) also investigates collective numerals in Polish and Russian. In this section, I briefly report on Russian and Polish collectives (see Kim, 2011 for more elaborated accounts).

In Russian, collective numerals are generally used with masculine animate nouns, in which they are similar to SC masculine collectives. They are employed to denote totality or collectivity, to indicate gender specification (i.e. masculine), to express definiteness and to quantify over *pluralia tantum* nouns and nouns of paired objects (e.g. Timberlake, 2004;

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<sup>38</sup> Masculine inanimate nouns quantified by 5+ numerals apparently trigger masculine plural on the verb. This, however, could be biased by the type of the verb we used in the questionnaire (i.e. the verb was unaccusative).

Kim, 2011). The agreement observed on the verb is either plural (i.e. semantic agreement) or neuter singular (i.e. default agreement). Default agreement with collectives in Russian actually patterns with mixed collectives in SC, as masculine collectives show true syntactic agreement. This pattern with mixed collectives is actually not very surprising as Russian collectives do not exclusively quantify masculine nouns. Contrarily, they can modify nouns such as ‘children’, ‘people’ or ‘kittens’, which in SC appear solely with mixed collectives.

Polish collective numerals are used in a similar manner as SC mixed collectives: they denote groups of mixed gender, young animals, nouns of paired objects etc. The contrast between individuated and collective meaning, however, cannot be expressed by cardinal/collective numeral choice. Unlike collectives in SC and Russian which in contrast to their cardinals highlight the partitive reading and signify the totality of a unit, Polish collectives emphasize the mixture of genders of the group in question (Kim, 2011). The verbal agreement with Polish collectives is the default – neuter singular (Sussex & Cubberley, 2006). This verbal agreement is also the only possible agreement observed with SC mixed collectives.

## 7. Conclusion

Certain SC numeral phrases in the subject position trigger apparent mismatches in terms of features between the verb and the quantified noun. Apart from numeral 1, which behaves like a true adjective and has no effect on the verbal morphology, cardinal numerals 2, 3 and 4 on the one hand, and 5 and above on the other, give rise to seemingly unexpected verbal forms. Similarly, the two sets of collective numerals – masculine collectives and mixed collectives, also exhibit agreement mismatches.

With 2, 3 and 4, the observed verbal agreement is feminine plural for feminine nouns, and neuter plural for neuter and masculine nouns. At first glance, the agreement with the masculine noun seems to be the odd one out, while the neuter and feminine ones appear to be instances of true syntactic agreement between the noun and the verb. Upon closer inspection, however, this seems not to be the case. Namely, as I have shown in the section 3.1., numerals 2, 3 and 4 exclusively quantify nouns in their singular forms. The inability of these numerals to modify *pluralia tantum* nouns supports this claim. Therefore, what looked like true agreement with neuter and feminine nouns, in fact turned out to be a mismatch. Moreover, the modifying adjectives within the numeral phrase also exhibit feature mismatches with the

modified noun. The features of the adjectives are feminine plural for the feminine nouns, and neuter plural for both neuter and masculine nouns. Thus, the features observed on the adjectives match those of the verbs.

To account for this curious adjectival behavior, I have suggested that they in fact modify the already quantified nouns. This claim is supported by the native speakers' judgments in terms of the scope of the numeral. I have also suggested that SC numerals are heads of numeral phrases which take nouns as their complements, assigning them genitive case via an intervening head. The different word order in terms of numeral – adjective ordering is achieved via head movement of the numeral (I treat adjectives as specifiers of their own projections). Serving as heads of their own projection, and being very noun-like (these numerals used to decline like nouns, but have lost this ability in the present-day SC), I consider numerals 2, 3 and 4 to be inherently specified with number features. They enter the derivation with their number feature valued as plural, and their gender features unvalued. There are at least two reasons why agreement happens between the adjective and the numeral, and not the adjective and the noun. First, by the time the adjectives are merged into the structure, the noun is inactive, and therefore unsuitable for agreement. By virtue of the fact that SC numerals are inherent case assigners (Franks, 1995), as soon as the numeral is merged on top of the noun, the noun gets its case feature valued and becomes inactive for further agreement. Secondly, even if the noun was still active, it would be highly unlikely for it to be a suitable goal for adjectival agreement, since there is an active head intervening between the two, namely, the numeral. Hence, the agreement happens between the numeral and the adjective, leaving the numeral caseless and thus active for further agreement. Once finite T gets merged, Agree applies between the two, valuing the features of the verb in the process and consequently assigning nominative case to the numeral and the adjectives.

The remaining question, naturally, was regarding the feminine versus neuter numeral forms, with, as I suggested, a gap for the masculine form. I speculated that the pattern of the numeral *dve*.<sub>F</sub>/*dva*.<sub>N/M</sub> which captures the distinction between feminine and masculine/neuter is extended to numerals three and four which, however, only have one form for all three genders. The reasons why I assume this extension are: (i) the verbal agreement observed with 3 and 4 mirrors that of 2 (i.e. feminine for feminine nouns, and neuter for masculine and neuter nouns); (ii) the ability to express dative with the feminine form of the numeral 2 is extended to 3 and 4 – masculine and neuter nouns modified by these numerals cannot express dative case; and (iii) masculine gender is the only gender that has a special set of collective



numerals at its disposal, suggesting that these numerals are already represented in the SC number system. Ultimately, I proposed that the numeral cannot “read” the masculine gender from the noun, but that instead it takes neuter.

Numerals 5 and above trigger different agreement patterns than 2, 3 and 4. For one, they do not make gender distinctions in either the form of the numeral or the verbal morphology. The observed agreement on the verb is neuter singular, which is a default agreement in SC. I have proposed that the reason why default features appear on the verb is the failure of syntactic agreement with both the numeral and the noun. The agreement with the noun is blocked because the noun has all its features valued, just like with numerals 2, 3 and 4, and is thus inactive. The numeral, on the other hand, I suggest is defective and therefore unsuitable for agreement. This idea of the defectiveness of the numeral is adopted from Klockmann’s (2012) work on Polish numerals. Specifically, I claim that 5+ numerals enter the derivation with only their number feature unvalued, and are missing the gender feature. The reason why I assume the numeral to be lacking the gender feature and not the number feature is because, unlike 2, 3 and 4, numerals 5 and above seem to be rather gender insensitive. Additionally, it is quite intuitive to assume the numerals to be endowed with a number feature, since they, after all, signify plurality of some sort. The number feature is valued against the noun. Even though defective, the numeral has its number feature unvalued, and can therefore enter into agreement with the noun. Once its number feature is valued, the defectiveness of the numeral comes into play and prohibits it from entering into agreement with either the verb, or the adjective. Thus, the marking on the verb is default – neuter singular. The adjectives, on the other hand, unable to agree with the closest head, i.e. the numeral, manage to agree with the noun and save the derivation. Adopting the view that the features do not get deleted until the whole phase is built up (Chomsky, 2000, 2001), it is not unnatural to assume that agreement between the adjectives and the noun indeed occurs. Furthermore, since the numeral itself is defective, it no longer represents the obstacle or a suitable intervening goal for the adjectival agreement as it does with numerals 2, 3 and 4. However, the adjectives and the numeral still have their features unvalued, since they cannot get nominative from T, as the agreement with T never happens. Instead, I suggest that in the process of assigning default agreement to the verb, the caseless nominal elements get default case, which, as I have shown, is nominative in SC.

The agreement patterns with collective numerals depend on the numeral – adjective ordering. Namely, when the adjectives precede the numeral, they also agree with it in terms

of features. On the other hand, when the adjectives follow the numeral (they are between the numeral and the noun), they agree with the noun. This behavior is not surprising considering the differences in meaning between the two configurations confirmed by the native speakers of SC. Namely, when the adjective precedes the numeral, it acts as a modifier of the numeral, while when it follows the numeral, it serves as the modifier of the noun. This distinction suggests that the collective numeral as a head of what I termed the Collective Phrase, serves as the head of the whole nominal domain, and therefore projects. As the highest head, it is also the only possible source for the verbal agreement.

The verb form observed with masculine collectives is neuter plural, which is also the morphology that the adjectives take when they precede the numeral. I have thus suggested that masculine collectives are inherently plural, and get their gender features valued as neuter via agreement with the noun. Although it might seem odd for numerals which exclusively modify masculine nouns to be neuter, there are, nevertheless, a number of hints that seem to suggest that this is indeed so. Apart from the numeral being the only possible source for verbal agreement which is always neuter plural, masculine cardinals decline like a collective noun *deca* ‘children’ which is neuter plural. In addition, the lack of a masculine variant of 2, 3, 4 cardinals seems to suggest that masculine gender is simply not present in the number system of SC.

Mixed collectives, on the other hand, trigger neuter singular agreement on the verb, as well as on any of the adjectives preceding them. There are two options regarding the source of agreement. First, it could be that mixed collectives are inherently neuter singular, and that they trigger true syntactic agreement; or, secondly, it could be the case that the agreement fails for some reason, hence the default features in the form of neuter singular are applied. I have shown that the latter option is more likely to be the right one. For one, if the mixed collectives were indeed neuter singular, the coordination of two collectives would give masculine plural marking on the verb, which is what is found with the coordination of two neuter singular nouns. This, however, is not the case, as the coordination of two mixed collectives still produces neuter singular. Hence I conclude that the numeral cannot be the source of the verbal agreement, and that the neuter singular on the verb is actually default agreement at play.

Just like with 5+ cardinals, I have proposed that mixed collectives are defective in that they lack a gender feature. Considering the fact that this set of numerals is used with groups of ultimately unknown gender, it is quite intuitive to think of them as “gender insensitive”.

Moreover, the fact that semantic agreement is not possible with mixed collectives also hints at their general gender insensitivity. Finally, the neuter singular features on the adjective, I have suggested, are also default features. Namely, as I have shown, neuter singular features are found on nominal elements in cases like fragment answers or interjections.

In conclusion, by assigning the proposed feature specification to different groups of SC numerals, I implicitly suggested that they indeed are in-between categories, as previously suggested by Klockmann (2012) for Polish. If the categories of nouns and adjectives are defined by their feature specification (Baker, 2003), numerals seem to fall somewhere in between. Namely, if adjectives carry all unvalued features, and nouns have all their features inherently valued, the numerals in SC fall either in the adjective category, or in some in-between category. More specifically, numeral 1, as I have proposed, enters the derivation with all its features unvalued, thus falling into the adjective category. Cardinals 2, 3 and 4, and masculine collectives, which have inherently valued number features and unvalued gender features, therefore fall into some in-between category. 5+ cardinals and mixed collectives, on the other hand belong to some intermediate category, as they only have their number feature unvalued, while they lack the gender feature. This category assignment, however, is not completely in line with Corbett's (1978) generalization that the higher the numeral is, the more noun-like properties it possesses. The feature specification for SC numerals that I have proposed here, suggests that numerals 2, 3 and 4 are actually more noun-like than numerals 5 and higher. Considering the diachronic development of numerals 2, 3 and 4, and the fact that they used to decline like nouns, it is not unnatural to assume that even though they do not display this behavior any longer, they still kept some of their original feature specification. Similarly, masculine collectives, which are inherently valued for number features and have unvalued gender features, and are essentially very similar to nouns, as they also decline. Conversely, the set of mixed collectives, as well as 5+ numerals, which are considered as lacking gender features, do not decline at all.

This survey of SC numeral phrases brings about interesting questions for further research. First, the idea that there is a gap for masculine gender in the numeral system is something that, according to my knowledge, has not been proposed before. It would be interesting to investigate if any of the other Slavic languages, or any other language belonging to a different family for that matter, exhibits similar gender constraints. Additionally, it would be useful to look further into the motivation for the exclusion of the

masculine gender in the SC number system, and not any other of the two remaining genders, and what resources the language has to exploit in order to compensate for that.

Secondly, why is it that only feminine 2, 3 and 4 numeral phrases have the ability to express dative? Historically, all genders were able to express any of the seven cases, but have lost this ability during the course of time. What is so special about dative case, and feminine gender, that only this combination still surfaces in the present day SC?

Finally, in order to get a better general picture regarding the underlying structure of SC numeral phrases, as well as their behavior outside the nominal domain, a closer look should be taken at numeral phrases in other sentential positions beside subject ones.

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