

Spellout and the Weak, Strong, Mixed Declension in German and Definiteness in Bulgarian*

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In this paper, I argue that certain features can be spelled out only once in certain languages. Specifically, the pattern of behavior of German and Bulgarian DPs can be attributed to the fact that the relevant feature - the gender feature in German DPs and the definiteness feature in Bulgarian DPs - can be spelled out only once. To analyze this pattern of behavior, I pursue an approach that assumes spellout of non-terminal elements and feature inheritance. I show that feature inheritance is limited by phase boundaries and argue that adverbials are invisible for the set-merge spellout procedure because they are merged by the pair-merge operation.

1. Introduction

It is known about German that it has the weak (1a), strong (1b) and mixed (1c) adjectival declension. The determiner marker *-er* can appear either on the definite article, as shown in (1a), or on the adjective, as shown in (1b) and (1c). However, it cannot coexist on both, as demonstrated in (2). The generalization drawn from this is that the adjective and the article compete for the same marker. If the marker is not present on the article, it must appear on the adjective.

- (1) a. der alte Mann
the old man-nom
b. alter Mann
old man-nom
c. ein alter Mann
an old man-nom
- (2) a. * der alter Mann
the old man-nom
b. * einer alter Mann
an old man-nom

In Bulgarian, the definite article *-ta* can appear either on a noun, as shown in (3a), or on an adjective, as in (3b) and (3c), but it cannot appear on more elements at the same time, as illustrated in (4). Thus, the generalization is that the noun and the adjective(s) compete for the same marker. And the marker must appear on the leftmost element in the DP; compare example (3c) with (5).

- (3) a. knigata
book-the
b. interesnata kniga
interesting-the book
c. goljamata interesna kniga
big-the interesting book
- (from Franks 2001)

* I would like to thank participants of the *Workshop on theoretical morphology 3* for their comments and suggestions. I would also like to thank Tarald Taraldsen for his valuable comments.

- (4) a. * interesnata knigata
 interesting-the book-the
 b. * goljamata interesnata knigata
 big-the interesting-the book-the
- (5) * goljama interesnata kniga
 big interesting-the book

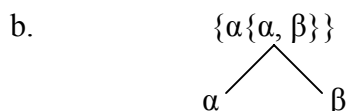
The rest of the paper is organized as follows. In section 2, I will introduce the background assumptions. Then, I will discuss the gender feature in German DPs and will develop an analysis that relies on spellout of non-terminal elements and feature inheritance. I will show that feature inheritance is limited by phase boundaries. Then I will turn to the definiteness feature in Bulgarian and will argue that it can be spelled out only once in DPs. I will also show that languages differ with respect to whether a certain feature is to be deleted after its spellout. I will discuss spellout of adverbials and argue that they are invisible for the proposed spellout procedure because they are merged by the pair-merger. Conclusions will be drawn in section 3.

2. Proposal

2.1. Background

Let us begin with the background assumptions. I follow Chomsky's set-merger proposal (1995); consider (6a). The proposal is illustrated by the tree with label α in (6b).

- (6) a. Chomsky (1995, 243-244)
 Merger of α and β forms $\{\gamma\{\alpha, \beta\}\}$, where γ is the label and α and β sets of features.
 The label (head) γ is either α or β .

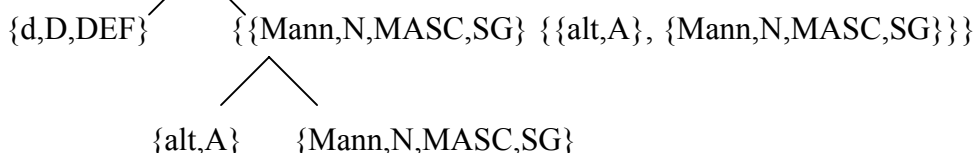


From this point of view, syntactic structure means growth of information, growing sets. Based on the set-merger proposal in (6), example (1a) *der alte Mann* is derived as follows. First, adjective *alt* is merged with *Mann*, which bears features 'noun', 'masculine' and 'singular', and they form the set with label $\{\text{Mann, N, MASC, SG}\}$, as shown in (7a). This set then is merged with *d* with features 'determiner' and 'definite' and now *d* determines the label, as demonstrated in (7b).

- (7) a. $\{\{\text{Mann, N, MASC, SG}\} \{\{\text{alt, A}\}, \{\text{Mann, N, MASC, SG}\}\}\}$

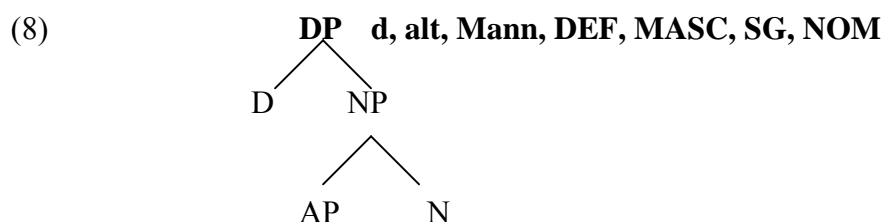


- b. $\{\{\text{d, D, DEF}\} \{\{\text{d, D, DEF}\}, \{\{\text{Mann, N, MASC, SG}\} \{\{\text{alt, A}\}, \{\text{Mann, N, MASC, SG}\}\}\}\}\}$



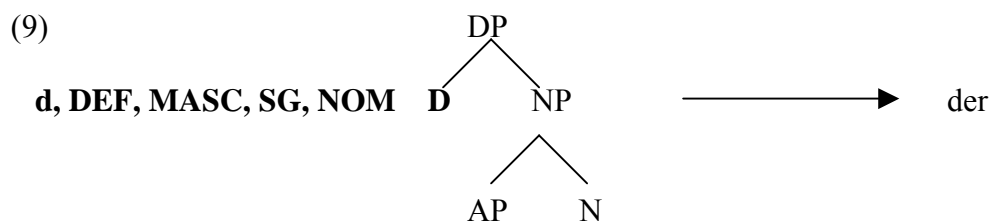
There is a morphological and syntactic commonality. Morphologically, as already said, the article and the adjective compete for the same marker *-er*. If the marker does not appear on the article, it must appear on the adjective. Syntactically, both competing elements are dominated by the common node DP, as illustrated in (7b). Because of these commonalities, I will pursue an approach that assumes spellout of non-terminal nodes (see Weerman & Evers-Vermeul 2002, Neeleman & Szendrői 2005, or Caha 2006) and employs feature inheritance.

Thus, spellout of nominal phrases begins with the DP node. As usual, in the course of derivation, the DP gets a case. In our example (1a), it is nominative. Then, after narrow syntax, the DP node with features to be spelled out looks like (8), which is simplified (7b).¹ However, in the lexicon, there is no vocabulary item that can realize *d*, *alt*, *Mann*, *DEF*, *MASC*, *SG*, *NOM*.



Therefore, as the next step, spellout goes down, first to the left to the specifier, as is standardly assumed, see Kayne (1994) or Fukui & Takano (1998). I distinguish between terminals (in our example *d*, *alt*, *Mann*) and their features (*DEF*, *MASC*, *SG*, *NOM*). I assume that terminals do not spell out other terminal roots – they can spell out just the inherited features - only non-terminal nodes can spell out more terminal roots. In other words, terminal roots are not inherited. This makes the job that is done by the agree relation or by the feature percolation (extended maximal projections) in other approaches, and has the advantage that it renders blocking of phrasal items (i.e. more complex items) by lexical items.

More specifically, now, the determiner node *d* with the definiteness feature *DEF* and the inherited features *MASC*, *SG*, *NOM* should be spelled out, as (9) demonstrates. For this combination, spellout finds *er* in the lexicon and it is inserted, which results in *der*.



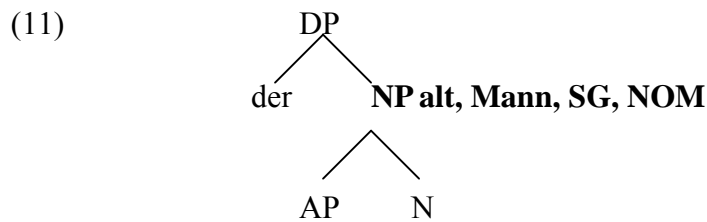
Sentence (10) shows that the determiner marker *-er*, which is common for personal pronouns and determiners, indeed can express case, gender and number; compare also table (14).

- (10) (D)er hat Probleme.
 (t)he has problems

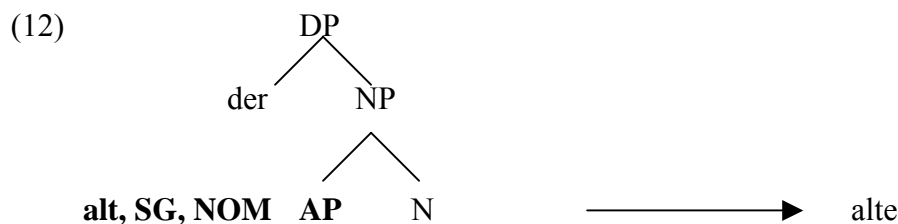
2.2. Deleted gender feature

¹ The number of occurrences of particular features does not play a role here, hence features are listed on the nodes only once, and brackets are omitted. For ease of exposition, from now on, I make use of the standard labels.

As the next step, spellout goes to the NP node with *alt*, *Mann* and the inherited features *SG*, *NOM*² but there is no vocabulary item for this NP in the lexicon (compare Schlenker 1997 who also proposes that features can be inherited, but in his proposal features can be transmitted only in a head-to-head way).



Then, spellout moves to the adjectival node with *alt* and with the inherited features *SG*, *NOM*, as illustrated in (12).



The question arises why marker *-e* appears on the adjective *alt* and not marker *-er* as on the head D. The reason for this is that the gender feature has already been deleted – specifically, it was deleted after spellout of D - because this feature can be spelled out only once in German.³ This proposal is supported by the mixed declension paradigm in (13). A comparison of (13) and the determiner marker paradigm in (14) shows that in cases where the determiner marker appears on *(k)ein* (*kein* = no, *ein* = a) in (13), the default marker *-en* appears on the adjective (the only exception is NOM/ACC.FEM.SG). If the determiner marker does not appear on *(k)ein*, it must appear on the adjective; consider NOM.MASC.SG and NOM/ACC.NEUT.SG.

(13) The mixed declension

	MASC	FEM	NEUT	PL
NOM	kein alter	keine alte	kein altes	keine alten
ACC	keinen alten	keine alte	kein altes	keine alten
GEN	keines alten	keiner alten	keines alten	keiner alten
DAT	kein em alten	keiner alten	kein em alten	keinen alten

(14) The determiner marker

	MASC	FEM	NEUT	PL
NOM	<i>er</i>	<i>e</i>	<i>es</i>	<i>e</i>
ACC	<i>en</i>	<i>e</i>	<i>es</i>	<i>e</i>
GEN	<i>es</i>	<i>er</i>	<i>es</i>	<i>er</i>
DAT	<i>em</i>	<i>er</i>	<i>em</i>	<i>en</i>

² For the gender feature, see below.

³ In DM words, *-er* cannot be inserted into environments without the gender feature because it would violate the Subset Principle because *-er* is specified for the masculine gender feature.

Given the fact that *(k)ein* appears only in singular and only in NOM.MASC and NOM/ACC.NEUT and the fact that marker *-es* is always common for NOM and ACC in NEUT.SG, the main task of the determiner marker (*-er* and *-es*) on the adjective in NOM.MASC.SG and NOM/ACC.NEUT.SG is to differentiate the masculine gender from the neuter gender.

Consider also (15) with the personal pronoun *du*. This example shows that the determiner marker *-er* disambiguates gender. The personal pronoun *du* expresses case and number but does not express gender. Thus, after spellout of *du* the gender feature is still alive. Consequently, the gender feature is spelled out on the adjective.

- (15) *du alt-er*
 you old

The same argument can be done with elliptical noun phrases in (16). In sentence (16a), the gender feature is spelled out on the head D (*d-er*), hence, it is deleted from the featural bundle,⁴ and the possessive pronoun gets just the adjectival marker *-e* (see discussion below). In contrast, in (16b), there is no article; hence the gender feature cannot be spelled out on it. And since the possessive pronoun *dein* itself does not express gender, the gender feature is spelled out on it as *-er*.

- (16) a. *Es ist der dein-e.*
 It is the your
 b. *Es ist dein-er.*
 It is your

Another question concerning (12) is why marker *-e* appears on *alt* and not the default adjectival marker *-en*.⁵ A look at the weak declension table in (17) reveals that marker *-e* prevents *-en* from appearing in adjectival singular structural case environments (with the exception of *-en* in ACC.MASC.SG). This exactly happens in (12). Since there are SG and NOM in the set of features, the marker *-e* must be inserted instead of the default *-en*. This shows that the case and number features - in contrast to the gender feature - cannot be deleted after their spellout.⁶

(17) The weak declension

	MASC	FEM	NEUT	PL
NOM	<i>der alte</i>	<i>die alte</i>	<i>das alte</i>	<i>die alten</i>
ACC	<i>den alten</i>	<i>die alte</i>	<i>das alte</i>	<i>die alten</i>
GEN	<i>des alten</i>	<i>der alten</i>	<i>des alten</i>	<i>der alten</i>
DAT	<i>dem alten</i>	<i>der alten</i>	<i>dem alten</i>	<i>den alten</i>

⁴ The same holds for the DEF feature; this feature does not play a role in the further spellout procedure.

⁵ The weak declension (17) and the mixed declension (13) show why *-en* is analyzed as the adjectival default marker; it can appear in all case environments as well as gender and number environments. In fact, *-(e)n* seems to be a general default marker in German. Consider e.g. its occurrences in verbal morphology *singen* (inf./1.pl./3.pl.), relatives *dessen, deren*, plural *Frauen*, or in the weak noun declension *Studenten*.

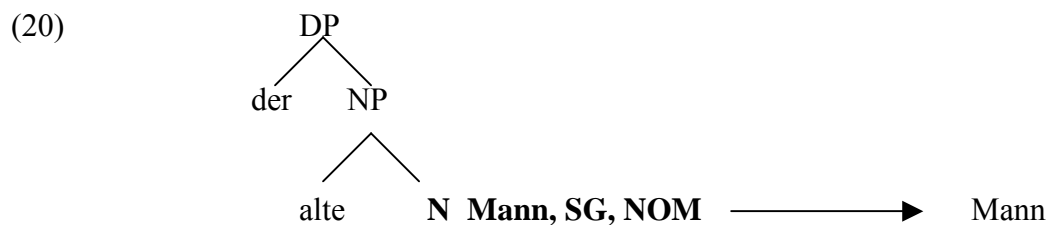
⁶ In German, like in many other languages with adjectival concord, multiple adjectives belonging to the same DP bear the same marker (with the exception of indeclinable adjectives). It seems that the unique spellout of the gender feature in German DPs should be specified with respect to categories because in the case of multiple adjectives in the strong and mixed declension the gender feature spells out x times. This means that the gender feature cannot be deleted from the featural bundle before the spellout procedure goes through all members of the A category.

That the case feature and the number feature are relevant for next steps of the spellout procedure, thus, they are inherited, is also supported by the weak noun declension. Example (18) demonstrates that *Bär* has different nominative markers for singular and plural and different case markers for nominative and dative. Note that the value of the case feature is not intrinsic to N – as already said, case is valued in narrow syntax - hence contrasts in (18) cannot only be determined by the noun. A comparison of (18) and (19) confirms that the definiteness feature - in contrast to the case and number feature - does not play a role in the lower spellout procedure.

- (18) a. der Bär
 the bear-nom
 b. dem Bär-en
 the bear-dat
 c. die Bär-en
 the bears-nom

- (19) a. ein Bär
 a bear-nom
 b. einem Bär-en
 a bear-dat
 c. Bär-en
 bears-nom

Let us come back to the derivation of *der alte Mann*. In the final step, the spellout procedure continues to the N node with *Mann* and the inherited features *SG*, *NOM* and consequently *Mann* is spelled out, as illustrated in (20).



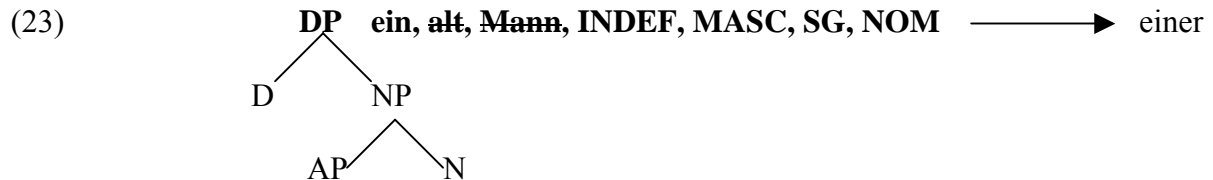
There are a few interesting issues concerning the gender feature in the mixed declension. As shown in (1c), the mixed adjectival declension has *ein alter Mann* for MASC.SG.NOM, where *-er* appears on the adjective and not on the article, contrary to the weak declension *der alte Mann*. However, marker *-er* can appear on *ein* (or *dein*), as shown in (21a) and (16b). It is possible only when the noun is not present overtly in the DP, as indicated by (21b) and (22). The emerging generalization is that the presence of the determiner marker *-er* on *ein* or *dein* is licensed by the ellipsis.

- (21) a. Einer kam.
 one came
 b. *Einer Mann kam.
 one man came

- (22) *deiner Mann
 your man

Depending on the context (on the elided material), the spellout procedure of *einer* can look e.g. like (23), where *einer* stands for *ein alter Mann*. It is clear that elements that are to be

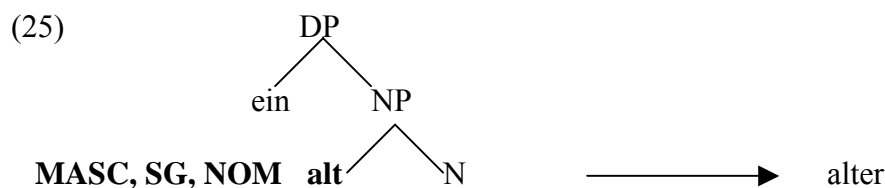
elided must be marked for deletion and that this information must be accessible for spellout. Thus, given the set-merger, there are, *ein*, ~~*alt*~~, ~~*Mann*~~, *INDEF*, *MASC*, *SG*, *NOM* on the DP node. This means that ~~*alt*~~, ~~*Mann*~~ are marked for deletion and that the spellout procedure – which begins with the DP node - sees this information.⁷ And since the determiner marker *-er* can spell out the features *MASC*, *SG*, *NOM* on the DP node, the DP node is spelled out as *einer*.



In the case of *ein alter Mann*, the DP node prepared for spellout has the same features but ~~*alt*~~, and ~~*Mann*~~ are not marked for deletion. Since there is no vocabulary item in the lexicon that can realize *ein*, ~~*alt*~~, ~~*Mann*~~, *INDEF*, *MASC*, *SG*, *NOM*, the spellout procedure must go to the D node with *ein*. Since *einer alte Mann* is ungrammatical, *-er* must be somehow blocked from appearing on the *ein* node. We have seen that the determiner marker can appear on an adjective, that is on the A node, as in (1b), and on *d*, that is on the D node, as in example (1a). Thus, the environment where the determiner marker cannot appear is the indefinite D node, which means that *-er* must be specified for some feature that can block its presence on this node. Therefore *-er* will also be negatively specified for the indefinite D head, as shown in (24).⁸

(24) er: [MASC, SG, NOM, -INDEF D]

Since *-er* cannot be inserted into the D node, the gender feature is not deleted from the featural bundle and spellout goes to the NP node. But there is no vocabulary item for ~~*alt*~~, ~~*Mann*~~, *MASC*, *SG*, *NOM* (the *INDEF* feature was deleted after spellout of *ein*), hence spellout goes to the AP (A) node with ~~*alt*~~ and the inherited features *MASC*, *SG*, *NOM*, as illustrated in (25). There, the determiner marker can be inserted (it is more specific than *-e* or *-en*, as shown below), thus after spellout of the N node as *Mann*, we get *ein alter Mann*.



So far we have seen that *ein* can spellout the DP node as well as the D node. It seems that *der* and *ein* do not always need to instantiate the same category. Consider example (26), where both elements co-occur in the DP, and where *ein(e)* spells out the node A. Then it is not surprising that the interpretation of *ein* – and the whole noun phrase - depends on which node it spells out. When *ein* spells out the D node, the DP gets the indefinite or specific indefinite

⁷ To be more accurate, this case would probably be an ellipsis of the NP node.

⁸ Alternatively, the markedness for deletion could be treated e.g. as a pron(ominalization) feature. This analysis would be preferred by Romance languages like Spanish or Italian. As pointed out to me by Tarald Taraldsen, e.g. in Spanish, the masculine marker *-o* does not appear on D (on articles) in singular, in contrast to the feminine marker *-a*. But *-o* can appear on D when the head noun is elided and even in cases where an adjective is present; see the contrast between *un nuevo libro* and *uno nuevo*. Since *uno nuevo* cannot be a spellout of the DP node, *uno* must be a spellout of the D node. Thus, *-o* on D would be licensed by the presence of the inherited pron feature in the featural bundle.

interpretation, when it spells out the A node, the DP gets the partitive or contrastive interpretation, and when *ein* spells out the DP node, it brings about the pronominal or anaphoric interpretation.

(26) *der eine Mann*

The feminine gender is even more interesting. There are the elliptical form *eine* (spellout of the DP node, as in the case of the masculine *einer*), the indefinite DP *eine Frau* (where *eine* spells out the D node), and *die eine Frau* (where *eine* spells out the A node) for FEM.SG.NOM; all with the exponent *-e*. Forms *eine Mann* and *eine Kind* are ungrammatical, therefore the determiner marker *-e* will be specified for the feminine gender, to block its appearing in masculine and neuter environments. Since *-e* can also appear in plural - consider paradigms in (13), (14) and (17) - this marker is specified as disjunction (27).

(27) *e*: [[FEM, SG] v [MASC/FEM/NEUT, PL]]⁹

The gender specification in plural is necessary because it blocks bad forms such as *die alte Männer* for MASC.PL.NOM/ACC. Since the gender feature is deleted after its spellout, i.e. after spellout of *die* in this case, marker (27) cannot be inserted into the A node *alt* (given the Subset Principle) and the default marker *-en* is inserted instead. And since the gender feature is also deleted after its spellout in feminine singular environments, it is clear that *-e* on e.g. *alte* in *eine alte Frau* in FEM.SG.NOM/ACC must be different from the marker in (27). Thus, I specify this type of *-e* as follows:

(28) *e*: [A, SG, STR]

The singular specification blocks this adjectival structural case marker from appearing on the A node in cases like **die alte Männer/Frauen* in PL.NOM/ACC in favor of the default marker *-en*. The adjectival specification blocks this type of *-e* from appearing on the D node in cases like **eine Mann/Kind* in MASC/NEUT.SG.NOM. And the structural specification favors *-e* against the default marker *-en* in adjectival structural case environments.

2.3. Non-deleted gender feature and phasehood

One may ask whether it holds generally that the gender feature is spelled out only once in DPs. There are languages showing that it is not a general rule. For example, in Czech, the gender feature is not deleted from the featural bundle. Consider the contrast between the feminine DP in (29a), and the masculine DP in (29b). In Latin, the gender feature must also be spelled out throughout the DP, as demonstrated by the contrast between the feminine DP *nulla magna civitas* in (30a) and the neuter *nullum magnum ingenium* in (30b). Thus, languages can differ with respect to whether or not a certain feature is to be deleted after its spellout.¹⁰

(29) a.	t-a	star-á	žen-a
	the-fem.sg.nom	old-fem.sg.nom	woman-fem.sg.nom
b.	t-en	star-ý	muž

⁹ This marker is blocked from the feminine and plural non-structural cases by more specific case markers. The fact that only the feminine gender is expressed in singular seems to be more general, see note 8.

¹⁰ As pointed out to me by Tarald Taraldsen, Manzini & Savoia (2005) show that in a dialect spoken in Colonnata when number spells out on D or Q, then it cannot be spelled out lower in the DP, i.e. on As or N. In contrast, gender (at least feminine) is spelled out throughout the DP.

the-masc.sg.nom old-masc.sg.nom man-masc.sg.nom

- (30) a. Null-a magn-a civitas quiescere potest
 no-fem.sg.nom big-fem.sg.nom state-fem.sg.nom to rest can
 ‘There cannot be a large state living in peace...’
 (Livius, Ab urbe condita libri CXLII)
- b. Null-um magn-um ingenium sine mixtura dementiae.
 no-neut.sg.nom big-neut.sg.nom nature-neut.sg.nom without mixture of madness
 ‘There is no one great ability without a mixture of madness.’
 (Seneca, De tranquillitate animi XVII. 10.)

Since the gender feature does not have to be deleted after its spellout in certain languages, the question arises how deep the featural inheritance can go. The prediction is that the featural inheritance is maximally one phase deep because phases are spellout domains. Chomsky (2005, 2006) argues that DPs are phases. Therefore I will test the prediction with *tisíc* ‘thousand’, which can categorially be noun or numeral. In example (31a), *tisíc* modifies *ženami* and agrees with it in case, gender and number. In contrast, in (31b), *tisíc* bears its gender and number feature and blocks agreement between the head noun *žen* and the demonstrative *tím*. This means that the prediction is valid because in (31a) there is one spellout domain – i.e. one DP – and in (31b) there are two spellout domains.

- (31) a. s t-ěmi tisíc-i star-ými žen-ami
 with the-fem.pl.instr thousand-fem.pl.instr old-fem.pl.instr women-fem.pl.instr
- b. s t-ím tisíc-em star-ých žen
 with the-masc.sg.instr thousand-masc.sg.instr old-fem.pl.gen women-fem.pl.gen

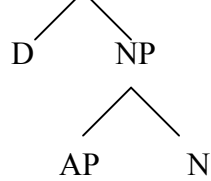
2.4. Definiteness feature

In this section, I turn to the definiteness feature in Bulgarian. We have seen that in Bulgarian DPs the noun and the adjective(s) compete for the definiteness marker and that the marker must appear on the leftmost element. Thus, we can employ the same analysis as in the case of the gender feature in German. Example (3b) *interesnata kniga* ‘the interesting book’ then is derived as shown in (32).

- (32) $\{\{t,D,def\} \{\{t,D,def\}, \{\{knig,N,FEM,SG\} \{\{interesn,A\}, \{knig,N,FEM,SG\}\}\}\}\}$
 $\{\{t,D,def\} \{\{knig,N,FEM,SG\} \{\{interesn,A\}, \{knig,N,FEM,SG\}\}\}\}$
 $\{\{interesn,A\} \{knig,N,FEM,SG\}\}$

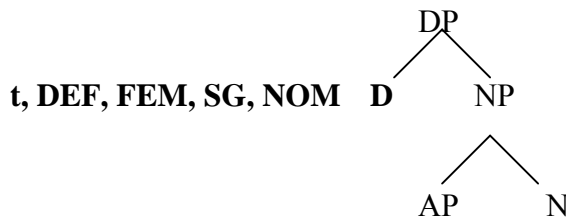
This DP gets a case in narrow syntax. Let us suppose that it is nominative. Then, the spellout procedure works as follows. Spellout begins with the DP node, which bears *t*, *interesn*, *knig*, *DEF*, *FEM*, *SG*, *NOM*, as shown in (33). However, there is no vocabulary item in the lexicon that can realize this node.

(33) **DP t, interesn, knig, DEF, FEM, SG, NOM**



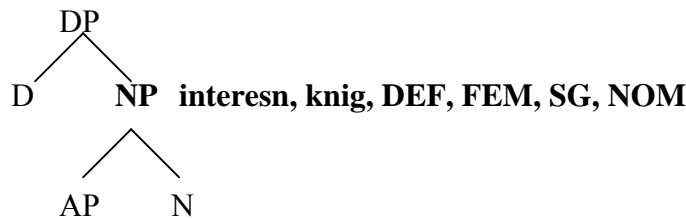
Therefore spellout goes down and the node **D** with its feature *DEF* and the inherited features *FEM*, *SG*, *NOM* should be spelled out, as demonstrated in (34). Spellout finds *-ta* but it cannot be spelled out by itself because it is specified as suffix in the lexicon. Thus, the definiteness feature cannot be deleted.

(34)



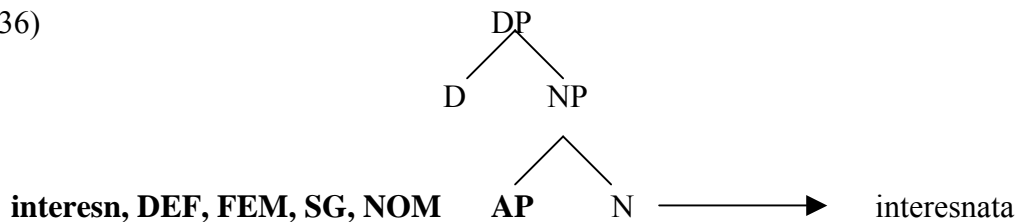
Spellout then continues with the node **NP**, as illustrated in (35). However, there is no vocabulary item in the lexicon that can realize *interesn, knig, DEF, FEM, SG, NOM*.

(35)



Thus, spellout goes to the adjectival node *interesn* and there features *DEF*, *FEM*, *SG*, *NOM* should be spelled out, as illustrated in (36). Spellout finds *interesna*, which can host suffix *-ta*. Thus, *interesnata* is inserted and the definiteness feature is deleted.

(36)

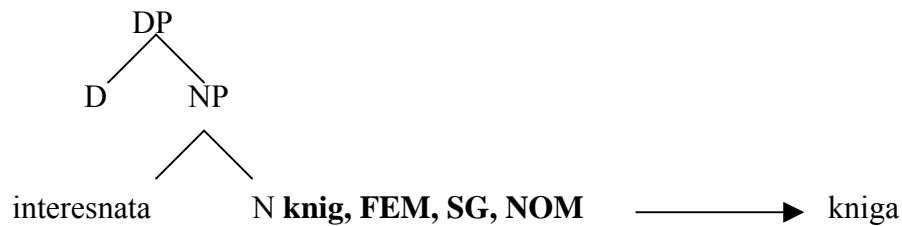


That the spellout of articles must wait for their host is also obvious from the fact that the form of the appropriate article is sensitive to phonological properties of its host.¹¹

Finally, spellout goes to the noun with features *FEM*, *SG*, *NOM* and consequently *kniga* is inserted. Since the definiteness feature can be spelled out only once in Bulgarian, we cannot get *knigata* here, as it is e.g. in (3a).

¹¹ This holds for both nouns and adjectives.

(37)



Similarly as in the case of the gender feature, there are languages in which the definiteness feature does not have to be deleted from the featural bundle. It is known that Arabic has definiteness concord. Both adjectives and nouns can take a definiteness marker and adjectives take the same definiteness marker as the noun they modify. Consider example (38a) for the indefinite definiteness feature and (38b) for the definite feature. Since the definiteness feature was not deleted after its spellout on the adjectival node, it is inherited by the node N and can be spelled out on it as well. Thus, in Arabic, in contrast to Bulgarian, the definiteness feature is specified as non-deletable.

- (38) a. rağul-u-n ʔawīl-u-n
man-nom-indef tall-nom-indef
b. al-rağul-u al-ʔawīl-u
def-man-nom def-tall-nom
- (from Kremers 2003)

2.5. Blocking of more complex spellout

An advantage of the present approach is that it can elegantly derive blocking effects. More specifically, spellout of a non-terminal node (i.e. a lexical form) can block spellout of more complex forms (phrasal forms). For example, in Danish, *hesten* (39a) can spellout the DP node. Generally, if there is a vocabulary item in the lexicon that can spell out the appropriate features, it must be inserted. Spellout simply cannot omit *hesten* and go down in the structure. Therefore *hesten* blocks the more complex form *den hest* (39b). The control example (39c) shows that the definiteness feature can be spelled out on the D node.

- (39) a. hest-en
horse-the
b.* den hest
the horse
c. den gamle hest
the old horse
- (from Hankamer & Mikkelsen 2004)

2.6. Spellout and pair-merger of adverbials

Data like (40) are a potential problem for the present approach. In the Bulgarian example in (40a), the definiteness marker is spelled out on the adjectival node but one would expect the marker on the adverbial node *mnogo* because spellout targets this node before the adjectival node. However, this spellout is ungrammatical, as shown in (40b).

- (40) a. mnogo xubavi-te knigi
very nice-the books
b.* mnogo-to xubavi knigi
very-the nice books
- (from Franks 2001)

Similar facts can be observed in Amharic. The definiteness marker is attached to the noun if it is the only word in the DP, as demonstrated in (41a). When an adjective precedes the noun, the definiteness marker must be attached to it, as shown in (41b). And when the adjective is modified by an adverbial, the definiteness marker appears on the adjective and not on the adverbial, as in Bulgarian, compare (41c) with (41d).

- (41) a. bet-u
house-def
b. tǐllik'-u bet
big-def house
c. [bət'am tǐllik'-u] bet
very big-def house
d.* [bət'am-u tǐllik'] bet
very-def big house (from Kramer 2007)

Kramer (2007) assumes that CPs and APs like the one in (41) – in her analysis DegPs - are phases, hence they are subject to the Phase Impenetrability Condition. She proposes that the morphological operation Local Dislocation cannot target elements in previously spelled out phases since the Phase Impenetrability Condition also holds at PF. Therefore the definiteness marker *-u* cannot attach to the adverbial *bət'am*, as shown in (41d), and attaches to the edge of the whole phase domain, as (41c) shows. However, such a phase analysis cannot be employed here because of data like (42) or (43).

- (42) [počti nerazrobotena-ta u nas] problematika
almost not-worked-out-def by us problematics
'the problematics (which are) almost not worked out here [in Bulgarian]'
(from Franks 2001)

In example (42) the definiteness marker *-ta* appears inside the adjectival domain, preceding the adverbial PP *u nas*, which should not be possible if the adjectival phrase were a phase. The example below shows that the same happens when the PP is argumental.

- (43) [vernǐ-jat na demokratični idej] prezident
faithful-def to democratic ideas president
'the president (who is) faithful to democratic ideas'
(from Franks 2001)

In Danish, even argumental PPs license the suffixed definiteness marker, as demonstrated in (44a). However, one would expect the definite article *den* because in the lexicon there is no vocabulary item for the whole DP *ejeren af grisen* and spellout must target the D node in the next step. But the definite article is ungrammatical in this case, as shown in (44b). This suggests that the PP *af grisen* is invisible for the spellout procedure, similarly as the adverbial *mnogo* (40), *bət'am* (41), or *počti* in (42).

- (44) a. ejer-en [af grisen]
owner-def of pig-def
b.* den ejer [af grisen]
def owner of pig-def (from Hankamer & Mikkelsen 2004)

To explain the peculiar behavior of adjuncts, Chomsky (2001) proposes that adjuncts - in contrast to other elements, which are merged by the symmetrical set-merge operation - are

merged by the pair-merge operation, which produces ordered pairs. I build on his proposal here but I assume that the set-merge operation applies to adverbials rather than adjuncts. This means that PPs such as in (44) are merged by the pair-merger but adjectives are merged by the set-merge operation. Recall that so far the spellout procedure has been based on the set-merger operation. Thus, if the pair-merged elements are not visible for this type of spellout, there must be two different types of the spellout procedure, one for set-merged elements and another one for pair-merged elements. This proposal seems to be supported by the ordering of affixes in Navajo verbs, see Hale (2001). Hale argues that preverbal-modifier affixes (iterative, distributive, preverbs) in Navajo verbs belong to a separate dimension, and in contrast to other affixes, they are ordered from right to left, in accordance with their semantic scope.

It has been argued that adverbials in English or Scandinavian do not block PF merger, which requires adjacency, see e.g. Bobaljik (1995). The argument goes as above, if an adverbial merged to the left of vP were visible for the set-merger spellout procedure, one would expect the T morphology on the adverbial, contrary to the facts; compare also Áfarli (1997) who argues that adverbials are merged in a third dimension.

3. Conclusion

I have argued that differences between the strong, weak and mixed adjectival declension in German are due to the gender feature that can be spelled out only once. The behavior of the definiteness marker in Bulgarian DPs can be attributed to the fact that the definiteness feature can also be spelled out only once. I have shown that it is not a general property of the definiteness and gender feature and that languages differ with respect to this property. I have argued that both phenomena can be straightforwardly analyzed in an approach that assumes spellout of non-terminal elements with feature inheritance. Then I have shown that feature inheritance cannot cross phase boundaries and argued that adverbials are invisible for the set-merge spellout procedure because they are merged by the pair-merge operation.

Appendix

(45) The strong declension

	MASC	FEM	NEUT	PL
NOM	<i>alter</i>	<i>alte</i>	<i>altes</i>	<i>alte</i>
ACC	<i>alten</i>	<i>alte</i>	<i>altes</i>	<i>alte</i>
GEN	<i>alten</i>	<i>alter</i>	<i>alten</i>	<i>alter</i>
DAT	<i>altem</i>	<i>alter</i>	<i>altem</i>	<i>alten</i>

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