

How Across-the-Board movement interacts with nominal concord in Bulgarian

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1 Introduction

Bulgarian nominal phrases allow singular coordinated adjectives to modify a plural noun (see e.g. Mayer 1987 and Harizanov & Gribanova (to appear)):¹

- (1) a. *bălgarsk-i-ja i rusk-i narod-i*
bulgarian-SG.M-the and russian-SG.M nation-PL
'the Bulgarian and Russian nations'
(two nations: a Bulgarian and a Russian one)
- b. *bălgarsk-o-to i grăck-o pravitelstv-a*
bulgarian-SG.N-the and greek-SG.N government-PL
'the Bulgarian and Greek governments'
(two governments: a Bulgarian and a Greek one)
- c. *părv-a-ta i posledn-a stranic-i*
first-SG.F-the and last-SG.F page-PL
'the first and last pages'
(two pages: a first and a last one)

Arregi & Nevins (2013) (henceforth A&N) argue that the structure of examples like (1) maximally and quite transparently reflects their surface appearance, with two singular coordinated adjectives adjoined to a plural noun. We claim that A&N's account complicates the mechanics of nominal concord in Bulgarian, with the undesirable consequence that nominal concord must feed semantic interpretation. We develop an alternative proposal by addressing the following questions:

1. What is the underlying structure of such examples, and how does it correspond to their particular readings?
2. What is the mechanism by which the number feature on each of the two adjectives may be mismatched with the number feature on the noun they putatively modify in this nominal concord language?

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¹Abbreviations: F—feminine, M—masculine, N—neuter, PL—plural, REFL—reflexive, SG—singular. Transliteration standard used in the Bulgarian examples: ISO 9 (1968).

The debate about the morphosyntax of this construction is particularly important because it bears ultimately on the proper analysis of the form of the definiteness marker in the first conjunct of the examples in (1). In Harizanov & Gribanova (2011) and Harizanov & Gribanova (to appear) we leverage the facts in (1) to support the claim that the definiteness marker’s form exhibits a type of allomorphy, more local than nominal concord: the form of the definiteness marker in (1) is determined by the features of the adjective it attaches to, rather than those of the head noun. A&N disagree, providing a concord-based analysis of the same facts. In sum, what is behind the definiteness marker’s form—allomorphy or concord—will ultimately depend on the morphosyntactic account of this construction. In our alternative analysis there are two identical nouns, each modified by a singular adjective, which escape the coordinate structure via across-the-board movement. Our account makes sense of the number mismatch, as well as novel facts involving *plurality tantum* and suppletive plural nouns, which A&N’s account fails to capture. In addition, it accurately reflects the interpretations involved in (1) (and (3) below), and it supports the idea that concord is a purely morphosyntactic process, related to interpretation as an indirect consequence of the syntactic structures it references.

In this paper, we first present the empirical details of the construction in §2. Then, we discuss A&N’s analysis and introduce the empirical issues it faces. In §5, we present our alternative analysis and how it covers the previously challenging empirical ground.

2 The phenomenon

In English, what appear to be coordinated adjectives can modify a singular or a plural noun, as in (2) and (3). If the modified noun is plural, a systematic ambiguity arises, as demonstrated by (3a) and (3b).

- (2) *the first and last page, the blue and red car*
(a page that is both first and last, a car with two colors)
- (3) *the first and last pages, the blue and red cars*
 - a. “total of two pages/cars”
 - b. “more than two pages/cars”

In Bulgarian, we are interested in the interpretation corresponding to (3a), which characterizes the examples in (1). The other two interpretations, (2) and (3b), are also available in Bulgarian, but they do not display the peculiar singular-plural mismatch that is characteristic of (1).

- (4) Singular coordinated adjectives modifying a singular noun
 - a. *bălgarsk-i-ja i rusk-i narod-∅*
bulgarian-SG.M-the and russian-SG.M nation-SG.M
‘the Bulgarian and Russian nation’ (one nation) (like (2))
 - b. *bălgarsk-o-to i grăck-o pravitelstv-o*
bulgarian-SG.N-the and greek-SG.N government-SG.N
‘the Bulgarian and Greek government’ (one government) (like (2))

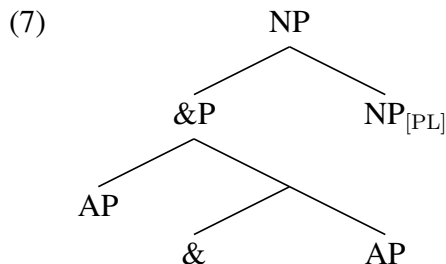
- (5) Plural coordinated adjectives modifying a plural noun
- a. bǎlgarsk-**i**-te i rusk-**i** narod-**i**
 bulgarian-PL-the and russian-PL nation-PL
 ‘the Bulgarian and Russian nations’ (like (3b))
 (more than one Bulgarian and more than one Russian nation)
- b. bǎlgarsk-**i**-te i grǎck-**i** pravitelstv-**a**
 bulgarian-PL-the and greek-PL government-PL
 ‘the Bulgarian and Greek governments’ (like (3b))
 (more than one Bulgarian and more than one Greek governments)

In addition, it is important to note that the complex constituent containing the coordinated singular adjectives modifying a plural noun in (1) is semantically plural, and triggers plural subject-verb agreement:

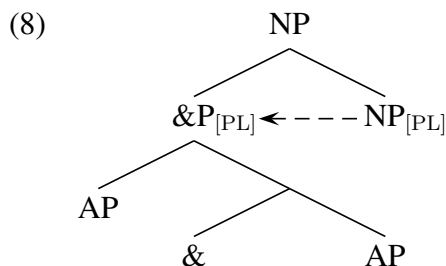
- (6) a. bǎlgarsk-**i**-ja i rusk-**i** narod-**i** si
 bulgarian-SG.M-the and russian-SG.M nation-PL REFL
 sǎtrudničiha / *sǎtrudniči
 collaborated.PL / *collaborated.SG
 ‘the Bulgarian and Russian nations collaborated’
 (two nations: a Bulgarian and a Russian one)
- b. bǎlgarsk-**o**-to i grǎck-**o** pravitelstv-**a** podpisaha /
 bulgarian-SG.N-the and greek-SG.N government-PL signed.PL /
 *podpisa sporazumenieto
 *signed.SG the.agreement
 ‘the Bulgarian and Greek governments signed the agreement’
 (two governments: a Bulgarian and a Greek one)

3 Previous work

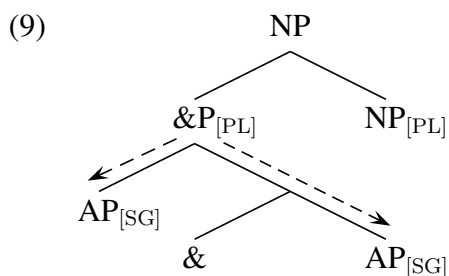
Arregi & Nevins (2013) argue that the syntactic structure of such examples maximally reflects their surface appearance in the sense that there is no covert structure or transformations that produce the surface strings out of more abstract syntactic structures. In particular, they make the following assumptions. First, in such examples they assume that a single plural NP is modified by conjoined APs, and that the coordinate structure as a whole occupies the same position as AP modifiers more generally—adjuncts in the extended nominal projection (see e.g. Dost & Gribanova 2006; cf. Embick & Noyer 2001):



Second, A&N assume that &P probes in its c-command domain and finds the plural NP. Consequently, the &P probe and the NP goal enter an agreement relation of the kind responsible for nominal concord on DP-internal modifiers:²



Finally, the features of each conjoined adjective are determined by an elaboration of agreement resolution with coordination (Corbett 1983). Resolution rules are usually assumed to specify the features of a coordinate structure based on the features of its conjuncts, as diagnosed by some agreement process. A&N assume, instead, that resolution rules are non-directional and can also specify the form (or features) of the conjuncts that comprise the coordinate structure based on the features of the coordinate structure as a whole. Then, in the Bulgarian examples under discussion agreement resolution may result in each adjective bearing singular features if the whole coordinate phrase is plural:



However, since the coordinate structure (the &P node specifically) acquires its features via nominal concord, this analysis has the undesirable consequence that concord must feed semantic interpretation. This is because singular agreement on both adjectives yields a distinct interpretation from plural agreement (Arregi & Nevins (2013), p. 220, note 20).

4 Empirical issues

A&N's account faces a number of empirical issues. First, A&N's agreement resolution mechanism permits either of the adjectives to be plural while the other one is singular. However, only both-singular (10a) or both-plural (10b) patterns are permissible:

²This claim only holds under an Agree-based implementation of concord, which requires phrasal (i.e. maximal/XP) nodes to be able to serve as probes (see Carstens 2012 on phrasal probes).

- (10) a. p̃rv-a i posledn-a stranic-i
 first-SG.F and last-SG.F page-PL
 ‘first and last pages’
 (one first and one last page) = (1c)
- b. p̃rv-i i posledn-i stranic-i
 first-PL and last-PL page-PL
 ‘first and last pages’
 (more than one first and more than one last page)
- c. * p̃rv-i i posledn-a stranic-i
 first-PL and last-SG.F page-PL
- d. * p̃rv-a i posledn-i stranic-i
 first-SG.F and last-PL page-PL

Second, in A&N’s account, there is no reason why singular adjectives modifying a *pluralia tantum* noun should be ungrammatical: nothing blocks the resolution of a plural feature to two singular conjuncts. However, only plural adjectives are permitted with *pluralia tantum* nouns:

- (11) a. mr̃sn-i i čist-i očila
 dirty-PL and clean-PL glasses
- b. * mr̃sn-a i čist-a očila
 dirty-SG.F and clean-SG.F glasses
- c. * mr̃sn-o i čist-o očila
 dirty-SG.N and clean-SG.N glasses
- d. * mr̃sen i čist-∅ očila
 dirty.SG.M and clean-SG.M glasses

Third, in A&N’s account, there is no way to explain the inability of singular coordinated adjectives to modify plural nouns when the plural forms of those nouns are suppletive:

- (12) Suppletive plural:
 čovek ‘person’—hora ‘people’
- (13) a. * nisk-ij-a i visok hora
 short-SG.M-the and tall.SG.M people
 ‘the short and tall people’
- b. * bulgarsk-ij-a i rusk-i hora
 bulgarian-SG.M-the and russian-SG.M people
 ‘the Bulgarian and Russian people’

In addition, there exist nouns that undergo stem changes in the plural:

- (14) Plural stem changes
 dete ‘child’—deca ‘children’, oko ‘eye’—oči ‘eyes’, uho ‘ear’—ušī ‘ears’

These plurals, like suppletive plurals, do not appear with singular coordinated adjectives either:

- (15) a. * naj-nisk-o-to i naj-visok-o deca
 most-short-SG.N-the and most-tall-SG.N children
 ‘the shortest and tallest children’
 b. * ljav-o-to mi i djasn-o oči
 left-SG.N-the my and right-SG.N eyes
 ‘my left and right eyes’

Only all-plural adjectives with the irregular plural nouns (16) or all-singular adjectives with the singular nouns (17) are permitted:

- (16) a. naj-nisk-i-te i naj-visok-i deca
 most-short-PL-the and most-tall-PL children
 ‘the shortest and tallest children’
 b. lev-i-te i desn-i oči
 left-PL-the and right-PL eyes
 ‘the left and right eyes’
- (17) a. naj-nisk-o-to i naj-visok-o dete
 most-short-SG.N-the and most-tall-SG.N child
 ‘the shortest and tallest child’ (possible: two children)
 b. ljav-o-to mi i djasn-o oko
 left-SG.N-the my and right-SG.N eye
 ‘my left and right eyes’ (possible: two eyes)

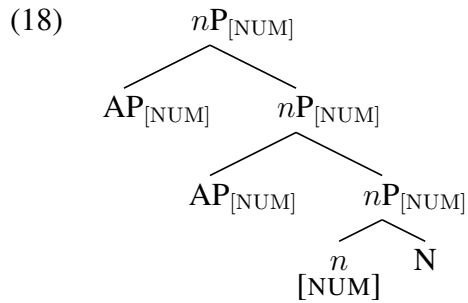
In sum, A&N’s account faces empirical issues with respect to (i) number mismatches among conjuncts, (ii) pluralia tantum nouns, and (iii) irregular plurals, which involve full or partial suppletion.

5 An alternative analysis

Our alternative account provides a principled explanation of all three observations described in Section 4, without requiring concord to feed semantic interpretation. It addresses the following three questions: (i) what is the underlying structure of the examples under discussion? (ii) why does only one noun surface? and (iii) why does this noun bear plural morphology?

5.1 What is the underlying structure?

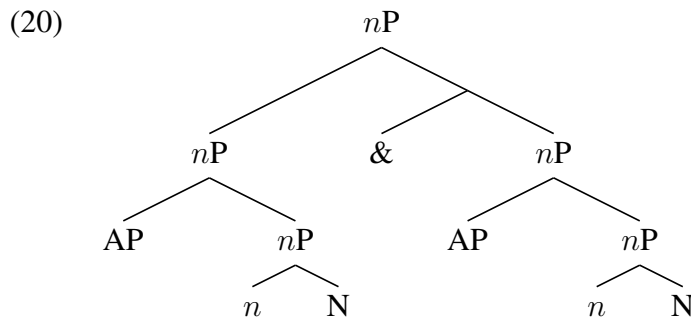
As far as nominal phrases in general are concerned, we assume that roots merge with a categorizing *n* head, which bears number features. We take number to be represented in terms of a privative feature so that the value [PL] gets expressed by plural morphology while absence of number features conditions the realization of non-plural morphology (Nevins 2011). Furthermore, we assume that APs are adjuncts to *n*P and receive number features via concord:



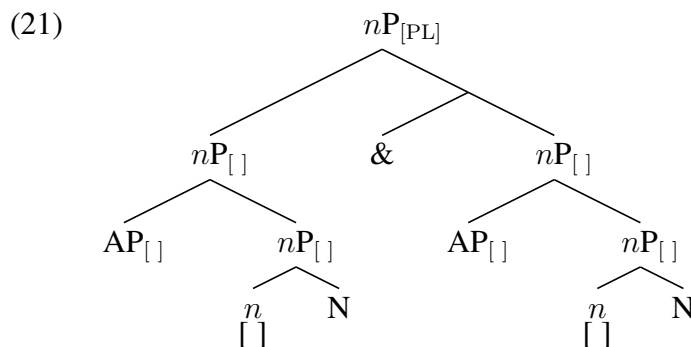
The tree above represents hierarchical structure only and does not encode linear order. In Bulgarian, adjectives are canonically linearized to the left of the nouns they modify and *n* is a suffix:



As far as the coordinate structures of interest are concerned, we assume that there are two coordinated *nPs*, which reflect the semantically plural interpretation, and each of them contains an AP (cf. A&N's approach):



So, these *nPs* are identical and non-plural—i.e. there is no number feature on *n*. Note that each AP matches the features of the *nP* it modifies (i.e. non-plural) in a canonical instance of concord within each *nP* conjunct:³



5.2 Why is there only one noun on the surface?

Given these assumptions about the relevant underlying structures, the following question arises: what is the mechanism by which only one noun is pronounced?

³The coordinate structure (*nP*) as a whole is plural by a general mechanism that does not concern us here.

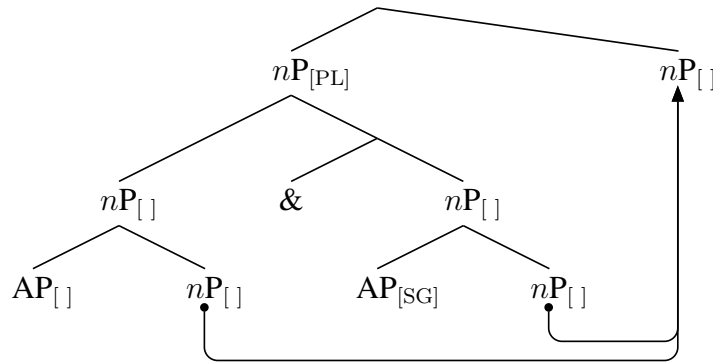
One possibility is that the noun in the left conjunct is elided. However, an ellipsis account of the target construction is empirically inadequate, as it cannot generate a structure associated with the target interpretation and morphological marking: (22a) does not generate the target morphological marking; (22b) does not generate the target interpretation or morphological marking; (22c) can be derived (though not with the target interpretation or morphological marking) but is ungrammatical; (22d) can be derived (also not with the target interpretation or morphological marking) but is ungrammatical as well.

- (22) a. *bălgarsk-o* ~~*pravitelstv-o*~~ *i* *grăck-o*
 bulgarian-SG.N government-SG.N and greek-SG.N
pravitelstv-o
 government-SG.N
 ‘a Bulgarian government and a Greek government’
- b. *bălgarsk-i* ~~*pravitelstv-a*~~ *i* *grăck-i* *pravitelstv-a*
 bulgarian-PL government-PL and greek-PL government-PL
 ‘Bulgarian governments and Greek governments’
- c. **bălgarsk-o* ~~*pravitelstv-o*~~ *i* *grăck-i* *pravitelstv-a*
 bulgarian-SG.N government-SG.N and greek-PL government-PL
 ‘a Bulgarian government and Greek governments’
- d. **bălgarsk-i* ~~*pravitelstv-a*~~ *i* *grăck-o* *pravitelstv-o*
 bulgarian-PL government-PL and greek-SG.N government-SG.N
 ‘Bulgarian governments and a Greek government’

Additional mysteries surround the ellipsis approach: e.g. why is the ellipsis obligatory? and why is the ellipsis only backwards?

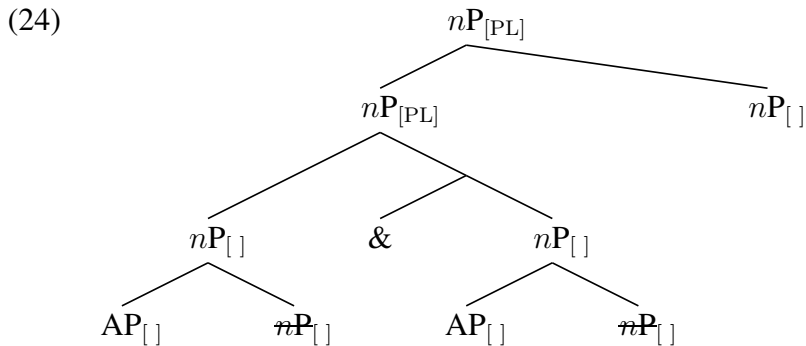
Thus, instead of pursuing an ellipsis approach, we propose that the pronunciation of a single noun on the surface is due to across-the-board movement.⁴ In particular, the identical *nPs* from each conjunct undergo across-the-board (ATB) movement and adjoin to the coordinate *nP* (cf. Ross 1967, Sabbagh 2007 on right node raising).

(23)



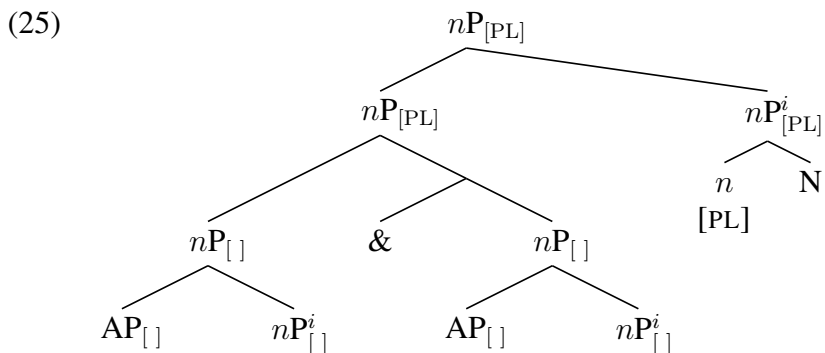
⁴We do not make an effort here to distinguish between an across-the-board movement account and a multidominance approach, though see §6.4 for some tentative evidence in favor of the former.

The moved *nP* is pronounced only once, in its highest position and in accordance with the linearization rules of Bulgarian:



5.3 Why is the lone noun realized as plural?

The remaining question concerns the morphologically plural form of the single noun, even though the nouns in the proposed coordinate structure above are non-plural. The coordinate *nP* contributes plural features to its container nominal phrase the way that, for example, a numeral would. These plural features get distributed to other elements within the nominal phrase via concord. By virtue of merging with the plural coordinated constituent (*nP*[PL]), the head *n* of the ATB-moved *nP*^{*i*} is supplied with plural features via concord:⁵



This proposal explains the target construction as resulting from the interaction between two independently motivated pieces of morphosyntax: ATB movement and concord within nominal phrases. It leverages the idea that syntactic structure feeds both concord (on the sound side) and semantic interpretation (on the meaning side), but there is no direct link between concord and meaning.

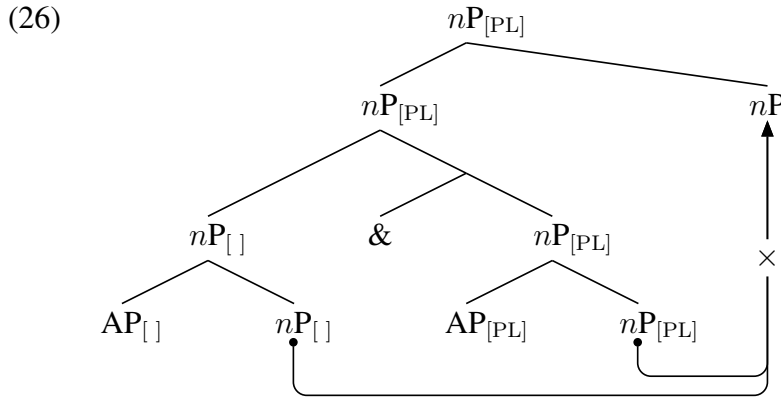
6 Evidence

This approach helps us understand the intriguing properties of the target construction discussed in §4.

⁵The *nP* conjuncts are opaque at this point; they define their separate domains for concord and, accordingly, remain non-plural.

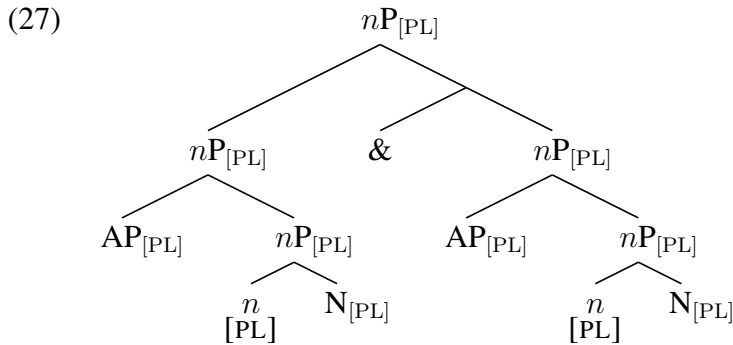
6.1 Conjunct mismatch in number

First, the fact that number mismatch among the two adjectives is ungrammatical (10) receives a natural explanation, as only identical *n*Ps undergo ATB movement—there is no way for only one of them to be singular and the other plural:



6.2 Pluralia tantum

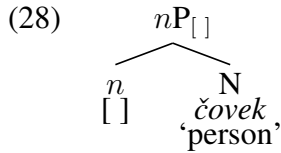
The account also explains the facts about *pluralia tantum* nouns in (11). We take such nouns to exceptionally bear their own plural features, for example, on N (Kramer 2009).⁶ This forces plural adjectives, since each adjective will agree with an inherently plural noun in such instances, and the target construction—with singular adjectives—cannot be derived:



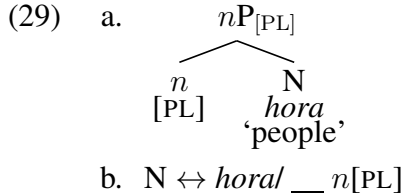
6.3 Irregular plurals

Recall that irregular plurals, involving full or partial suppletion, cannot be modified by singular coordinated adjectives. On the account adopted here, this falls out from the following assumptions. First, roots undergo lexical insertion early and only once (Embick 2000; Embick & Halle 2005; Embick & Noyer 2007). For example, a suppletive plural like *čovek* ‘person’ would be inserted early, as in the tree below, where by “early” we mean before any post-syntactic processes and, at least, before some syntactic movement—including ATB movement.

⁶There may need to be agreement between this inherent plural feature on N and the number feature on *n*.

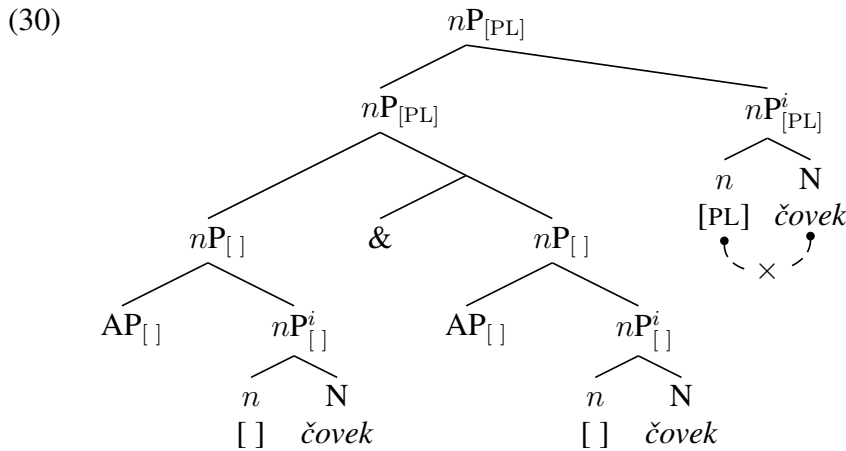


Second, we assume that suppletion is contextual allomorphy (Embick 2000). The suppletive variant of this noun in the plural, *hora* ‘people’, would be inserted instead in the context of a plural feature on n :



Third, we assume that the locus of contextual allomorphy is lexical insertion (Embick 2000). In other words, the choice between *čovek* ‘person’ and *hora* ‘people’ is made at the point when lexical insertion of roots applies—i.e. “early” in the relevant sense.

Now suppose the target construction is to be derived with the noun *čovek* ‘person’. First, the root will be inserted early; then, ATB movement of the identical nP^i s will apply; finally, the mechanism of concord will endow the little n that heads the ATB-moved nP^i with plural features:



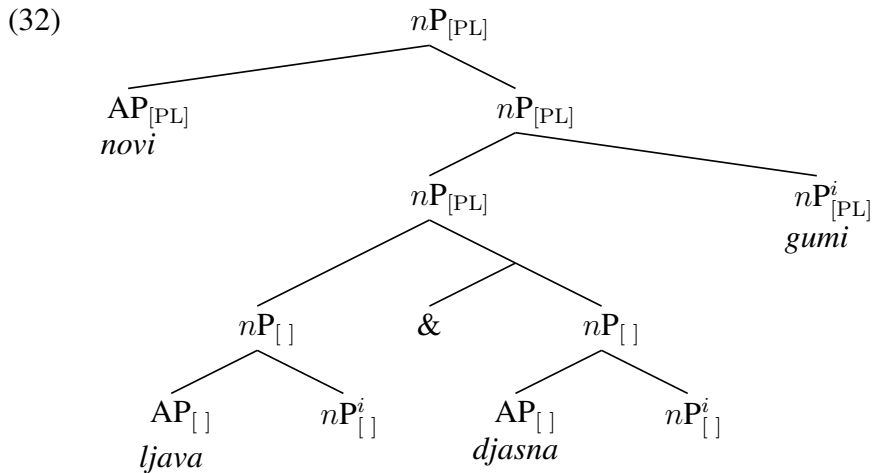
However, since the N root inside the ATB-moved nP^i will have already undergone lexical insertion, $n_{[PL]}$ cannot condition contextual allomorphy. Therefore, the target construction cannot be generated with a suppletive plural.

6.4 Additional empirical observations

Further evidence for our proposal comes from the following three sets of facts. First, adjectives that precede the coordinated singular adjectives are plural:

- (31) nov-i-te ljav-a i djasn-a gum-i
 new-PL-the left-SG.F and right-SG.F tire-PL
 ‘the new left and right tires’ (two tires)

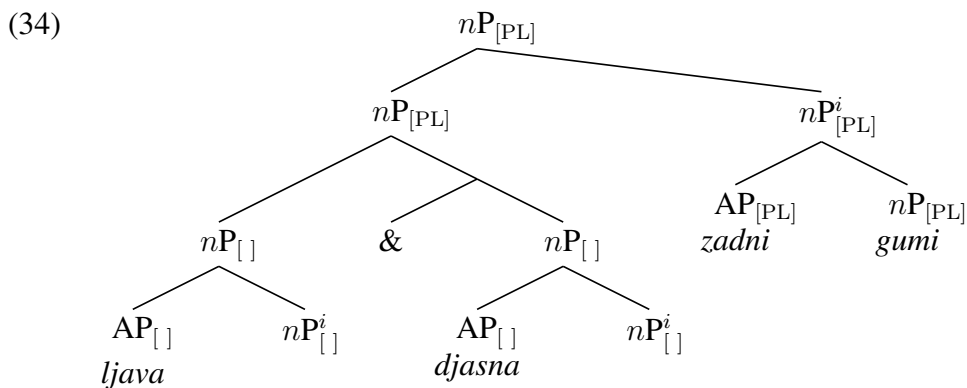
In such examples, the coordinate structure *nP* contributes plural features to the whole nominal phrase, and they get distributed to other modifying adjectives via concord. It is then expected that any adjectives that are outside of the coordinate structure but within the nominal phrase containing it will be morphologically plural:



Second, adjectives that on the surface occur between the coordinated singular adjectives and the plural noun are plural:

- (33) ljav-a-ta i djasn-a zadn-i gum-i
 left-SG.F-the and right-SG.F rear-PL tire-PL
 ‘the left and right rear tires’ (two tires)

The ATB-moved constituent here is *rear tires*, an *nP* that includes an adjoined AP, and plural features get distributed via concord in the usual way:

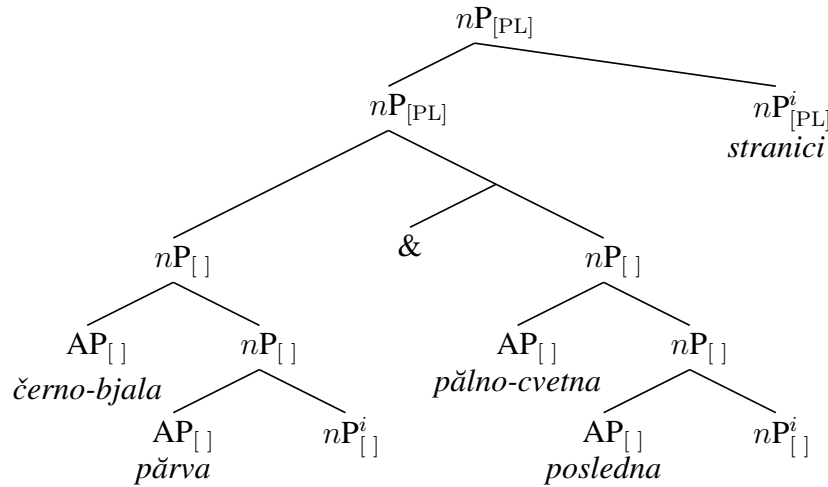


Third, there can be more than one adjective in each conjunct:

- (35) černo-bjal-a-ta p̄rv-a i p̄lno-cvetn-a posledn-a stranic-i
 black-white-SG.F-the first-SG.F and full-color-SG.F last-SG.F page-PL
 ‘the black-and-white first and full-color last pages’ (two pages)

This is expected if the construction involves coordination of nominal constituents (*nP*) and not just APs:

(36)



7 Conclusion

We have claimed that the target construction—two coordinated singular adjectives modifying a plural noun—is derived from an underlying structure in which there are in fact two coordinated noun phrases. This eliminates an undesirable consequence of the A&N account, namely that concord should feed interpretation. Instead, both interpretation and concord are the result of the same underlying structure, and are only indirectly related to each other. The mismatch in number is derived via a combination of ATB movement of the conjoined noun phrases and the process of nominal concord. This allows us to account for: (i) the inability of the two adjectives in the target construction to be mismatched in number; (ii) the inability of *pluralia tantum* nouns to participate in the target construction; and (iii) the inability of suppletive or irregular plurals to participate in the target construction.

Various questions arise about the details of how concord and ATB movement interact, which we leave for future investigation. It will ultimately be necessary to embed this analysis in a concrete theory of concord, and/or to compare how differing theories of concord interact with syntactic movement processes like ATB movement. We believe that such questions can be resolved by exploring the crosslinguistic empirical landscape, and in particular, whether the same patterns hold in other languages (e.g. Spanish, Russian) with this construction. Such a broader investigation should give rise to a more articulated understanding of the interaction between the mechanisms of narrow syntax (ATB movement) and morphological operations like concord.

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