1 Introduction

- Bulgarian nominal phrases allow singular coordinated adjectives to modify a plural noun (see e.g. Mayer 1987):

(1) a. български-я и руски народи
bulgarian-sg.m-the and russian-sg.m nation-pl
‘the Bulgarian and Russian nations’
(two nations: a Bulgarian and a Russian one)

b. български-ото и гръцко правителство
bulgarian-sg.n-the and greek-sg.n government-pl
‘the Bulgarian and Greek governments’
(two governments: a Bulgarian and a Greek one)

c. първа и последна страница
first-sg.f-the and last-sg.f page-pl
‘the first and last pages’
(two pages: a first and a last one)

- 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 number features on the two adjectives may be mismatched with the noun they putatively modify in this nominal concord language?

- Arregi and Nevins (To appear) (henceforth A&N): the structure of such examples maximally reflects their surface syntax, with two singular coordinated adjectives adjoined to a plural noun.
Our claims:

- A&N’s account complicates the mechanics of nominal concord in Bulgarian, with the undesirable consequence that nominal concord must feed semantic interpretation.
- An alternative: there are two identical nouns, each modified by a singular adjective, which escape the coordinate structure via across-the-board movement.
- This account makes sense of the number mismatch, as well as novel facts involving pluralia tautum and suppletive plural nouns, which A&N’s account fails to capture.
- 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.

Roadmap:

1. empirical details of the construction
2. previous work
3. empirical issues
4. an alternative
5. covering previously challenging empirical ground
6. future directions

2 The phenomenon

- The meaning: English

(2) the first and last page, the blue and red car
(a book with a single page, 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”

- The meaning: Bulgarian

- We are interested in the interpretation (3a), corresponding to the examples in (1);
- the other two interpretations, (2) and (3b), are also available in Bulgarian:

(4) Singular coordinated adjectives modifying a singular noun

   a. bălgarsk-i-ja i rusk-i narod-ø
      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. bălgarsk-i-te i rusk-i narod-i
      bulgarian-pl-the and russian-pl nation-pl
      ‘the Bulgarian and Russian nations’
      (more than one Bulgarian and more than one Russian nation) (like (3b))
   b. bălgarsk-i-te i grăck-i pravitelstv-a
      bulgarian-pl-the and greek-pl government-pl
      ‘the Bulgarian and Greek governments’
      (more than one Bulgarian and more than one Greek governments) (like (3b))

• The complex containing the coordinated singular adjectives modifying a plural noun is also semantically plural, and triggers plural subject-verb agreement:

(6) a. bălgarsk-i-ja i rusk-i narod si sātrudničiha
    bulgarian-sg.m-the and russian-sg.m nation-pl refl collaborated.pl
    ‘the Bulgarian and Russian nations collaborated’
    (two nations: a Bulgarian and a Russian one)
   b. bălgarsk-o-to i grăck-o pravitelstv-a podpisaha sporazumenieto
    bulgarian-sg.m-the and greek-sg.n government-pl signed.pl the.agreement
    ‘the Bulgarian and Greek governments signed the agreement’
    (two governments: a Bulgarian and a Greek one)

3 Previous work

• Arregi and Nevins (To appear): the structure of such examples maximally reflects their surface syntax.

1. A single plural NP is modified by conjoined APs;
2. The coordinate structure occupies the same position as AP modifiers (see e.g. Dost and Gribanova 2006; cf. Embick and Noyer 2001):

(7) NP
    &P
    NP[pl]
    AP
    &AP

3. &P (the probe) and the plural NP (the goal) enter an agreement relation of the kind responsible for nominal concord on DP-internal modifiers (see Carstens 2012 on phrasal probes):
4. The features of each conjoined adjective are determined by an elaboration of agreement resolution with coordination (Corbett 1983);
5. agreement resolution may result in each adjective bearing singular features if the whole coordinate phrase bears plural features:

\[
\text{(8)} \quad \begin{array}{c}
\text{NP} \\
\& \text{P}_{[PL]} \\
\text{AP} \\
\& \\
\text{AP}
\end{array}
\]

- **Undesirable consequence**: nominal concord must feed semantic interpretation. Singular agreement on both adjectives yields a distinct interpretation from plural agreement (Arregi and Nevins (To appear), p. 22, fn. 20).

4 **Empirical issues**

- **A\&N**’s agreement resolution mechanism permits either of the adjectives to be plural while the other one is singular.
- However, only both-singular (1a) or both-plural (10b) patterns are permissible:

\[
\text{(10) a. părv-a i posledn-a stranic-i} \\
\text{first-SG.F and last-SG.F page-PL} \\
\text{‘first and last pages’} \\
\text{(one first and one last page)}
\]

\[
\text{(10) b. părv-i i posledn-i stranic-i} \\
\text{first-PL and last-PL page-PL} \\
\text{‘first and last pages’} \\
\text{(more than one first and more than one last page)}
\]

\[
\text{(10) c. * părv-i i posledn-a stranic-i} \\
\text{first-PL and last-SG.F page-PL}
\]

\[
\text{(10) d. * părv-a i posledn-i stranic-i} \\
\text{first-SG.F and last-PL page-PL}
\]
• 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. *mrăsn-i i čist-i očila
dirty-PL and clean-PL glasses

b. *mrăsn-a i čist-a očila
dirty-SG.F and clean-SG.F glasses

c. *mrăsn-o i čist-o očila
dirty-SG.N and clean-SG.N glasses

d. *mrăsen i čist-ø očila
dirty-SG.M and clean-SG.M glasses

• 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’

• Like suppletive plurals, plural forms that undergo stem changes do not appear with singular coordinated adjectives either:

(14) Plural stem changes
a. dete ‘child’—deca ‘children’

b. oko ‘eye’—oči ‘eyes’

c. uho ‘ear’—uši ‘ears’

(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 noun (16) or all-singular adjectives with the singular noun (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)

• A summary of empirical issues with A&N’s account:
  1. mismatches among conjuncts;
  2. pluralia tantum nouns;
  3. irregular plurals (full/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.

5.1 What is the underlying structure?

• Assumptions about nominal phrases:
  1. hierarchical structure (order not encoded)

\[
\begin{array}{c}
\text{nP}_{\text{NUM}} \\
\text{AP}_{\text{NUM}} \quad \text{nP}_{\text{NUM}} \\
\text{AP}_{\text{NUM}} \quad \text{nP}_{\text{NUM}} \\
\text{n}_{\text{NUM}} \quad \text{N}
\end{array}
\]
2. APs are adjuncts to \(nP\) and receive number features via concord
3. number (\textit{num}) is a privative feature: the absence [ ] or presence [\textit{pl}] of plural on \(n\)
4. absence of number features conditions the realization of non-plural morphology
5. linearization: As canonically precede Ns and \(n\) is a suffix

\[(19) \quad A_{\text{[num]}} - A_{\text{[num]}} - N - n_{\text{[num]}}\]

- Assumptions about the coordinate structures of interest:
  1. There are two coordinated \(nP\)s—reflecting the semantically plural interpretation—each containing an AP.

\[(20)\]

\[
\begin{array}{c}
  nP \\
  \quad \quad \downarrow \text{&} \quad \downarrow \\
  nP & nP \\
  \quad \quad \downarrow \quad \quad \downarrow \\
  AP & nP & AP & nP \\
  \quad \quad \downarrow \quad \quad \downarrow \\
  n & N & n & N \\
\end{array}
\]

2. These identical \(nP\)s are non-plural (i.e. no \textit{num} feature on \(n\)).
3. Each AP matches the features of the \(nP\) it modifies (i.e. non-plural) in a canonical instance of concord within each \(nP\) conjunct.
4. The coordinate structure (\(nP\)) as a whole is plural by a mechanism that does not concern us here.

\[(21)\]

\[
\begin{array}{c}
  nP_{[\text{pl}]} \\
  \quad \quad \downarrow \text{&} \quad \downarrow \\
  nP_{[\text{]} } & nP_{[\text{]} } \\
  \quad \quad \downarrow \quad \quad \downarrow \\
  AP_{[\text{]} } & nP_{[\text{]} } & AP_{[\text{]} } & nP_{[\text{]} } \\
  \quad \quad \downarrow \quad \quad \downarrow \\
  n & N & n & N \\
\end{array}
\]

- Questions:
  1. What is the mechanism by which only one noun is pronounced?
     - Ellipsis? (see Appendix A)
     - Across-the-board movement / multidominance?\(^1\)
  2. What is the mechanism by which that one noun comes to bear plural features, even though the nouns in the proposed coordinate structure (21) are non-plural?

\(^1\)We do not make an effort here to distinguish between an ATB account and a multidominance approach, though see Appendix B for some tentative evidence in favor of the former.
5.2 Why is there only one noun on the surface?

- **Our proposal**: the identical nP’s from each conjunct undergo across-the-board (ATB) movement and adjoin to the coordinate nP (cf. Ross 1967, Sabbagh 2007 on RNR).

\[(22)\]

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

\[(23)\]

5.3 Why is the lone noun realized as plural?

- The coordinate nP contributes plural features to its container nominal phrase (just like a numeral would), which get distributed to other nominal elements (via concord).
- By virtue of merging with the plural coordinated constituent,
- the head n of the ATB-moved nP is supplied with plural features (via concord).
The \( nP \) conjuncts are opaque at this point; they define their separate domains for concord and, accordingly, remain non-plural.

Our proposal 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

6.1 Conjunct mismatch in number

- Recall: number mismatch among the two adjectives is ungrammatical (10).
- A natural explanation: only identical \( nPs \) undergo ATB movement—either singular or plural, but 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), if we take them to be those nouns which exceptionally bear their own plural features (on N) (Kramer 2009).²

²There may need to be agreement between this inherent plural feature on N and the number feature on \( n \).
• This forces plural adjectives: each adjective will agree with an inherently plural noun in such instances and the target construction (with singular adjectives) cannot be derived.

(26)

6.3 Irregular plurals

• Recall: irregular plurals, involving full/partial suppletion, cannot be modified by singular coordinated adjectives.

• On the account adopted here, this falls out from the following assumptions:

1. roots undergo lexical insertion early and only once (Embick 2000; Embick and Halle 2005; Embick and Noyer 2007);

(27)

2. suppletion is contextual allomorphy (Embick 2000);

(28)  a. 

b. \( N \leftrightarrow \text{hora} / \_n[\text{PL}] \)

3. the locus of contextual allomorphy is lexical insertion (Embick 2000).
• Since the N root inside the ATB-moved nP will have already undergone lexical insertion, 
  \( n[\text{PL}] \) cannot condition contextual allomorphy.
• Therefore, the target construction cannot be generated with a suppletive plural.

\[(29)\]

7 Conclusion

• What we’ve claimed:
  ○ The target construction (two 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&M account: 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 nPs 
    and the process of nominal concord.
  ○ This allows us to account for:
    1. The inability of the two adjectives to be mismatched in number (in the target
       construction);
    2. The inability of pluralia tantum nouns to participate in the target construction;
    3. The inability of suppletive or irregular plurals to participate in the target con-
       struction.
• Future directions:
  ○ Specifying the details: how do concord and ATB movement interact?
  ○ Do the same empirical patterns hold in other languages (e.g. Spanish, Russian) with 
    this construction?
A An ellipsis approach

• An ellipsis approach of the target construction is empirically inadequate:
  • it does not generate a structure associated with the target interpretation and morphological marking:

  (30) a. bălgarsk-o pravitelstv-o i grăck-o pravitelstv-o
      bulgarian-sg.n government-sg.n and greek-sg.n government-sg.n
      ‘a Bulgarian government and a Greek government’
      → not the target morphological marking.
  b. bălgarsk-i pravitelstv-a i grăck-i pravitelstv-a
      bulgarian-pl government-pl and greek-pl government-pl
      ‘Bulgarian governments and Greek governments’
      → not the target interpretation or morphological marking
  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’
      → derivable (not with the target interpretation or morphological marking)
      but ungrammatical
  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’
      → derivable (not with the target interpretation or morphological marking)
      but ungrammatical

• Additional difficulties for an ellipsis account:
  ○ Why is the ellipsis obligatory?
  ○ Why is the ellipsis only backwards?

B Three empirical observations

1. 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)

   → the coordinate structure contributes plural features to the whole nominal phrase and
   they get distributed to other modifying adjectives via concord.
2. Adjectives that occur between the coordinated singular adjectives and the plural noun are plural:

(32) ljav-a-ta i djasn-a zadn-i gum-i
text-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 including an adjoined AP) and plural features get distributed via concord in the usual way.

3. There can be more than one adjective in each conjunct:

(33) černo-bjal-a-ta părv-a i pălno-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)

→ expected if the construction involves coordination of nominal constituents (nP) and not just APs.
Abbreviations


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