How to agree with a QNP

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Abstract

This paper focuses on the great variety of ϕ-agreement patterns and case alternations quantified noun phrases trigger in Serbo-Croatian. Novel data from Serbo-Croatian are contributed, showing more agreement patterns than so far attested. Crucial for the analysis is an observation that draws a parallel between the agreement patterns of quantified noun phrases and conjoined noun phrases. We will show that the data can best be described by a strictly derivational agreement system based on rule ordering (Müller 2009; Murphy and Puškar 2018) and operating in narrow syntax. Existing case-based approaches (Bošković 2003, 2006; Franks 1994; Pesetsky 1982) and INDEX-CONCORD based features system (Danon 2013; Wechsler and Zlatić 2000, 2003) fail to account for agreement alternations in pre- and post-verbal position as well as in NP-topicalisation configurations.

Keywords: agreement; genitive of quantification; topicalisation; Serbo-Croatian

1   Introduction

Different types of quantified noun phrases cross-linguistically trigger different types of subject-verb agreement – a phenomenon that has received much attention in previous work. The quantifier's morpho-syntactic category is argued to determine the agreement pattern. Consider the following examples: 'one' vs. 'five' in Russian and Serbo-Croatian. The quantifier 'one' acts as an adjective, the noun bears nominative case, and singular appears on the verb (1a). However, with an uninflecting numeral, such as 'five', in (1b), the agreement can alternate.

(1)   *Russian* (Franks 1994: 613)

    a.   Odn-a   devušk-a   rabotal-a   tam.
          one-F.SG.NOM girl-F.SG.NOM worked-**F.SG** there
          'One girl worked there'   (N-Agree)

    b.   Pjat' devušek-∅   rabotal-i / rabotal-o   tam
          five   girl-F.PL.GEN worked-**PL** / worked-**N.SG** there
          'Five girls worked there'   (N-Agree/default)

(2)   *Serbo-Croatian*

    a.   Jedn-a   devojk-a   je   došl-a.
          one-F.SG girl-F.SG.NOM AUX.3SG came-**F.SG**
          'One girl came'   (N-Agree)

    b.   Pet devojak-a: je došl-o / su došl-e.
          five girl-F.PL-GEN AUX.3SG came-**N.SG** / AUX.3PL came-**F.PL**

          'Five girls came'   (default/N-Agree)

For Slavic languages this phenomenon has also become known as *Genitive of Quantification*. Furthermore, subject-verb agreement in Hebrew (Danon 2013) can alternate between agreement with the quantifier and agreement with the noun, see (3a). However, both options are not always possible, as illustrated in (3b).

(3)   *Hebrew* (Danon 2013: 2)

    a.   30 axuz-im me-ha-maskoret holx-im / ?holex-et le-sxar
          30 percent-M.PL of-DEF-salary-F.SG goes-**M.PL** / goes-**F.SG** to-rent

          '30 % of the salary goes to (paying the) rent.'   (Q-Agree / ?N-Agree)

    b.   maxacit me-ha-tošav-im ovd-im / *oved-et be-xakla'ut
          half-F.SG of-DEF-residents-M.PL work-**M.PL** / work-**F.SG** in-agriculture

          'Half of the residents work in agriculture.'   (N-Agree / *Q-Agree)

Different proposals have been made for analysing the optionality of agreement (Bošković 2003, 2006; Danon 2013; Despić 2013; Franks 1994; Wechsler and Zlatić 2000, 2003), most of which restrict the empirical coverage to only certain types of quantifiers. The attention is often directed at the question of case assignment and the difference between agreeing and non-agreeing subjects, analysing neuter singular as a repair strategy for the latter. Additionally, for Bošković (2003) the option of plural agreement is triggered by the semantics in special cases. Danon (2013) on the other hand proposes a maximally permissive system of agreement in which the features appearing on the verb depend on whether ϕ-features of the quantifier are intrinsically valued or receive the value from the noun. In this system, optionality is always available, but there is no default option.

    We contribute novel data from Serbo-Croatian, which show that in this South Slavic language agreement can alternate between agreement with the quantifier (henceforth: Q-Agree), agreement with the noun (henceforth: N-Agree), and default neuter singular agreement, across different types of quantifiers that assign genitive case to the embedded noun. Crucially, this optionality arises when the quantified noun phrase (henceforth: QNP) is in the pre-verbal position, but post-verbally, only Q-Agree and default agreement are available. In this sense, agreement with QNPs resembles closest vs. highest conjunct agreement patterns, described for South Slavic languages (Bošković 2009; Corbett 1991; Willer-Gold et al. 2016). Since case-based systems arguing for semantic agreement and Danon's system cannot account for these restrictions on agreement in Serbo-Croatian, we turn to the solutions proposed for conjunct agreement, more specifically to the derivational system based on rule ordering, proposed by Murphy and Puškar (2018).

    Section 2 introduces the different types of QNPs available for Serbo-Croatian. In section 3 we point out several problems previous approaches to agreement with QNPs face, based on the data presented in section 2. The key observation regarding the parallelism between QNP agreement and conjunct agreement is presented in section 4. Section 5 compares two recent proposals made for conjunct agreement patterns in South Slavic and discusses their potential to be extended to QNP agreement patterns. We show that the rule-ordering system, developed for conjunct agreement by Murphy and Puškar (2018), can be faithfully extended to QNP agreement patterns, while also being able to account for additional NP-topicalisation. We address differences between QNPs and other genitive constructions in Serbo-Croatian in section 6. Section 7 summarises and concludes.

2   Agreement can alternate

According to the generalisations made by previous reports on the agreement patterns with QNPs in Serbo-Croatian (Bošković 2003; Franks 1994; Wechsler and Zlatić 2000, 2003), it is the quantifier's morpho-syntactic category that determines the agreement pattern. Quantifiers are divided by Wechsler and Zlatić (2003) into the following groups:

1. *Adjectival quantifiers*

   This group consists of quantifiers like *neki* 'some', *brojni* 'numerous', *svi* 'all', *svaki* 'every' etc. They agree with the noun they modify. The features on the verb always match the features of the noun, so previous reports have interpreted this as "N-Agree only".

2. *Nominal quantifiers*

   Quantifiers such as *većina* 'majority', *nekolicina* 'few', *niz* 'sequence', *deo/dio* 'part', *par* 'pair, couple' etc. fall into this group. They are full-fledged nouns, with their own set of ϕ-features, therefore there is no concord with the noun they modify. Only Q-Agree was reported available with these quantifiers and the noun bears genitive case.

   A subgroup of nominal quantifiers consists of quantifiers such as *dva* 'two', *tri* 'three', *četiri* 'four', and *oba* 'both'. Among them, only 'two' and 'both' show concord in gender with the noun: *dva* and oba for masculine and neuter nouns, and *dve/dvije* and *obe/obje* for feminine. A special kind of Q-Agree is reported as the only option: namely, 'two', 'three', 'four', and 'both' trigger paucal agreement, distinctive from the plural agreement by a different exponent on the participle.[1]

3. *Uninflecting quantifiers*

   Uninflecting quantifiers do not inflect for gender, therefore it is assumed that they do not agree with the noun in genitive. This is the case for quantifiers *mnogo* 'many/much', *malo* 'a little', *nekoliko* 'a few', and numerals *pet* 'five', and higher. According to the literature, agreement can alternate only with these QNPs, between the default N.SG and plural N-Agree, with a remark that N-Agree is an option for some speakers.

Contrary to previous reports, the data collected in this paper show more patterns than so far attested. For QNP subjects in neutral pre-verbal position, the alternation is available regardless of the type of quantifier.

The data was collected through a pilot-survey based on grammaticality judgements, on a 5-point scale (1 = completely bad, 5 = sounds excellent), reported here in form of average grades for every option. The judgements were given by 116 native speakers of Serbo-Croatian;[2] 75,7% non-linguists, and 24,3% linguists or philologists. The sentences are in past tense active or present tense passive, because they require the same auxiliary (*jesam* 'to be'), agreeing in number and person, and a participle, agreeing in number and gender with the subject.

2.1   Adjectival quantifiers

For adjectival quantifiers, features on the participle always match the features on both the noun and the quantifier, due to internal concord between the quantifier and the noun. These quantifiers do not assign

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[1]An overview of the exponents is given below, in Table 2.

[2]The participants were speakers of all major varieties of Serbo-Croatian: 79 from Serbia, 24 from Bosnia and Herzegovina, 8 from Croatia, and 5 from Montenegro.

genitive case and do not affect the form of the verb that predicates over the modified noun, hence, only N-Agree is available in these cases: if the noun is N.SG, as in (4a), so is the participle; if the noun is M.PL, only the M.PL option is grammatical (4b).

(4)   a.   Jedn-o   det-e   je   jel-o.
                one-N.SG.NOM child-N.SG.NOM AUX.3SG ate-**N.SG**
                'One child ate.'   (N-Agree)
    b.   Nek-i   mališan-i   su   jel-i   / *je   jel-o.
                some-M.PL.NOM toddler-M.PL.NOM AUX.3PL ate-**M.PL** / AUX.3SG ate-**N.SG**
                'Some toddlers ate.'   (N-Agree: 4,93 / default: 1,20)

2.2   Paucal-triggering quantifiers

As previously mentioned, there is a subgroup of quantifiers which consists of only four members, numerals 2–4 and 'both'.[3] Due to their special behaviour, we classify them as a separate group, between fully-agreeing adjectival and non-agreeing nominal quantifiers.

(5)   a.   Dv-a   marker-a   su   pal-a   / pal-i   / je   pal-o   sa
                two-M.PA marker-M.PA AUX.3PL fell-**M.PA** / fell-**M.PL** / AUX.3SG fell-**N.SG** from
                stola.
                table
                'Two markers fell from the table.'   (paucal: 4,75 / plural: 3,35 / default: 2,79)
    b.   Tri radnik-a   su   stajal-a   / stajal-i   / je   stajal-o   ovde.
                three worker-M.PA AUX.3PL stood-**M.PA** / stood-**M.PL** / AUX.3SG stood-**N.SG** here
                'Three workers were standing here.'   (paucal: 4,4 / plural: 3,43 / default: 2,95)

As shown by the examples in (5), the numerals 'both', 'two', 'three' and 'four' exhibit different behaviour when it comes to agreement, namely they induce the emergence of paucal on the participle.[4] Additionally, 'both' and 'two' inflect for gender, as shown in (5a), unlike 'three' and 'four', as shown in (5b). In addition, both plural and default are available (although with lower average rates) for these QNPs, contrary to what has been claimed in the literature.

2.3   Nominal quantifiers

Nominal quantifiers are similar to paucal-triggering quantifiers, in that they trigger Q-Agree on the participle, illustrated in (6a)[5] for 'sequence' and in (6b) for 'majority'. They have their own number and gender features, and thus behave as typical nouns. As mentioned above, the quantifying noun bears nominative case, whereas the quantified noun bears genitive case. Contrary to the reports by Wechsler

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[3]All higher, complex numerals ending in two, three and four exhibit the same behaviour as their simple counterparts.

[4]Šarić (2014) argues the paucal to be in fact neuter plural, because of the homophony of these two forms. This issue goes beyond the scope of this paper.

[5]An alternative interpretation in which the noun *avion* acts as the subject triggering M.SG on the participle was excluded by adding a disambiguating converb construction. Acceptability judgements are based on (i) below.

(i)   Niz-∅   stvar-i: je   ugrozio-∅   / su   ugrozil-e   / je
       sequence-M.SG.NOM thing-F.PL.GEN AUX.3SG jeopardised-**M.SG** / AUX.3PL jeopardised-**F.PL** / AUX.3SG
       ugrozil-o   avion, dovevši do njegovog pada.
       jeopardised-**N.SG** plane brought to its   fall
       'A number of issues jeopardised the plane, causing it to fall.'

and Zlatić (2000, 2003), QNPs with nominal quantifiers can also exhibit N-Agree and default, shown in (6a) and (6b).

(6) a. Niz-∅   stvar-i: je   ugrozio-∅   / su
     sequence-M.SG.NOM thing-F.PL.GEN AUX.3SG jeopardised-**M.SG** / AUX.3PL
     ugrozil-e   / je   ugrozil-o   avion.
     jeopardised-**F.PL** / AUX.3SG jeopardised-**N.SG** plane
     'A number of issues jeopardised the plane.'

                     (Q-Agree: 4,27 / N-Agree: 3,13 / default: 4,05)

   b. Većin-a   klijenat-a: je   kupil-a   / su   kupil-i   /
     majority-F.SG.NOM client-M.PL.GEN AUX.3SG bought-**F.SG** / AUX.3PL bought-**M.PL** /
     je   kupil-o   knjigu.
     AUX.3SG bought-**N.SG** book
     'The majority of clients bought the book.'

                     (Q-Agree: 4,18 / N-Agree: 2,92 / default: 2,86)

2.4 Uninflecting quantifiers

For the uninflecting quantifiers, illustrated by the examples below, Bošković (2003); Šarić (2014); Wechsler and Zlatić (2000, 2003) and others claim N-Agree to be available for some speakers as an alternative to the default pattern. The speakers' judgements in our case do show the default to be slightly better, which is a general tendency for all quantifiers.

(7) a. Mnogo godin-a: je   prošl-o   / su   prošl-e   otad.
     many   year-F.PL.GEN AUX.3SG passed-**N.SG** / AUX.3PL passed-**F.PL** since then
     'Many years have passed since then.'   (default: 4,29 / N-Agree: 3,03)

   b. Nekoliko novinar-a: je   napadnut-o   / su   napadnut-i
     few   journalist-M.PL.GEN AUX.3SG attacked-**N.SG** / AUX.3PL attacked-**M.PL**
     juče.
     yesterday
     'A few journalists were attacked yesterday.'   (default: 3,61 / N-Agree: 2,86)

The availability of N-Agree could be argued to arise as the result of re-analysing uninflecting quantifiers as their adjectival counterparts, e.g. *mnoge* in (7a). Similar acceptability scores, however, are found with numerals 'five' and above, for which, crucially, no adjectival version exists, see (8).

(8) Sedam zečić-a   je   gledal-o   / su   gledal-i   uplašeno u svog
     seven   bunny-M.PL.GEN AUX.3SG looked-**N.SG** / AUX.3PL looked-**M.PL** fearfully in their
     vlasnika.
     owner
     'Seven bunnies were fearfully looking at their owner.'   (default: 4,78 / N-Agree: 3,71)

Uninflecting quantifiers are thus the only group of quantifiers in Serbo-Croatian for which agreement alternates only between the default N.SG and plural N-Agree, as shown in (7a) and (7b).

2.5 Interim summary

All cases considered, there is consistent variation within QNP agreement in Serbo-Croatian between Q-Agree (singular or paucal), default N.SG, and plural (N-Agree) on the other. The relational properties

between the quantifier and the embedded noun, as well as the attested agreement patterns with QNP in pre-verbal position, can be summarised as in Table 1 (the exclamation point indicates new observations).

Type of quantifier ‖	GENITIVE	concord	N-Agree	Q-Agree	default
adjectival	✗	✔	✔	✗	✗
'two', 'both'	✔	✔	✔!	✔	✔!
'three', 'four'	✔	✗	✔!	✔	✔!
nominal	✔	✗	✔!	✔	✔!
uninflecting	✔	✗	✔	✗	✔

Table 1: Agree, concord and genitive with QNPs (to be revised)

Several new observations can be made from Table 1. First, contrary to previous claims, both N-Agree and default in Serbo-Croatian can occur with all quantifiers. Second, at least in the context of QNPs, there seems to be no correlation between N-Agree and genitive case assignment – the genitive does not render the features of the noun invisible for agreement. Third, there is a correlation between concord and genitive case assignment (except for 'two', 'both') – genitive case in marked on the noun if the quantifier does not show concord.

3 Case and agreement – previous analyses

3.1 Case-based accounts and attraction theories

Franks (1994); Pesetsky (1982) and Bošković (2003, 2006) derive agreement alternations with QNPs from positional differences (a high position which enables spec-head agreement and a low position which does not), resulting from a categorical distinction (DP/NP vs. QP) and/or the need to acquire (nominative) case. They focus on adjectival quantifiers, which allow only one agreement option (PL), and uninflecting quantifiers (5 and up), which allow for an additional default SG agreement option. While for Russian Pesetsky (1982) and Franks (1994) diagnose a height difference between agreeing subjects (PL) and non-agreeing subjects (SG), based on different subjecthood tests such as binding, control, and COMP-trace effects, the agreement alternations in Serbo-Croatian do not seem to be sensitive to different pre-verbal positions of the subject. There is, however, a restriction that arises from pre-verbal vs. post-verbal subject positions – an effect we will make use of in our own account. Agreeing subjects in Russian, they argue, move to a high position to receive case, while non-agreeing subjects stay low because, by assumption, they do not need case. In contrast, Serbo-Croatian subjects move to a higher position in any case, but agreement fails for independent reasons, resulting in default SG agree.

Bošković (2006) drops the categorical difference and ties the agreement option to case: nominative case assignment and ϕ-agreement are licensed in SpecIP. Thus, uninflecting quantifiers in Russian trigger PL agreement if they get assigned zero nominative marking, while case-less uninflecting quantifiers trigger default SG marking. For Serbo-Croatian, Bošković (2003) proposes that case assignment does not have to be licensed in a specific position. Rather, uninflecting quantifiers are always case-less and trigger default SG agreement, whereas PL agreement arises as a special form of "semantic" agreement. For Šarić (2014), the default N.SG with uninflecting quantifiers results from the featural deficiency of these lexical items.

Semantic agreement corresponds to the N-Agree option, described in the previous section. As is shown in the examples in section 2, not only number but also gender is exponed by the participle. Since the meaning of the embedded noun cannot be argued to encode natural feminine gender, it must

be grammatical gender information that the participle expresses. An example with a nominal quantifier that excludes a natural gender interpretation is repeated in (9).

(9)   Niz-∅   stvar-i: je   ugrozio-∅   / su
        sequence-M.SG.NOM thing-F.PL.GEN AUX.3SG jeopardised-**M.SG** / AUX.3PL
        ugrozil-e   / je   ugrozil-o   avion.
        jeopardised-**F.PL** / AUX.3SG jeopardised-**N.SG** plane
        'A number of issues jeopardised the plane.'   (Q-Agree: 4,27 / N-Agree: 3,13 / default: 4,05)

Since N-Agree tracks gender features in (9), also (5a) and (7a), an analysis based on semantic agreement is untenable. Grammatical gender information has to be transferred onto the participle by a syntactic mechanism and cannot be the result of QNP interpretation.

     A further problem emerges with the third option occurring with nominal and paucal quantifiers, shown in subsection 2.2 and subsection 2.3. Since case-based approaches focus on the difference between adjectival quantifiers, for which only N-Agree is available, and uninflecting quantifiers, which alternate between N-Agree and default, a third option such as Q-Agree for nominal quantifiers and PAUC for paucal quantifiers is, without further assumptions, not accounted for.

     Finally, another argument against semantic N-Agree can be brought forward with respect to topicalisation, a syntactic operation which seems to be able to block N-Agree, as the following examples show.[6,7]

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[6]The low average grades of the topicalisation examples all-in-all might be a consequence of the design of the pilot-study itself. Namely, these structures contain a word order rather unusual for sentences uttered out-of-the-blue, as these examples were presented to the speakers without any context. We expect higher acceptability rates if presented with suitable contexts, such as in (i). Nevertheless, a dispreference for N-Agree with respect to other agreement options in the examples in (10) is noticeable.

(i)   *Context:* At a promotion event for a new book about nutrition, primarily intended for the author's clients but also open to the public, A asks B how many books were sold to the clients.
        A: Jes-u   li   sv-i   klijent-i   kupil-i   knjig-u?
             AUX.3PL PART all-M.PL.NOM client-M.PL.NOM bought-M.PL book-F.SG.ACC
             'Did all the clients buy the book?'
        B: Klijenat-a: je   knjigu kupil-a   većin-a,   ali bil-o   je   i
             client-M.PL.GEN AUX.3SG book   bought-**F.SG** majority-F.SG.NOM but were-N.SG AUX.3SG and
             nek-ih   drug-ih   kupac-a.
             some-M.PL.GEN other-M.PL.GEN buyer-M.PL.GEN
             'As for the clients, the majority of them bought the book, but there were some other buyers, too.'

B's answer not only addresses A's question but signals the presence of a more general question salient in the context of the form *How many of who bought the book?* This interpretation is in line with contrastive topics in English, discussed by Büring (2003) and Wagner (2012).

[7]The attentive reader will notice that topics are split in post-verbal position, while the baseline presents a pre-verbal subject position. The subject position with respect to the participle indeed plays an important role in the current theory and will be addressed in more detail in the next section.

(10) Većin-a   klijenat-a: je   kupil-a   / su   kupil-i   /
      majority-F.SG.NOM client-M.PL.GEN AUX.3SG bought-**F.SG** / AUX.3PL bought-**M.PL** /
      je   kupil-o   knjigu.
      AUX.3SG bought-**N.SG** book
      'The majority of clients bought the book.'   (Q-Agree: 4,18 / N-Agree: 2,92 / default: 2,86)

    a. Klijenat-a: je   knjigu kupil-a   većin-a.
        client-M.PL.GEN AUX.3SG book   bought-**F.SG** majority-F.SG.NOM
        'As for the clients, the majority of them bought the book.'   (Q-Agree: 2,24)

    b. *Klijenat-a: su   knjigu kupil-i   većin-a.
        client-M.PL.GEN AUX.3PL book   bought-**M.PL** majority-F.SG.NOM
        'As for the clients, the majority of them bought the book.'   (N-Agree: 1,5)

    c. Klijenat-a: je   knjigu kupil-o   većin-a.
        client-M.PL.GEN AUX.3SG book   bought-**N.SG** majority-F.SG.NOM
        'As for the clients, the majority of them bought the book.'   (default: 2,69)

If N-Agree were the result of the semantic interpretation of QNPs, we would not expect it to be sensitive to topicalisation, contrary to what (10) shows for nominal quantifiers.

The last point of this section concerns potential language processing accounts of agreement alternations with QNPs in Serbo-Croatian. A different way to explain the N-Agree option is to attribute the occurrence of number and gender features to attraction effects happening in speech processing and production (Badecker and Kuminiak 2007; Harrison 2004; Lorimor et al. 2008; Malko and Slioussar 2013; Ristić et al. 2016; Slioussar and Malko 2016). The sentence in (11) provides an example for number attraction in English.

(11)   Minority ownership of businesses are up.   (Lorimor et al. 2008: 772)

Under an attraction account, the Q-Agree option, shown in section 2, is the result of agreement with the hierarchically highest argument, whereas N-Agree is triggered by an erroneous agreement source in the local context.[8] Under such an analysis, the judgements in section 2 would suggest that attraction errors do not only occur in production, as previous studies have reported, but they also have a significant effect in acceptability judgements, since both agreement options seem to be equally available for most types of quantifiers. What is even more surprising under this view, however, is the low acceptability rate of N-Agree in the topicalised structures in (10). If attraction errors are due to a competing local agreement goal and the only linearly available goal is the embedded noun, attraction errors are expected to increase rather than decrease. On the contrary, what we find with structures like (10) is a clear preference for Q-Agree and default.

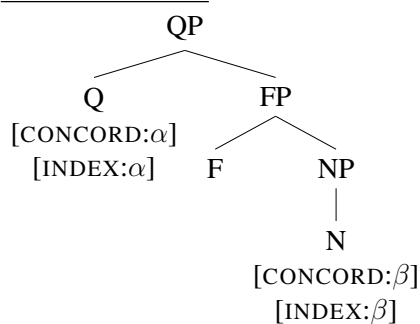## 3.2   Two sets of ϕ-features: Danon (2013)

Based on the observation that agreement in Modern Hebrew alternates between Q-Agree and N-Agree, Danon (2013) adopts the proposal by Wechsler and Zlatić (2003), originally implemented in HPSG framework, that lexical items are specified with two distinct sets of ϕ-features. INDEX features reflect the noun's semantics, and are relevant to subject–predicate agreement. CONCORD features are related to the noun's morphology, and are relevant to NP-internal concord. Not only is it possible that CONCORD

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[8]The cited studies on this matter in Slavic languages report agreement attraction effects in a very specific context: the attractor noun is a part of a prepositional complement of the nominative head noun. The attractor is in singular, accusative case, formally identical with the nominative singular; the attraction effects are thus attributed to case ambiguity. If that is true, it is very surprising that the same effect would occur with nouns in genitive (plural), which is arguably very distinct from the nominative in Serbo-Croatian, see Table 2.
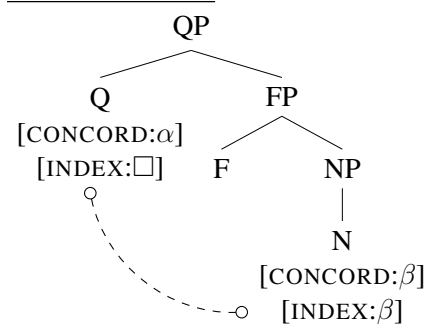
and INDEX features mismatch on one and the same lexical item, but any of them can enter the derivation unvalued. This is determined by an external mechanism,[9] related to the semantics of the entire sentence.

Quantifiers are assumed to take a case-assigning FP as a complement, which in turn takes NP as its complement. The chosen option of agreement depends on whether the features of Q enter the derivation valued or not. If they are valued, as in (12), the QNP's INDEX features get projected up from Q to get copied onto T. If the INDEX features of Q are unvalued when Q enters the derivation, as in (13), they get valued by the INDEX features of the embedded NP. The QNP still gets the INDEX features via Q, but now they originate on the noun. Depending on whether the quantifier enters into a concord relation with the noun, CONCORD features can additionally be unvalued on Q.

(12) Q-Agree pattern

$$
\begin{array}{c}
\text{QP} \\
\diagup \quad \diagdown \\
\text{Q} \qquad \text{FP} \\
[\text{CONCORD:}\alpha] \\
[\text{INDEX:}\alpha] \quad \text{F} \quad \text{NP} \\
\qquad\qquad | \\
\qquad\qquad \text{N} \\
\qquad\qquad [\text{CONCORD:}\beta] \\
\qquad\qquad [\text{INDEX:}\beta]
\end{array}
$$

(13) N-Agree pattern

$$
\begin{array}{c}
\text{QP} \\
\diagup \quad \diagdown \\
\text{Q} \qquad \text{FP} \\
[\text{CONCORD:}\alpha] \\
[\text{INDEX:}\square] \quad \text{F} \quad \text{NP} \\
\qquad\qquad | \\
\qquad\qquad \text{N} \\
\qquad\qquad [\text{CONCORD:}\beta] \\
\qquad\qquad [\text{INDEX:}\beta]
\end{array}
$$

Danon's (2013) system is, thus, free of assuming structural ambiguity of QNPs in alternating QNP agreement patterns (in contrast to case-based approaches), but it requires a complex feature system and an additional external mechanism to constrain the valuing of the INDEX features on the quantifier. An important suggestion is made for default agreement in Serbo-Croatian: agreement is always successful, and default is a result of a fixed N.SG default value for the INDEX feature of Q head. This system does not tie successful ϕ-agreement to the presence of a case feature and default agreement to the absence of a case feature as previous analyses have done. Rather, ϕ-agreement always happens with the entire QP, which is marked for nominative and gets its INDEX feature from Q.

One potential counter-argument against this type of approach can be raised with respect to the exponents of CONCORD and INDEX features. In cases where we see concord between the quantifier and the noun, as well as Q-Agree on the participle, the exponents on the quantifier and the participle are identical, see (14) for an example with paucal quantifiers. If there were different slots for INDEX and CONCORD features, one would potentially expect different exponents for CONCORD and INDEX agreement.

(14) Dv-a   marker-a   su   pal-a   / pal-i   / je   pal-o   sa   stola.
       two-**M.PA** marker-M.PA AUX.3PL fell-**M.PA** / fell-**M.PL** / AUX.3SG fell-**N.SG** from table
       'Two markers fell from the table.'   (paucal: 4,75 / plural: 3,35 / default: 2,79)

---

[9] See Landau (2015) for another application of INDEX and CONCORD features in Hebrew.

Table 2 provides an overview for the exponents on quantifiers, nouns and participles. Of the paucal-triggering quantifiers, only only 'two' and 'both' inflect: -e for F and -a for M and N.

	(nom.) Qs			nouns						participle		
	masc	fem	neut	masc		fem		neut		masc	fem	neut
				nom	gen	nom	gen	nom	gen			
SG	∅	-a	-o/-e	∅	-a	-a	-e:	-o/-e	-a	∅[10]	-a	-o/-e
PL	-i	-e	-a	-i	-a:	-e	-a:	-a	-a:	-i	-e	-a
PA[11]	-a	-e:	-a	–	-a	–	-e:	–	-a	-a	-e	-a

Table 2: Number, gender and case exponents in Serbo-Croatian

A second, more serious, problem arises with default agreement. A possible scenario for default insertion to be required would be an unvalued INDEX feature on Q. However, there is no way Q can ever end up with INDEX:□ after it is merged with FP, since Q either contributes its own feature or relies on N for INDEX to be valued. Default can therefore not result from an unvalued INDEX feature.

Additional problems for the Danon system emerge with quantifiers that show concord and undergo NP-topicalisation, i.e. adjectival quantifiers and the paucal quantifiers 'two' and 'both', see (15) and (16). As was shown in (10), N-Agree is blocked if the QNP is discontinuous with the quantifier occuring in the left periphery. The unavailability of N-Agree can be accounted for under the assumption that topic splits are base-generated: if there is no step in the derivation in which the quantifier and the embedded noun are merged in a sufficiently local configuration, there is no way for Q to value its INDEX feature by N. While this solution might work for nominal quantifiers in (10) which do not show concord with the embedded noun, (15) and (16) strongly suggest that quantifier and noun start-off in a local configuration and are subsequently split via movement.

(15) Marker-a   su   / je   sa stola pal-a   / *pal-i   / pal-o   dv-a.
      marker-M.PA AUX.3PL / AUX.3SG from table fell-**M.PA** / fell-**M.PL** / fell-**N.SG** two-M.PA
      'As for markers, two of them fell from the table.'

                                        (paucal: 2,96 / plural: 1,56 / default: 2,58)

(16) Mališan-i   su   jel-i   / *je   jel-o   nek-i.
      toddler-M.PL AUX.3PL ate-**M.PL** / AUX.3SG ate-**N.SG** some-M.PL
      'As for toddlers, some of them ate.'   (N-Agree / *default)

There is further independent evidence against base-generation, arguing in favour of topicalisation as feature-driven syntactic movement. Topicalised NPs e.g. reconstruct for binding. In (17), the possessive is bound by the quantifier, requiring the topicalised NP to be interpreted in its base position.[12]

---

[5]The exponent for MASC.SG on the participle is -∅, but the actual forms have a phonologically derived word-final /o/, originating from /l/.

[6]Despić (2013) argues that paucal quantifiers assign NOM.PA to the noun, this resulting in paucal agreement, because only NOM can trigger agreement in Serbo-Croatian. If so, sentences with plural on the participle would be ungrammatical. But that's not true, see (5a), (5b).

[12]Depending on whether Serbo-Croatian shows weak crossover effects, binding could also be established via quantifier raising in (17). Fortunately, Serbo-Croatian draws a distinction between a reflexive possessive, *svoj-* in (17), and its non-reflexive counterpart. Only the reflexive possessive has to be locally bound (Despić 2015). Thus, we can control for the QR structure by using the reflexive possessive pronoun and substituting the quantifier with a proper noun, see (i).

(i)   Svoj-ih$_{i/*j}$ / Njen-ih$_{i/j}$ klijenat-a: Sara$_i$ mrzi   većin-u.
      REFL.POSS-M.PL.GEN / POSS-M.PL.GEN client-M.PL.GEN Sara-F.SG.NOM hate.3SG majority-F.SG.ACC
      'As for her$_{i/j}$ clients, Sara$_i$ hates the majority of them.'

(17)   Svoj-ih$_i$ klijenat-a: [svak-i   advokat-∅]$_i$ mrzi
REFL.POSS-M.PL.GEN client-M.PL.GEN every-M.SG.NOM attorney-M.SG.NOM hate.3SG
većin-u.
majority-F.SG.ACC
'As for his$_i$ clients, [every attorney]$_i$ hates the majority of them.'

Additional evidence for movement comes from observations considering syntactic islands such as relative clauses and coordinations. Compare (18) to (19), where topicalisation seems to be blocked if moved out of a a complex noun phrase. Note that split topics are not clause-bound per se, as (20) shows.

(18)   Advokat-∅   mrzi   novinar-a   koj-i   je
attorney-M.SG.NOM hate.3SG journalist-M.SG.ACC REL.PRO-M.SG.NOM AUX.3SG
intervjuisao-∅   većin-u   njegov-ih   klijenat-a:.
interviewed-M.SG majority-F.SG.ACC his-M.PL.GEN client-M.PL.GEN
'The attorney hates the journalist who interviewed the majority of his clients.'

(19)   *Njegov-ih   klijenat-a: advokat-∅   mrzi   novinar-a
his-M.PL.GEN client-M.PL.GEN attorney-M.SG.NOM hate.3SG journalist-M.SG.ACC
koj-i   je   intervjuisao-∅   većin-u.
REL.PRO-M.SG.NOM AUX.3SG interviewed-M.SG majority-F.SG.ACC
'As for his clients, the attorney hates the journalist who interviewed the majority of them.'

(20)   Svoj-ih   klijenat-a: advokat-∅   kaže   da   mrzi
REFL.POSS-M.PL.GEN client-M.PL.GEN attorney-M.SG.NOM say.3SG COMP hate.3SG
većin-u.
majority-F.SG.ACC
'As for his clients, the attorney says he hates the majority of them.'

Extraction out of conjuncts is equally degraded, compare (21) to (22).[13]

(21)   Advokat-∅   je   imao-∅   mnogo olovak-a: i   nekoliko
attorney-M.SG.NOM AUX.3SG had-M.SG many   pen-F.PL.GEN and few
svezak-a:.
notebook-F.PL.GEN
'The attorney had many pens and a few notebooks.'

(22)   *Svezak-a: je   advokat-∅   imao-∅   mnogo olovak-a: i
notebook-F.PL.GEN AUX.3SG attorney-M.SG.NOM had-M.SG many   pen-F.PL.GEN and
nekoliko.
few
'As for the notebooks, the attorney had many pens and a few of them.'

Split topic structures are information structurally marked, they require a context in which the referent of the noun is not only previously mentioned but also contrasts with another alternative in the context, see footnote 6. In line with many movement accounts on topicalisation (Authier 1991; Chomsky 1977; Frascarelli and Hinterhölzl 2007; Frey 2006; Grohmann 2003; Miyagawa 2017; Rivero 1978), we

---

[13]We provide an example where extraction takes place from the second conjunct for two reasons: (i) extraction from the first conjunct creates an alternative parse, a clausal coordination where topicalisation takes place in both conjuncts, and (ii) first conjunct extraction has been shown to be in fact possible in Serbo-Croatian (Arsenijević et al. 2016; Franks and Peti-Stantić 2006).

propose a left peripheral head, either C or a dedicated TOP head, carrying a feature [•TOP•] which attracts contrastive topics to its specifier.

Having established that topic splits are derived by movement, the ban on N-Agree in (10b) on the one hand and the concord data from (15) and (16) on the other forces one to assume that extraction takes place after CONCORD but before INDEX features are valued on the quantifier. However, as we argued above and in footnote 6, topic splits are feature-triggered by a left peripheral head which arguably enters the derivation to late to extract the quantifier before it can undergo INDEX agreement.

The final observation with respect to Danon's (2013) proposal relates to the position of the participle. If the QNP follows the participle, only Q-Agree and default are available – a configuration that has not received much attention in the literature.[14] This is illustrated in the following examples, in (23) for the paucal-triggering 'three', in (24) for the nominal 'majority', and for uninflecting quantifiers in (25), for 'six'. Since Danon locates the source of the agreement alternations on the INDEX feature of Q, there is no way to account for a pre-verbal v. post-verbal distinction.

(23) Isporučen-a   su   / *isporučen-i   su   / isporučen-o   je   tri
      delivered-**M.PA** AUX.3PL / delivered-**M.PL** AUX.3PL / delivered-**N.SG** AUX.3SG three
      kačket-a.
      cap-M.PA
      'Three caps were delivered.'   (paucal: 4,1/ plural: 1,57 / default: 3,58)

(24) Na nju je   lajal-a   / *su   lajal-i   / je   lajal-o
      at her AUX.3SG barked-**F.SG** / AUX.3PL barked-**M.PL** / AUX.3SG barked-**N.SG**
      većin-a   pas-a:.
      majority-F.SG dog-M.PL.GEN
      'The majority of dogs barked at her.'   (Q-Agree: 4 / N-Agree: 1,97 / default: 2,94)

(25) U prvoj smeni je   radil-o   / *su   radil-i   šest konobar-a:.
      in first shift AUX.3SG worked-**N.SG** / AUX.3PL worked-**M.PL** six waiters-M.PL.GEN
      'Six waiters worked in the first shift.'   (default: 4,58 / N-Agree: 1,67)

Summing up, Danon's INDEX-CONCORD agreement system is able to account for the various agreement patterns that can be found with different types of quantifiers in Serbo-Croatian. However, the theory overgenerates with respect to the post-verbal data given in (23)–(25), while it undergenerates generally in terms of default agreement. Moreover, the account has to assume a counter-cyclic topicalisation operation to derive the agreement options in (10) and concord in (15) and (16).

4 Key observation

The pre-verbal data from section 2, together with the post-verbal structures, given in (23)–(25), constitute an agreement pattern that is reminiscent of closest vs. highest conjunct agreement in South Slavic (Bošković 2009; Corbett 1991; Marušič et al. 2015; Willer-Gold et al. 2016). The structures in (26)–(31) present the basic pattern for nominal quantifiers with minimal examples: while agreement with QNPs in the pre-verbal position can alternate between Q-Agree, N-Agree, and default, as shown in (26)–(28), subject QNPs positioned post-verbally only allow for Q-Agree and default, cf. (29)–(31).

(26) Niz-∅   stvar-i: je   ugrozio-∅   avion.
      sequence.M.SG.NOM thing-F.PL.GEN AUX.3SG jeopardised-**M.SG** plane

---

[14]Although see Pesetsky (1982) who motivates a categorical distinction based on the pre-verbal–post-verbal asymmetry for N-Agree with uninflecting quantifiers in Russian.

'A number of issues jeopardised the plane.' (Q-Agree: 4,27)

(27) Niz-∅ stvar-i: su ugrozil-e avion.
sequence.M.SG.NOM thing-F.PL.GEN AUX.3PL jeopardised-**F.PL** plane

'A number of issues jeopardised the plane.' (N-Agree: 3,13)

(28) Niz-∅ stvar-i: je ugrozil-o avion.
sequence.M.SG.NOM thing-F.PL.GEN AUX.3SG jeopardised-**N.SG** plane

'A number of issues jeopardised the plane.' (default: 4,05)

(29) Avion je ugrozio-∅ niz-∅ stvar-i:.
plane AUX.3SG jeopardised-**M.SG** sequence-M.SG thing-F.PL.GEN

'A number of issues jeopardised the plane.' (Q-Agree: 4,71)

(30) *Avion su ugrozil-e niz-∅ stvar-i:.
plane AUX.3PL jeopardised-**F.PL** sequence-M.SG thing-F.PL.GEN

'A number of issues jeopardised the plane.' (N-Agree: 1,28)

(31) Avion je ugrozil-o niz-∅ stvar-i:.
plane AUX.3SG jeopardised-**N.SG** sequence-M.SG thing-F.PL.GEN

'A number of issues jeopardised the plane.' (default: 3,01)

A similar observation can be made for uninflecting quantifiers on the one hand, where the default N.SG exponents are taken as instances of Q-Agree (Danon 2013), and paucal-triggering quantifiers on the other hand, under the assumption that paucal exponents in (5a), (5b), and (23) result from Q-Agree and plural exponents constitute N-Agree.

The parallel of QNP agreement to conjunct agreement is provided in (32)–(37), examples taken from Willer-Gold et al. (2016: 193).[15] Pre-verbal agreement with coordinated subjects can alternate between agreement with the first (32) or with the last conjunct (33), and resolved M.PL agreement (34).

(32) Sva sel-a i sve varošic-e su juče ništen-a.
all village-N.PL and all town-F.PL AUX.3PL yesterday destroyed-**N.PL**

'All villages and all towns were destroyed yesterday.' (N+F=N)

(33) Sva sel-a i sve varošic-e su juče ništen-e.
all village-N.PL and all town-F.PL AUX.3PL yesterday destroyed-**F.PL**

'All villages and all towns were destroyed yesterday.' (N+F=F)

(34) Sva sel-a i sve varošic-e su juče ništen-i.
all village-N.PL and all town-F.PL AUX.3PL yesterday destroyed-**M.PL**

'All villages and all towns were destroyed yesterday.' (N+F=M)

Post-verbally, agreement with the first conjunct and resolved agreement are available, see (35) and (36). However, agreement with the last conjunct of a post-verbal conjunct phrase is impossible, as shown in (37).

(35) Juče su ništen-a sva sel-a i sve varošic-e.
yesterday AUX.3PL destroyed-**N.PL** all village-N.PL and all town-F.PL

'All villages and all towns were destroyed yesterday.' (N=N+F)

---

[15] The coordination examples include adjectival quantifiers. Following the discussion above, this type of quantifier does not introduce agreement alternations on its own. The presence of adjectival quantifiers, thus, does not induce any additional variation in these examples.

(36) Juče   su   uništen-i   sva sel-a   i   sve varošic-e.
     yesterday AUX.3PL destroyed-**M.PL** all village-N.PL and all town-F.PL
     'All villages and all towns were destroyed yesterday.'   (*M=N+F*)

(37) *Juče   su   uništen-e   sva sel-a   i   sve varošic-e.
     yesterday AUX.3PL destroyed-**F.PL** all village-N.PL and all town-F.PL
     'All villages and all towns were destroyed yesterday.'   (*F=N+F*)

The agreement patterns for conjunct agreement are summarised in Table 3, while Table 4 provides an overview of the agreement patterns for QNPs.

	pre-V	post-V
First Conjunct	✔	✔
Last Conjunct	✔	✘
Resolution	✔	✔

Table 3: Conjunct agreement

	pre-V	post-V
Q-Agree	✔	✔
N-Agree	✔	✘
Default	✔	✔

Table 4: Agreement with QNPs

The similarity between conjunct agreement on the one hand and agreement with quantified noun phrases on the other suggests a unifying syntactic treatment of these phenomena. Whatever is responsible for the pre-verbal vs. post-verbal agreement distinction in conjunct agreement, should have a similar effect on agreement with QNPs. Hence, we turn to proposals that have recently been made for conjunct agreement in the next section.

5 QNPs as coordinations

We will discuss two types of accounts of conjunct agreement: one is based on the notion of agreement as a process that is distributed across different modules of grammar so that linear order can have an influence on the availability of agreement goals (Bhatt and Walkow 2013; Marušič et al. 2015), while the second account is purely syntactic and makes use of the idea that operations such as *Agree* and *Merge* can be applied in different orders if they are triggered by the same head (Assmann et al. 2015; Georgi 2014; Müller 2009; Murphy and Puškar 2018). Since the decision between agreement options in the latter approach happens strictly locally, syntactic operations such as topicalisation, which are arguably triggered at a late stage in the syntactic derivation, are predicted to not have an effect on N-Agree vs. Q-Agree. The distributional approach, however, derives the post-syntactic agreement pattern from output representations, in which topicalisation operations will make a difference. QNP topicalisation structures, thus, provide a unique window into the (post)-syntactic properties of pre-verbal vs. post-verbal agreement strategies in Serbo-Croatian.

For the following discussion, we will assume that QNPs have the structure shown in (39), parallel to what has been claimed for conjoined NPs (Johannessen 1998; Munn 1987), see (38).

(38) Conjunctions:

```
        &P
       /  \
     NP    &'
          /  \
         &    NP
```

(39) Quantified NPs:
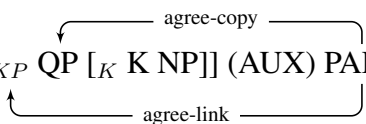
```
        KP
       /  \
     QP    K'
          /  \
         K    NP
```
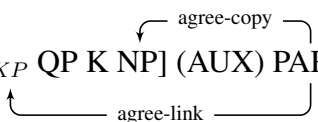
The functional head K assigns genitive case to to its complement, i.e. NP (see also Bošković 2006; Danon 2013), and takes QP as its specifier. Note that this assumption ties QNP agreement alternations

to the presence of genitive case. If there is only one agreement option, independent of the position of the participle, as it is the case with adjectival quantifiers, genitive case on the embedded noun is also absent, see Table 1. Both of those properties can be traced back to the absence of K, following the structure in (39), see subsection 5.3 for an extended discussion.

5.1 Agree Link & Agree Copy

Marušič et al. (2015) carry out experiments and confirm that the agreement pattern given in Table 3 also holds for Slovenian. Agreement in their system is a two-step process, in which first an *Agree-Link* is established in syntax between a probe and a suitable goal, a second step *Agree-Copy* then transfers ϕ values from goal to probe. Variation in terms of agreement strategies is accounted for by the relative timing of *Agree-Copy*, i.e. whether it happens in syntax or post-syntax. The participle first probes for the &P (or KP) via *Agree-Link*. Since the &P/KP has no features of its own, the probe continues searching inside the &P/KP. If *Agree-Copy*, as the next step, is established in syntax proper, the features of the first conjunct, i.e. the hierarchically closer goal, are copied onto the participle. If *Agree-Copy* is established in post-syntax, that is after linearisation, the last conjunct is the linearly closer goal agreeing with the participle. Below, (40) and (41) illustrate how this theory can account for the N-Agree/Q-Agree alternation in pre-verbal structures.

(40)   *Agree-Copy in syntax:* [$_{KP}$ QP [$_K$ K NP]] (AUX) PART PP

(41)   *Agree-Copy in post-syntax:* [$_{KP}$ QP K NP] (AUX) PART PP

In post-verbal configurations, the both hierarchically and linearly closest goal is the first conjunct. Structures (42) and (43) show how this reasoning translates into QNP configurations, modelled after (29) and (30):

(42)   *Agree-Copy in syntax:* PP (AUX) PART [$_{KP}$ QP [$_K$ K NP]]

(43)   *Agree-Copy in post-syntax:* PP (AUX) PART [$_{KP}$ QP K NP]

Marušič et al. (2015) draw an additional distinction between a *Peeking* and a *No-Peeking* Grammar. Resolved agreement results from the latter option in that an agreement probe is not allowed to probe further than the maximal projection of the conjunction (or KP in this case). Since &P/KP is not valued for gender, a default value, M.PL, gets inserted.[16]

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[16]Note that in this system M.PL is assumed to be the default value, both in Slovenian and Serbo-Croatian. The default value triggered by QNPs, however, is N.SG – a default that also arises in structures outside of QNP agreement such as impersonal sentences with dative subjects like (i).

(i)   Cel-og   dan-a   mi je   bil-o   hladn-o.
        all-M.SG.GEN day-M.SG.GEN I.dat AUX.3SG was-N.SG cold-N.SG
        'I was cold all day.'

This approach would thus have to assume two default values, one for coordinations, and another for QNPs. The account we will adopt in the next section will be able to derive M.PL and N.SG from different mechanisms.

The two-step Agree account can cover both agreement patterns, presented in Tables 3 and 4. Without any further assumptions, the theory makes an important prediction: since N-Agree is the result of post-syntactic *Agree-Copy*, it should be sensitive to additional syntactic displacement operations such as NP-topicalisation. As (44) shows, this prediction is not borne out. N-Agree is possible, despite NP not being the linearly closest goal. (45) provides the structure for (44b).

(44) Već-in-a   klijenat-a: je   kupil-a   / su   kupil-i   /
      majority-F.SG.NOM client-M.PL.GEN AUX.3SG bought-**F.SG** / AUX.3PL bought-**M.PL** /

      je   kupil-o   knjigu.
      AUX.3SG bought-**N.SG** book

      'The majority of clients bought the book.'   (Q-Agree: 4,18 / N-Agree: 2,92 / default: 2,86)

    a. Klijenat-a: je   već-in-a   kupil-a   knjigu.
            client-M.PL.GEN AUX.3SG majority-F.SG.NOM bought-**F.SG** book

            'As for the clients, the majority of them bought the book.'   (Q-Agree: 2,13)

    b. Klijenat-a: su   već-in-a   kupil-i   knjigu.
            client-M.PL.GEN AUX.3PL majority-F.SG.NOM bought-**M.PL** book

            'As for the clients, the majority of them bought the book.'   (N-Agree: 2,19)

    c. Klijenat-a: je   već-in-a   kupil-o   knjigu.
            client-M.PL.GEN AUX.3SG majority-F.SG.NOM bought-**N.SG** book

            'As for the clients, the majority of them bought the book.'   (Default: 2,21)

(45) NP (AUX) [$_{KP}$ QP K *<NP>*] PART PP
      topicalisation
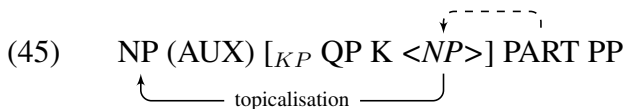
Note that topicalisation does not allow for N-Agree per se, as we have seen in the examples in (10b) and (15). Table 5 provides an overview of the agreement options available across syntactic configurations.

	pre-V	post-V	pre-V top	post-V top
Q-Agree	✔	✔	✔	✔
N-Agree	✔	✘	✔	✘
Default	✔	✔	✔	✔

Table 5: Agreement with QNPs, with topicalisation

In order to account for (44b), Marušič et al. (2015) would have to take topicalisation to be a PF-operation and order it after *Copy-Agree*. As a consequence, topicalisation has to take place after linearisation. While there are word order inducing operations ordered after linearisation, such as e.g. *Local Dislocation* (Embick and Noyer 2001), it is worth pointing out that post-linearisation operations are generally understood to rely on adjacency, hence must be maximally local.

To sum up, although the distributional agreement model can explain the pre-verbal vs. post-verbal agreement alternations, it needs to make additional assumptions in order to account for the availability of N-Agree in pre-verbal topicalisation configurations.

5.2 Order of operations

A purely syntactic account for the conjunct agreement patterns shown in Table 3 is proposed by Murphy and Puškar (2018).[17],[18] It builds on the idea that syntactic operations can be ordered freely, if they are triggered by the same functional head (Assmann et al. 2015; Georgi 2014; Müller 2009). Agreement variation is achieved by allowing the & head in &P to agree with the first conjunct, the last conjunct, neither one of them, or both of them.[19] After the ϕ-features of & have projected up to &P, the participle agrees with the entire &P. We adopt this model for QNP agreement, transferring the structure in (38) to the structure in (39).

The structure of KP is built using three basic operations: MERGE, ↑AGREE↑, and ↓AGREE↓, with the addition of MOVE, whose application or non-application derives the pre-verbal or the post-verbal word order.[20] The order of operations is here assumed to be free, however, once established, it has to be maintained throughout the derivation. This is ensured by the *Uniform Order of Operations* constraint, see (46), motivated by a similar idea from Assmann et al. (2015).

(46)   *Uniform Order of Operations*:
        If the order of operations $\alpha >> \beta >> \delta$ holds at a given stage of the derivation s_n, then there can be no stage of the derivation s_{n+1} which does not conform to this order.

                                                                                    (Murphy and Puškar 2018)

Two crucial assumption concern the status of MOVE: (i) it is not feature-driven and can only apply, if it feeds AGREE, and (ii) if it applies, its position is fixed, i.e. it is always the first operation that applies.[21] Probes can fail to agree (Preminger 2014), which will be important in orders #3 and #4, shown in (47).

Given the three elementary operations, MERGE, ↑AGREE↑ and ↓AGREE↓, the factorial typology derives the following six patterns for QNP agreement:

(47)   *Possible orders of operations and their outcomes*
        1.   ↑AGREE↑ >> MERGE >> ↓AGREE↓ $\Longrightarrow$ N-Agree
        2.   ↓AGREE↓ >> MERGE >> ↑AGREE↑ $\Longrightarrow$ Q-Agree
        3.   ↑AGREE↑ >> ↓AGREE↓ >> MERGE $\Longrightarrow$ Q-Agree
        4.   ↓AGREE↓ >> ↑AGREE↑ >> MERGE $\Longrightarrow$ Q-Agree
        5.   MERGE >> ↓AGREE↓ >> ↑AGREE↑ $\Longrightarrow$ default
        6.   MERGE >> ↑AGREE↑ >> ↓AGREE↓ $\Longrightarrow$ default

---

[17]Another syntactic approach was recently developed by Al Khalaf (2017) for *first conjunct* agreement languages such as Welsh, Biblical Hebrew, and Arabic, albeit with a *top-down* derivation.

[18]We do not discuss Bošković (2009, 2010), another relevant proposal for conjunct agreement alternations, since an extension to QNP agreement would predict preverbal Q-Agree and post-verbal default agreement to not be possible, contrary to what we find in Serbo-Croatian.

[19]The 'no feature' case gives rise to first conjunct agreement, while & agreeing with the features of both conjuncts results in resolved agreement.

[20]Murphy and Puškar (2018) define the operations as following:

(i)   *Structure building operations*:

        a.   MERGE – (External Merge) checks (c-)selectional features (●F●)
        b.   MOVE – (Internal Merge) applies freely, but only if it has a (positive) effect on outcome (cf. Chomsky 2001: 60f. on Object Shift).
        c.   ↓AGREE↓ – ('Downward' Head-Comp Agree) copies a feature value from a goal c-commanded by the probe
        d.   ↑AGREE↑ – ('Upward' Spec-Head Agree) copies a feature values from a goal m-commanded by the probe

[21]Note that what we characterize as MOVE is different from how we defined topicalisation, i.e. a feature triggered type of movement. The reason lies in the information structural impact the latter produces. No such effect is detectable for the former.

Case assignment is ignored here because the operation does not have any impact on the output other than it being required to be fed by MERGE.[22] In the rest of this section, we will show how the system can derive the agreement patterns given in Table 4.
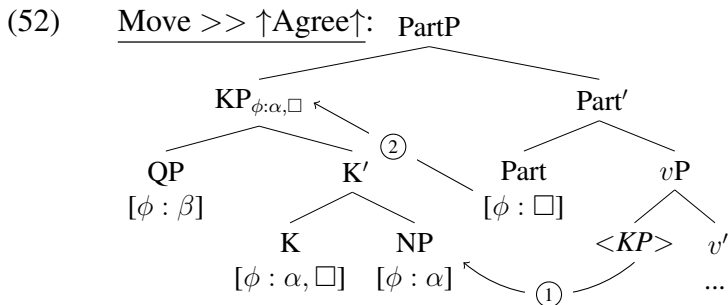
5.2.1 Order #1: Failure of ↑Agree↑ = N-Agree

In the first ordering permutation in (48), ↑Agree↑ applies first, and fails to find a goal, since MERGE has not yet applied, cf. (49). After MERGE has applied in (50), the probe on K performs ↓AGREE↓, this time successfully, cf. (51).

(48)   ↑AGREE↑ >> MERGE >> ↓AGREE↓

(49) ↑Agree↑:   (50) Merge: (51) ↓Agree↓:
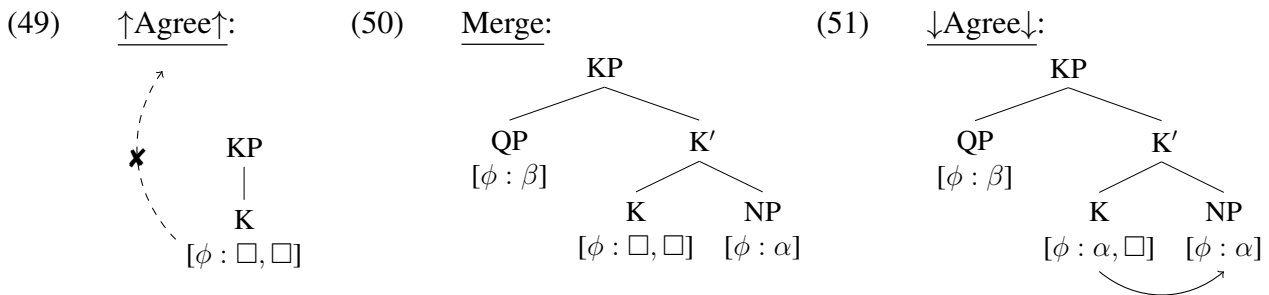
At the point when Part enters the derivation, the order of operations is maintained. MOVE takes place because it can feed Agree, shown in (52). The probe on Part performs ↑AGREE↑ and the ϕ-features originating from the noun appear on the verb, which correctly predicts the N-Agree option in pre-verbal cases.[23]

(52)   Move >> ↑Agree↑:

5.2.2 Order #2: Failure of ↓**Agree**↓ = Q-Agree

In the second order of operations, repeated in (53), ↓AGREE↓ fails to apply in (54). After merging the complement and the specifier (55), ↑AGREE↑ applies as the second chance for K to acquire a set of valued features, now from the QP (56).

(53)   ↓AGREE↓ >> MERGE >> ↑AGREE↑
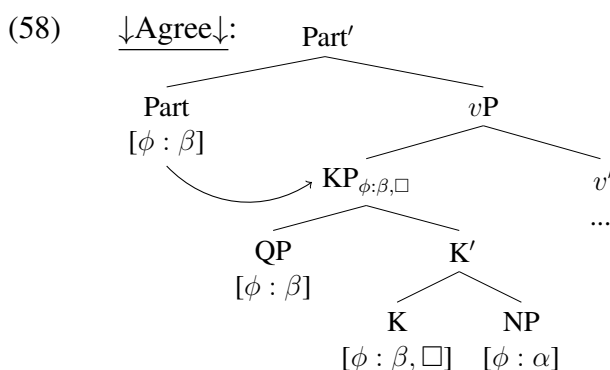
(54)   ↓Agree↓:   (55)   Merge: (56)   ↑Agree↑:

$$\text{KP} \quad\quad \text{KP} \quad\quad \text{KP}$$

(54) KP — K $[\phi : \square, \square]$

(55) KP: QP $[\phi : \beta]$; K′ → K $[\phi : \square, \square]$, NP $[\phi : \alpha]$

(56) KP: QP $[\phi : \beta]$; K′ → K $[\phi : \beta, \square]$, NP $[\phi : \alpha]$
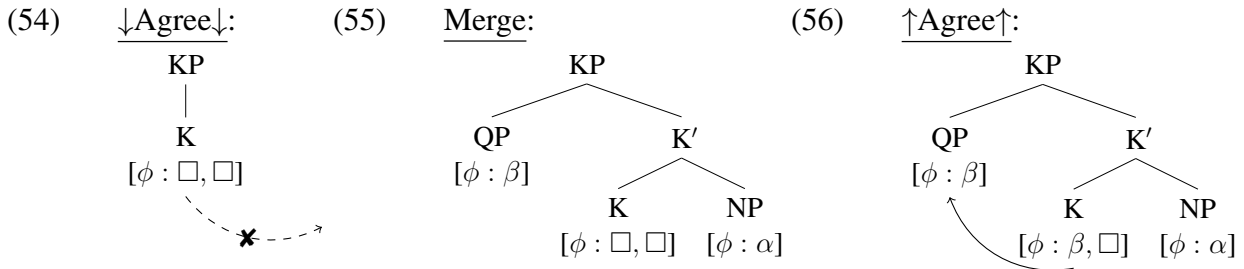
With the order of operations on Part maintained, MOVE cannot feed Agree, as in (57), therefore it does not apply.

(57)   Move >> ↓Agree↓:   PartP

PartP → KP$_{\phi:\beta,\square}$, Part′

KP$_{\phi:\beta,\square}$ → QP $[\phi : \beta]$, K′ → K $[\phi : \beta, \square]$, NP $[\phi : \alpha]$

Part′ → Part $[\phi : \square]$, vP → <KP> , v′ ...
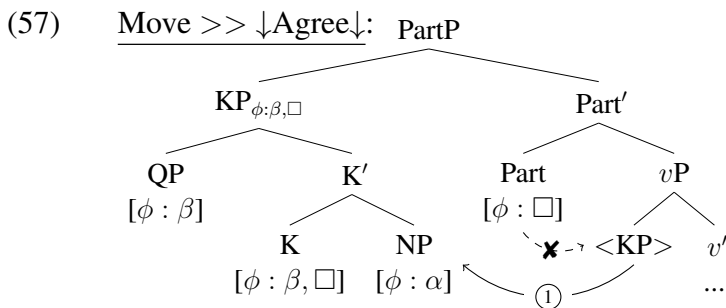
With the KP remaining in Spec,*v*, ↓Agree↓ applies successfully and the features of the quantifier appear on the participle, which correctly predicts that Q-Agree is available post-verbally. This step is shown in (58).

(58)   ↓Agree↓:   Part′

Part′ → Part $[\phi : \beta]$, vP

vP → KP$_{\phi:\beta,\square}$, v′ ...

KP$_{\phi:\beta,\square}$ → QP $[\phi : \beta]$, K′ → K $[\phi : \beta, \square]$, NP $[\phi : \alpha]$

5.2.3 Orders #3, #4: No valuation (resulting in Q-Agree)

The two orders of operations in which both ↓AGREE↓ and ↑AGREE↑ apply before MERGE equally result in a derivation where the features on K remain unvalued. With respect to order #3, shown in (59), ↑AGREE↑ precedes ↓AGREE↓, and both apply vacuously since neither the complement nor the specifier have been merged yet, cf. (60)–(61). Merging the arguments counter-feeds both Agree operations, and KP enters the next stage with both ϕ-slots unvalued, see (62).

(59) ↑AGREE↑ >> ↓AGREE↓ >> MERGE

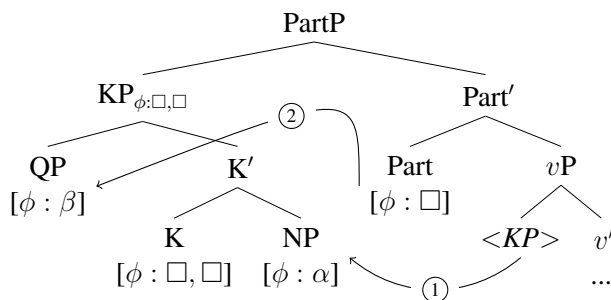(60) ↑Agree↑:
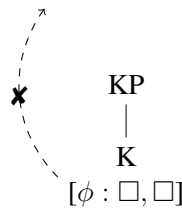
(61) ↓Agree↓:
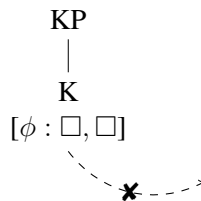
(62) Merge:
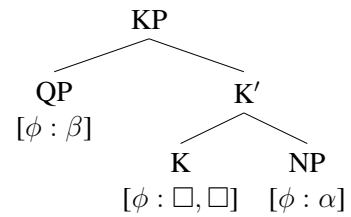
The derivation, however, does not crash, since probes can fail to agree. MOVE can feed Agree, so that when Part probes for ϕ-features, it *peeks* into KP, where the highest goal it finds is QP, shown in (63).
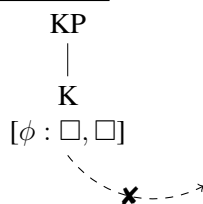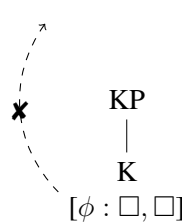
(63) Move >> ↑Agree↑:

KP, similarly, ends up with two unvalued feature slots if the order of Agree operations is reversed, as the order in (64) requires. Again, MERGE counter-feeds both ↓AGREE↓ and ↑AGREE↑, see (65)–(67).

(64) ↓AGREE↓ >> ↑AGREE↑ >> MERGE
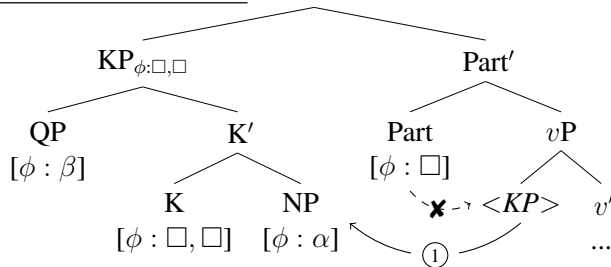
(65) ↓Agree↓:

(66) ↑Agree↑:

(67) Merge:
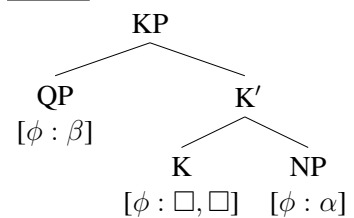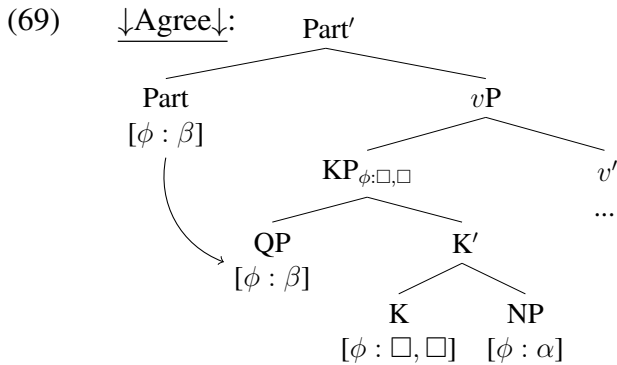
In this scenario, however, MOVE would bleed Agree, since its application would destroy the context for ↓Agree↓ to apply, see (68).

(68) Move >> ↓Agree↓: PartP

Thus, MOVE does not apply. The subject KP stays in Spec,vP, as shown in (69). Again, Part *peeks* into

KP, in which the highest goal is QP, and agrees with it.

(69) $\underline{\downarrow\text{Agree}\downarrow}$:

Tree:
Part′
- Part [$\phi : \beta$]
- vP
  - KP$_{\phi:\square,\square}$
    - QP [$\phi : \beta$]
    - K′
      - K [$\phi : \square,\square$]
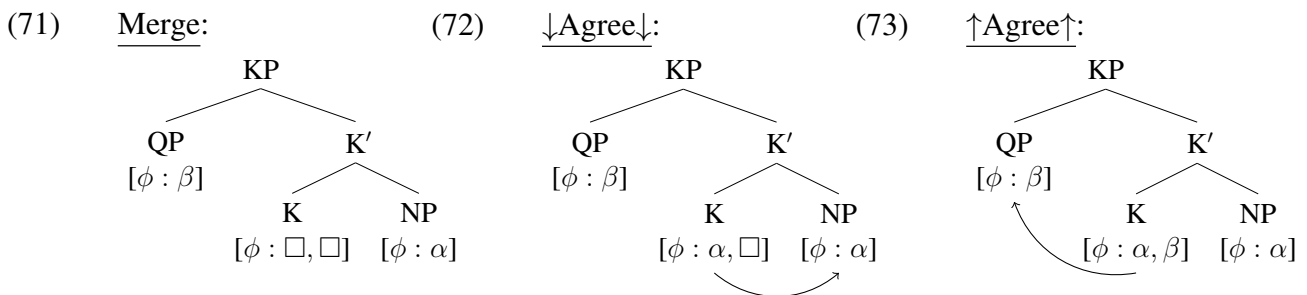   - NP [$\phi : \alpha$]
  - v′ ...

The four orders discussed so far give the following results: order #1 derives pre-verbal N-Agree, while the other three orders result in Q-Agree, order #3 pre-verbally, and orders #2 and #4 post-verbally. There is no order of operations in this system that predicts N-Agree post-verbally.
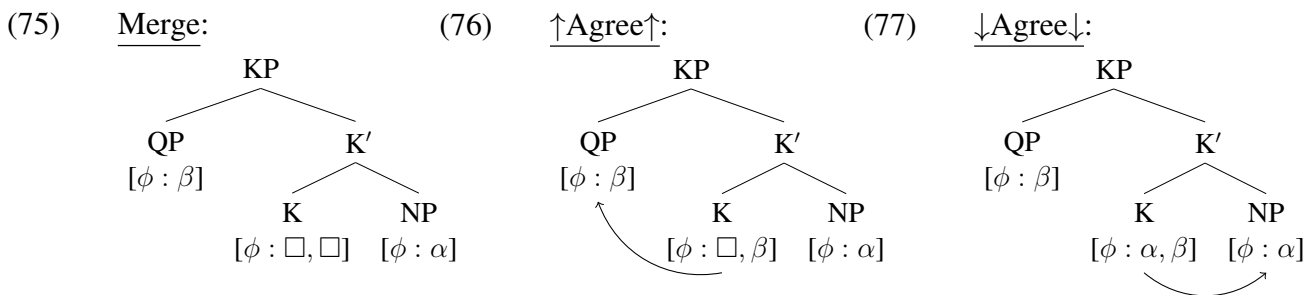
5.2.4 Orders #5, #6: Multiple valuation (= Default)

If MERGE is ordered before both ↓AGREE↓ and ↑AGREE↑, required by the order in (70), both Agree operations succeed, shown in (72)–(73). This will lead to a clash of features in the post-syntactic component.

(70) MERGE >> ↓AGREE↓ >> ↑AGREE↑

(71) Merge: KP — QP [$\phi:\beta$], K′ — K [$\phi:\square,\square$], NP [$\phi:\alpha$]

(72) ↓Agree↓: KP — QP [$\phi:\beta$], K′ — K [$\phi:\alpha,\square$], NP [$\phi:\alpha$]

(73) ↑Agree↑: KP — QP [$\phi:\beta$], K′ — K [$\phi:\alpha,\beta$], NP [$\phi:\alpha$]

Reversing the order of the two Agree operations, see (74), produces the same result. Since MERGE has applied first, the K head agrees with both QP and NP, so that it projects two sets of ϕ-features, see (75)–(77).

(74) MERGE >> ↑AGREE↑ >> ↓AGREE↓

(75) Merge: KP — QP [$\phi:\beta$], K′ — K [$\phi:\square,\square$], NP [$\phi:\alpha$]

(76) ↑Agree↑: KP — QP [$\phi:\beta$], K′ — K [$\phi:\square,\beta$], NP [$\phi:\alpha$]

(77) ↓Agree↓: KP — QP [$\phi:\beta$], K′ — K [$\phi:\alpha,\beta$], NP [$\phi:\alpha$]

In contrast to Marušič et al. (2015), Murphy and Puškar (2018) derive M.PL via an optimality-theoretic

constraint interaction (Prince and Smolensky 1993) in post-syntax, giving rise to *Resolved Agreement*.[24] The system of resolution is based on the *Markedness Hierarchy of Gender* (Andrews 1990; Stankiewicz 1986), where M is unmarked. In post-syntax every other gender value is deleted, and masculine arises as an *Emergence of the Unmarked* effect (McCarthy and Prince 1994).

For QNP agreement, there is no M.PL resolution in agreement, instead we observe N.SG default agreement. We propose that the OT resolution is not available for QNPs. The reason might lie in the different nature of the agreeing heads. While the & head only agrees with its conjuncts, the K head also assigns genitive case to its complement. Moreover, & and K differ in their semantics, in that only the former requires the conjuncts to form a plurality and thus arguably need ϕ-feature values to resolve. We argue that unresolved feature clashes lead to spell-out dilemmas which result in insertion of the default value N.SG. This step provides an explanation as to why two different feature values can be triggered by the same feature set-up, that is why two different mechanisms can be employed to resolve the same feature conflict. Marušič et al. (2015), however, would have to postulate two default values, one for coordinations and one for QNPs.

## 5.3 Predictions and open questions

As the previous section has shown, N-Agree is only possible if QNPs precede participles. Since the only order of operations which allows for N-Agree (order #1) is an order which triggers MOVE to a pre-verbal position, the lack of N-Agree in post-verbal position is accounted for. Q-Agree can be achieved either in pre-verbal or in post-verbal position. The former results from order #3 and the latter is a consequence of orders #2 or #4. Default agree is possible pre- and post-verbally as well, the former is derived by order #6 and the latter by order #5.

A crucial advantage of this system over the distributional account, presented in subsection 5.1, is its locality restriction, leaving the agreement pattern unaffected by further movement operations which are not relevant in the local environment. Note that the topicalisation data presented in (10), which disallow N-Agree, are cases of post-verbal agreement, while topicalisation in the pre-verbal structure in (44) allows for N-Agree. Since NP extraction happens at an arguably late stage of the syntactic derivation, all that counts for the availability of N-Agree is whether KP precedes or follows the participle. Hence, the (non-)availability of N-Agree under topicalisation is derived without any further assumptions.
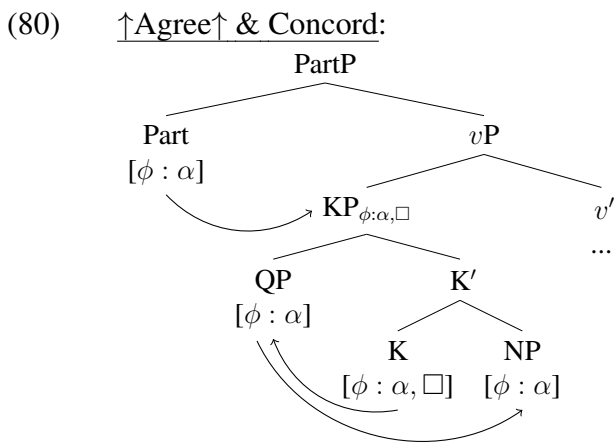
The current system systematically predicts the behaviour of nominal quantifiers which alternate between N-Agree, Q-Agree, and default. In order to capture the alternation of uninflecting quantifiers between N-Agree and default, the ϕ-features of Q have to be specified for N.SG, following one of the options Danon (2013: 29) suggests for Serbo-Croatian. Adjectival quantifiers do not embed nouns with genitive case, thus they lack the case assigning head. Below, we make two suggestions for the internal structure of adjectival quantifiers, both of which predict only N-Agree as an option, as well as concord with NP.[25]

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[24]The reason for Marušič et al. (2015) to analyse M.PL as default and not resolved agreement in SLovenian comes from observations considering matching gender coordination where M.PL seems to be an option, even if neither of the conjuncts encodes MASC. Willer-Gold et al. (2016: 204) make the same observation for Serbo-Croatian. Murphy and Puškar (2018) account for this observation by proposing two kinds of &, one that is pre-specified for MASC and one that is not, i.e. $\&_{\gamma:M,\square,\square}$ vs. $\&_{\gamma:\square,\square}$. The former is used for M.PL agreement strategy only. It seems then for QNP agreement alternations that there is only $K_{\gamma:\square,\square}$.

[25]The topicalisation data point to (79) rather than to (78), given that complements are easier to extract.

(78)
$$NP_{[\phi:\alpha]}$$

QP NP
$[\phi : \square]$ $[\phi : \alpha]$

(79)
$$QP_{[\phi:\alpha]}$$

Q NP
$[\phi : \square]$ $[\phi : \alpha]$
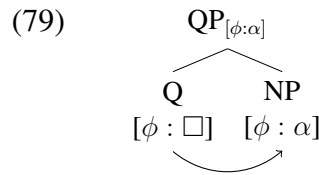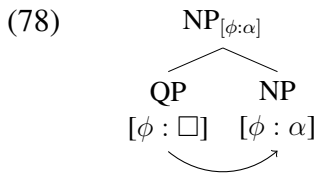
The picture becomes slightly more complex with paucal quantifiers, as 'two' and 'both' do not enter the derivation with their ϕ-features completely valued and can, at least in one order (#2), only agree with the participle via the K head. They receive their gender value via concord with the embedded noun, while the number feature is intrinsically valued as PA. As soon as MERGE applies, both QP and NP are in a configuration where they can perform concord, following Pesetsky's (1989) *Earliness principle*. For the orders #3 and #4, the participle directly agrees with QP, see (63) and (69), respectively. KP-internal concord, therefore, applies after QP and NP have merged in &P. For the order #2, an interesting constellation occurs, which is given in (80). Concord in gender between QP and NP on the one hand and ↑Agree↑ between K and QP on the other hand have to happen simultaneously after MERGE has applied.

(80)   ↑Agree↑ & Concord:

PartP

Part vP
$[\phi : \alpha]$

KP$_{\phi:\alpha,\square}$ v'

...

QP K′
$[\phi : \alpha]$

K NP
$[\phi : \alpha, \square]$ $[\phi : \alpha]$

Since N.SG is analysed as Q-Agree for uninflecting quantifiers, a new correlation between genitive case assignment and Q-Agree/default emerges: Q-Agree/default becomes an option when genitive case is assigned. Post-verbally, N-Agree is unavailable. The data set is summarised in Table 6.

Type of quantifier	concord	GENITIVE	N-Agree pre-V	N-Agree post-V	Q-Agree pre/post-V	default pre/post-V
adjectival	✔	✘	✔	✔	✘	✘
'two', 'both'	✔	✔	✔$_{pl}$	✘	✔$_{pa}$	✔$_{n.sg}$
'three', 'four'	✘	✔	✔$_{pl}$	✘	✔$_{pa}$	✔$_{n.sg}$
nominal	✘	✔	✔$_{pl}$	✘	✔$_{sg}$	✔$_{n.sg}$
uninflecting	✘	✔	✔$_{pl}$	✘	✔$_{sg}$	✔$_{n.sg}$

Table 6: Agreement, concord and genitive with quantifiers (revised)

6   Adnominal genitives and their kin

Genitive is the most widespread oblique case in Serbo-Croatian. Apart from genitives triggered by a wide array of prepositions, complements of nouns in Serbo-Croatian usually bear genitive case, assigned by the head noun (Mrazović and Vukadinović 2009; Zlatić 1997), as illustrated in (81). They typically occur as expressions of possession, see (81a), while also being used as objects of process nominals (81b) and pseudo-partitives (81c).

(81)   *Adnominal genitives in Serbo-Croatian*

    a.   knjig-a   m-og   prijatelj-a
        book-F.SG.NOM my-M.SG.GEN friend-M.SG.GEN
        'my friend's book'

    b.   istrag-a   ubistv-a
        investigation-F.SG.NOM murder-N.SG.GEN
        'a murder investigation'

    c.   tanjir-∅   špaget-a:
        plate-M.SG.NOM spaghetti-F.PL.GEN
        'a plate of spaghetti'

Genitive case on the second noun may lead one to expect that adnominal genitives behave similarly to QNPs. In this section we point out differences between QNPs and other genitive constructions in terms of agreement options, possibility of quantification, and sub-extraction in subject position (similar to the topic splits we saw with QNPs).

In the previous sections we have shown that agreement with QNPs can alternate between Q-Agree, N-Agree and default N.SG in pre-verbal position. In post-verbal position, however, N-Agree is unacceptable. These alternations are not available with prototypical adnominal genitives and pseudo-partitives, that is to say agreement is available only with the nominative noun, irrespective of whether the NP complex occurs pre- or post-verbally.

(82)   *Pre-verbal agreement with adnominal genitives*

    a.   Istrag-a   ubistv-a   je   počel-a   / *počel-o
        investigation-F.SG.NOM murder-N.SG.GEN AUX.3SG began-**F.SG** / began-**N.SG**
        danas.
        today
        'The murder investigation began today.'   (N1-Agree: 4,6 / N2-Agree: 1,4)

    b.   Tanjir-∅   špaget-a: je   prijao-∅   / *su
        plate-M.SG.NOM spaghetti-F.PL.GEN AUX.3SG pleased-**M.SG** / AUX.3PL
        prijal-e   / *je   prijal-o   dečaku.
        pleased-**F.PL** / AUX.3SG pleased-**N.SG** boy
        'A plate of spaghetti agreed with the boy.'
        (N1-Agree: 4,33 / N2-Agree: 1,45 / default: 1,32)

(83)   *Post-verbal agreement with adnominal genitives*

    a.   Danas je   počel-a   / *počel-o   istrag-a
        today AUX.3SG began-**F.SG** / began-**N.SG** investigation-F.SG.NOM
        ubistv-a.
        murder-N.SG.GEN
        'The murder investigation began today.'   (N1-Agree: 4,7 / N2-Agree: 1,37)

b. Dečaku je   prijao-∅   / *su   prijal-e   / *je   prijal-o
   boy   AUX.3SG pleased-**M.SG** / AUX.3PL pleased-**F.PL** / AUX.3SG pleased-**N.SG**
   tanjir-∅   špaget-a:.
   plate-M.SG.NOM spaghetti-F.PL.GEN
   'A plate of spaghetti agreed with the boy.'

(N1-Agree: 4,51 / N2-Agree: 1,5 / default: 1,23)

Apart from showing a different agreement pattern, adnominal genitives can additionally be quantified,[26] as shown in (84a) and (84b) – a property that QNPs do not share, see (84c).

(84) a. dv-a   tanjir-a   špaget-a:
      two-M.PA plate-M.PA spaghetti-F.PL.GEN
      'two plates of spaghetti'
   b. dv-e   istrag-e   ubistv-a
      two-F.PA/PL investigation-F.PA/PL murder-N.SG
      'two murder investigations'
   c. *dv-e   većin-e   klijenat-a:
      two-F.PA/PL majority-f.pa/pl client-M.PL.GEN
      'two majorities of clients'

The third difference between QNPs and adnominal genitives comes from split structures. Zlatić (1997: 209) observes that the adnominal genitive must be adjacent to its head noun, see (85).

(85) a. donacija novca   bolnicama
      donation money.GEN hospitals.DAT
      'donation of money to hospitals'
   b. *donacija bolnicama   novca
      donation hospitals.DAT money.GEN
      'donation of money to hospitals'

This restriction translates to extraction of genitive complements from complex NPs in object positions, which was previously noticed by Zlatić (1997), and subsequently discussed by Bošković (2012, 2013) and Šarić (2017), inter alia. Extraction of genitive nouns from subject NPs is equally unacceptable, shown for process nouns in (86) and pseudo-partitives in (87). In contrast, QNPs are perfectly capable of being split-up across a clause, recall the topicalisation examples in (10) and (44).

---

[26]Quantification of adnominal genitives renders the observed QNP agreement patterns available again. Note that agreement with the second genitive noun (N2-Agree) is unavailable both pre-and post-verbally, indicating that K cannot agree with the more deeply embedded NP.

(i) a. Dv-a   tanjir-a   špaget-a: su   prijal-a   / prijal-i   / *prijal-e   /
      two-M.PA plate-M.PA spaghetti-F.PL.GEN AUX.3PL pleased-**M.PA** / pleased-**M.PL** / pleased-**F.PL** /
      je   prijal-o   dečaku.
      AUX.3SG pleased-**N.SG** boy
      'Two plates of spaghetti agreed with the boy.'
   b. Dečaku su   prijal-a   / *prijal-i   / *prijal-e   / je   prijal-o   dva
      boy   AUX.3PL pleased-**M.PA** / pleased-**M.PL** / pleased-**F.PL** / AUX.3SG pleased-**N.SG** two-M.PA
      tanjir-a   špaget-a:.
      plate-M.PA spaghetti-F.PL.GEN
      'Two plates of spaghetti agreed with the boy.'

(86) a. *Ubistv-a   je   istrag-a   počel-a   danas.
          murder-N.SG AUX.3SG investigation-F.SG began-**F.SG** today
          'As for the murder, its investigation began today.'

      b. *Ubistv-a   je   danas počel-a   istrag-a.
          murder-N.SG AUX.3SG today began-**F.SG** investigation-F.SG
          'As for the murder, its investigation began today.'

(87) a. *Špaget-a: je   tanjir-∅   prijao-∅   dečaku.
          spaghetti-F.PL.GEN AUX.3SG plate-M.SG.NOM pleased-**M.SG** boy
          'As for spaghetti, a plate of them agreed with the boy.'

      b. *Špaget-a: je   dečaku prijao-∅   tanjir-∅.
          spaghetti-F.PL.GEN AUX.3SG boy   pleased-**M.SG** plate-M.SG.NOM
          'As for spaghetti, a plate of them agreed with the boy.'

To sum up, adnominal genitives do not trigger agreement alternations, can be quantified over, and seem to underlie an adjacency requirement. The observed differences between QNPs and adnominal genitives are summarised in Table 7.

	QNP	adnominal GEN	pseudo-partitive
pre-V Agree	Q, N, def	N1, *N2	N1, *N2, *def
post-V Agree	Q, *N, def	N1, *N2	N1, *N2, *def
quantification	✘	✔	✔
splits	✔	✘	✘

Table 7: Differences between QNPs and adnominal genitives

Based on these observations, different structures have been proposed, cf. Bošković (2012, 2013); Zlatić (1997) for extractions from object positions, Caruso (2012) and Šarić (2017) for double genitives structures, Selkirk (1977) for differences in structure and syntactic behaviour of partitives, pseudo-partitives and QNPs in English. For adnominal genitives, the traditionally assumed structure is NP-over-NP, given in (88).[27] Since the embedded NP is never a goal for agreement, we adopt the structure proposed by Zlatić (1997), in which there is no agreeing KP, as it is the case with QNPs.

(88)   [$_{NP}$ N$_{nom}$ [$_{NP}$ N$_{gen}$]]   (Zlatić 1997: 66)

We do not intend to provide a full-fledged analysis here. The observations made in this section, however, indicate that QNPs truly differ from other types of genitives, not only in agreement patterns but also in their syntactic behaviour in general. This leads to a conclusion that these constructions with genitive case must differ in their underlying structure as well.

7   Conclusion and outlook

The current study provides an extensive exploration into the plurality of agreement patterns, observable with QNP subjects in Serbo-Croatian. Contrary to previous reports, the data we contribute show that agreement with QNPs, pre-verbally, can vary between Q-Agree, N-Agree, and default (neuter singular)

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[27]See Pesetsky (2013) and Šarić (2017) for arguments for DP-over-DP structure as in (i). The discussion on the existence of DP in Serbo-Croatian extends beyond the scope of this paper.

(i)   [$_{DP}$ D [$_{NP_{nom}}$ [$_{DP}$ D [$_{NP_{gen}}$]]]]   (Šarić 2017)

agreement; but post-verbally only Q-Agree and default are available options. This asymmetry is consistent with what has been recently reported for conjunct agreement for South Slavic languages: first conjunct agreement and resolved agreement are available both pre- and post-verbally; last conjunct agreement is available only in the pre-verbal case.

Existing approaches to QNP agreement encounter difficulties in accounting for the full set of variation presented here. A rule ordering account, along the lines of Assmann et al. (2015); Georgi (2014); Müller (2009); Murphy and Puškar (2018), seems to offer the most promising solution. The variation in agreement is derived by recourse to different orders of syntactic operations. The derivational account we have argued for is superior to previous accounts because it correctly predicts all attested patterns of pre-verbal and post-verbal agreement in Serbo-Croatian, and excludes the possibility of post-verbal N-Agree, judged by the speakers as unacceptable. An additional advantage of this account is demonstrated by the right predictions it makes for more marked word orders such as topicalisation, without any further assumptions.

Agreement with QNPs in Slavic has received much attention in generative syntax, especially for Russian, where an alternation between singular and plural agreement is found. Proposals put forward (Bailyn 2012; Bošković 2003, 2006, 2010; Pereltsvaig 2006; Pesetsky 1982, 2013 inter alia) have tied these facts to case (nominative vs. non-nominative), sentence positions, and the presence vs. absence of a DP-layer, among other things. Krasovitsky et al. (2009b), a QNP corpus study, report on agreement patterns with QNPs in Russian that exhibit the singular-plural alternations pre- as well as post-verbally (37% singular, 63% plural). Thus, the restriction which holds for Serbo-Croatian, N-Agree being unavailable post-verbally, seems not to hold for the Russian corpus data. With respect to the current approach, the Russian QNP facts could be explained by desynchronising the order of operations between heads. This would ultimately allow for more agreement options, that is, post-verbal N-Agree would not be excluded. Different patterns are reported for conjunct agreement (Krasovitsky et al. 2009a). Alternations are only found if the closest conjunct is singular (pre-verbal singular = 6%, plural = 94%; post-verbal singular = 70%, plural = 30%). These results lead one to conclude that plural is the resolved value, available pre- and postverbally, whereas postverbal last conjunct agreement and preverbal first conjunct agreement are excluded.

According to Marušič and Nevins (2010), QNPs in Slovenian do not show alternating agreement options: agreement only varies with the type of quantifier (N-Agree with numerals 1-4; default with numerals > 5 and other uninflecting quantifiers; Q-Agree with nominal numerals like 'milion'). Conjunctions in Slovenian, however, do trigger agreement alternations (Marušič et al. 2015). Since we associate the parallel between coordinations and QNP agreement patterns with a parallel in structure, see (38) and (39), Slovenian might diverge from this picture in this respect.

Polish Conjunct agreement is the mirror image of Serbo-Croatian. While Polish manifests resolved agreement both pre- and post-verbally, only the last conjunct agrees in pre-verbal subjects. Agreement with either conjunct is always acceptable when the subject is post-verbal, but the availability of pre-verbal last conjunct agreement is dependent on the type of noun, i.e. it is only available with abstract nouns (Citko 2004; Willim 2012). ϕ-agreement with QNP subjects, however, does not alternate: numerals 1–4 combine with nouns in the nominative, allowing predicates to agree only with N. With nominal quantifiers, Q-Agree is the only option, except for cases where the quantifier (nominal or paucal) bears accusative case, then only default N.SG is available. The same restriction holds for higher numerals, which, as argued by Miechowicz-Mathiasen (2014); Przepiórkowski and Patejuk (2012); Witkoś and Dziubała-Szrejbrowska (2016), are accusative by default, and for which, thus, default is the only option. Polish does, however, show agreement alternations in case. Participial and adjectival predicates can agree either with the numeral or the noun, where the predicative may bear accusative or genitive, respectively. Ergo, for Polish case assignment seems to play a crucial and needs to be closer looked into. The present account, so far, does not consider case assignment as an operation that is

ordered with respect to other operations.

Judging from the data given by Danon (2013), we can conclude that QNP agreement in Modern Hebrew can optionally alternate between Q-Agree and N-Agree in the pre-verbal position, but it is unclear what restricts the availability of these options in examples like (3). To the best of our knowledge, it is not reported whether the same holds for post-verbal cases. Doron (2000), however, reports that agreement with conjoined noun phrases alternates only post-verbally, and pre-verbal subjects trigger resolved agreement. A more thorough look into Hebrew is required in order to give a solution to the puzzle.

Hungarian and Finnish are some of the languages reported by Kiss (2012) and Crone (2016) to have a pre-verbal/post-verbal agreement asymmetry with conjoined noun phrases. In Hungarian, pre-verbal agreement can alternate between singular and plural, but post-verbally only singular is available. In Finnish, agreement alternations with conjoined noun phrases are available post-verbally (singular or plural), but pre-verbally only plural agreement is available. Swahili exhibits the same pattern, as Marten (2005) reports. Conjoined noun phrases in Modern Greek trigger a large variety of agreement alternations, sensitive to the hierarchy of genders, with a preference for first conjunct agreement in post-verbal cases (Kazana 2011). In contrast to these languages, in Albanian the adjectival participle must agree with the closest conjunct, which is the final one (Peterson 1986). Depending on whether QNPs in these languages can trigger agreement alternations,[28] potential further evidence can be found for the current theory.

Needless to say, more extensive empirical studies are required in order to give a full account of the cross-linguistic variation, a goal that lies beyond the scope of this paper. The empirical generalisations on the parallels of QNP agreement and conjunct agreement, identified in this paper for Serbo-Croatian, thus remain to be further examined.

Abbreviations

QNP = quantified noun phrase, Q-Agree = agreement with the quantifier, N-Agree = agreement with the noun, GEN = genitive, NOM = nominative, DAT = dative, PL = plural, SG = singular, PA = paucal, M = masculine, F = feminine, N = neuter, AUX = auxiliary verb, REFL = reflexive, POSS = possessive

Acknowledgements

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[28]Kiss (2012) gives only one example in which a pre-verbal QNP 'two detectives' triggers singular on the verb. Dal Pozzo (2007: 124) glosses singular agreement on the verb only in one example, with the QNP 'many friends' in the pre-verbal position.

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