Underspecification of nominal functional categories in Arabic and West Slavic

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ABSTRACT

Assuming that features on functional heads are variables (Borer 2005), we expect to find syntactic operations and functional elements that target and manipulate these variables beyond matching and valuation in AGREE. We argue that such syntactic operations and functional elements exist. This paper presents such a functional element: a polarity operator manipulating features of a nominal functional head it modifies. The empirical motivation for our proposal comes from parallel systematic homophony over the same set of functional interpretations and features within the nominal extended projection in West Slavic (here, Czech and Polish) and Arabic dialects, primarily Levantine Arabic.

KEYWORDS syntactic features · nominal categories · West Slavic · Arabic

1 PRINCIPLED OR ACCIDENTAL HOMOPHONY IN THE NOMINAL DOMAIN?

As has been noted, most prominently in Fassi Fehri (2017, 2018), the so-called feminine morpheme in Arabic displays a variety of functional uses. Strikingly, parallel behaviour is attested in West Slavic (with data generalizations here based on Czech and Polish) not so much involving gender marking as the so-called diminutive.[1] The default morphological formation of diminutives in Czech and Polish (henceforth, ᴋ; e.g., Czech *-ek*.M.SG, *-ka*.F.SG, *-ko*.N.SG etc.) yields a number of rather disparate functional applications. In its diminutive guise, this morpheme yields a degree interpretation, and often gives rise to additional pragmatic readings. Interestingly, the same morphological realization is *homophonous* with other functional morphemes: it can function as a nominalizer, a conceptual female-denoting marker, and as a group-forming morpheme.

As extensively discussed in Fassi Fehri (2018) and previous work, a very similar range of nominal functions and interpretations is also attested in Arabic varieties. Fassi Fehri's account is based on the Modern Standard and Moroccan varieties. Our data comes primarily from Levantine Arabic (LA), and with some lexical exceptions largely parallels the Modern Standard and Moroccan facts. The morpheme of interest, in the Arabistic literature called the feminine morpheme (henceforth, ꜰ), displays the same range of functional and semantic interpretations as West Slavic ᴋ but with some variation. First, Arabic ꜰ individuates, and in the dialect varieties we investigate here, the nominalizer function is attested as well, albeit restricted to only a couple of classes of nominal formations (abstract nouns and concepts).

We ask how this functional and interpretational variability in the nominal domain arises, and why we find parallel behavior in rather distinct language families, with funda-

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[1]A number of authors, for instance, Wągiel (2023) and Arsenijević & Borik (2020), point out that gender interacts with number in Slavic as well. However, the range of attested functional applications obtained with gender does not display the more fundamental parallelism we investigate in this paper.

mentally distinct morphological systems (concatenative versus templatic). Homophony over a number of functional interpretations within a single language, or even a single family of languages, is not surprising in and of itself, but parallel systematic homophony over the same set of functional interpretations and structural restrictions on their syntactic behavior and distributional/functional gaps across language families requires a structural explanation.

This paper argues against accidental homophony. Instead, we propose that both κ and ꜰ are morphological realizations of a feature bundle corresponding to an underspecified nominal functional head which we will call i^*, a notation loosely inspired by the interface-sensitive i^* head of Wood & Marantz (2017). Specifically, we propose that i^* is a head that functions as a polarity operator on features of its syntactic sisters. As we will demonstrate, i^* is a function that takes a specific feature of its sister as an argument and reverses the value of the said feature or group of features. Since i^* functions as a polarity operator it can only apply to a binary feature. Since i^* takes its core properties from the head whose features it modifies, the functional interpretation of i^* is a function of its structural position. That is to say, when i^* attaches to a category defining head, then it functions as a category defining head; when it attaches to an individuating head, then it functions as an individuating head, etc. Our account thus differs from proposals that account for this type of homophony by positing a series of semantically specified and distinct functional heads (e.g., Fassi Fehri 2017, 2018), or distinct morphemes (e.g., Borer & Ouwayda 2010).

The proposed implementation follows Borer (2005) (see also Acquaviva 2019) in that it treats features on functional heads as variables. If features are indeed variables, we expect to find syntactic operations and functional elements that target and manipulate these variables beyond matching and valuation in ᴀɢʀᴇᴇ. The result is an extreme but yet structurally restricted homophony in the functional domain.

Before we proceed, a note on the nature of morphological realizations is in order. Both for κ and ꜰ we refer to an abstract underlying morpheme that surfaces in a variety of forms. As for κ, its morphological realization is dependent on bundling with gender, number and case features that are realized within the same morpheme, giving a rise to a number of distinct surface realizations, including palatalizations of /k/. Since our focus is on the underlying syntactic features, we do not provide realizational rules for the surface realizations in this paper.[2] The Arabic ꜰ also surfaces in distinct forms, dependent on the templatic structure of the nominal. Most nominals do not display a gender-specific suffix, instead the gender realization is established within the corresponding nominal templates (we will see some examples when we discuss the diminutive formation). The i^*-driven realizations, on the other hand, surface as a suffix, realizing gender and number. While the prototypical formation in the dialects of interest is a suffix -*a*, some nominals combine with suffixal -*i*.

When not indicated otherwise, the data presented in this paper are based on our fieldwork. We thank Aya Zarka for help with data collection from Levantine Arabic. Czech and Polish data were collected by the authors. Generalizations about morphological productivity and the proposed morphological segmentation are largely based on extensive descriptions of morphological properties in Komárek et al. (1986). We want to acknowledge that the core of the empirical generalizations presented here is guided by the empirical insights of Fassi Fehri (2018) and the work cited there. We also want to thank two anonymous reviewers who helped us sharpen the Czech empirical generalizations by pointing out morphological and morpho-phonological facts we overlooked in the earlier version of this work.

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[2]There are a number of other derivational morphemes that resemble κ because of a partial phonotactic overlap, for instance, Czech augmentative -*isko* or instrument forming -*tko*. We have nothing to say about these derivational morphemes because they do not share distributional properties of κ.

Gender Change	F	K
MASC ⇒ FEM	✓	✓
FEM ⇒ MASC	✕	✕
* ⇒ NEUT	n/a	✕
NEUT ⇒ *	n/a	✕

Table 1: Feature profile in conceptual gender change

2 GUISES OF FUNCTIONAL K AND F

2.1 CONCEPTUAL GENDER

One place where we see parallel behavior between Slavic ᴋ and Arabic ꜰ is that these two morphemes systematically derive female-denoting nouns from masculine (where the masculine form either denotes a male, or may be ungendered; see, for example, Percus (2011) for discussion of unmarked gender), as can be seen in (1). In the example below, the Arabic ꜰ surfaces as the suffix -*a*. The Slavic ᴋ surfaces as the feminine singular allomorph.[3]

(1) a. far 'mouse.ᴍ.sɢ' → far-a 'mouse-ꜰ:ꜰ.sɢ, she mouse'   ʟᴀ
     b. daktor 'doctor.ᴍ.sɢ' → daktor-a 'doctor-ꜰ:ꜰ.sɢ., a female doctor'   ʟᴀ
     c. ředitel 'director.ᴍ.sɢ' → ředitel-ka 'director-ᴋ:ꜰ.sɢ, a female director' Cᴢᴇᴄʜ
     d. dyrektor 'director.ᴍ.sɢ' → dyrektor-ka 'director-ᴋ:ꜰ.sɢ, a female director'
                                                                               Pᴏʟɪsʜ
     e. kot 'cat.ᴍ.sɢ' → kot-ka 'cat-ᴋ:ꜰ.sɢ, she cat'   Pᴏʟɪsʜ

Note that only derivation from masculine, i.e., the unmarked gender value, to feminine (marked gender value) is attested. The reverse pattern is non-existent (see, e.g., Pesetsky 2013 for a generalization about the markedness profile of conceptual-gender denoting derivations), as are derivations involving neuter nouns, see Table 1.

2.2 CATEGORY CHANGE

In addition to deriving conceptual-gender denoting nouns, West Slavic ᴋ systematically functions as a nominalizer, that is, a category defining morpheme that combines with non-nominal stems and returns a nominal. Attested derivations include derivations of nouns from adjectives, as in (2), from verbs, as in (3), and possibly from prepositions, as in (4), although the productivity of this formation is limited to only a few nominals.

(2) a. sodová (voda) 'soda.ᴀᴅᴊ (water)' → sodov-ka 'soda-ᴋ:ꜰ.sɢ, pop'   Cᴢᴇᴄʜ
     b. mielon-y/-a 'minced.ᴀᴅᴊ-ᴍ/ꜰ' → mielon-ka 'luncheon_meat-ᴋ:ꜰ.sɢ'
                                                                               Pᴏʟɪsʜ

(3) a. doplnit 'to complement' → dopln-ěk 'complement-ᴋ:ᴍ.sɢ, a complement'
                                                                               Cᴢᴇᴄʜ
     b. podpalić 'to ignite' → podpał-ka 'accelerant-ᴋ:ꜰ.sɢ'   Pᴏʟɪsʜ

(4) a. před (domem) 'in front of (a/the house)' → před-ek 'front-ᴋ:ᴍ.sɢ, (the) front (of something)'   Cᴢᴇᴄʜ

When we look at the gender profile of these derivations, we see that even though Czech

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[3]An anonymous reviewer pointed out that the segment -*k*- appears in other types of conceptual denoting derivational morphology in Czech, specifically in -(*k*)*yně*: *soudce*.ᴍ.sɢ 'judge' – *soud-kyně*-ꜰ.sɢ. Here, the segment -*k*- results from a morphophonemic alternation of a category forming -*ec/ce*- within the masculine base of the nominal (*soud* 'court' – *soud-ce*.ᴍ.sɢ 'judge'). That is, the segment -*k*- might belong to the category changing instantiation of ᴋ that feeds into a further conceptual gender denoting morphology (-*yně*).

Category Change	F	K
ADJ $\Rightarrow$ N$_{masc}$	✓	✓
V $\Rightarrow$ N$_{masc}$	??	✓
ADJ $\Rightarrow$ N$_{fem}$	??	✓
V $\Rightarrow$ N$_{fem}$	??	✓
ADJ $\Rightarrow$ N$_{neut}$	n/a	×
V $\Rightarrow$ N$_{neut}$	n/a	×

Table 2: Feature profile in nominalizations

and Polish are three-way gender systems, this type of nominalization only yields masculine and feminine nouns.[4]

As an anonymous reviewer pointed out, there is an additional restriction on these nominalizations. Although the base appears to be verbal or prepositional, a more careful look at the form of the corresponding stem points to a presence of a nominal, or a nominal-like feature (they are derived from infinitives or participles, not bare verbal stems).

In Arabic, F is attested as a nominalizer as well, but it is less productive than in Slavic. F only derives abstract nouns from adjectives or count nouns. According to Fassi Fehri (2018), in most cases, this type of nominalization is formed from an adjectival base to denote the name of the property, quality, or abstract concept. We speculate that the observed restriction on productivity is a side effect of templatic morphology. That is, the underlying structural process might be present but we might not observe a suffixal formation.[5] The overall profile of feature interactions in the domain of nominalizations by K and F is summarized in Table 2.

2.3 NOUN TO NOUN CONVERSION

Slavic K displays an additional nominalization function, namely, that of noun-to-noun conversion. Strikingly, we again observe a restriction on the feature profile of these derivations. Noun-to-noun conversions can only be based on masculine or feminine nouns, and yield either masculine, or feminine nouns. That is, neuter nouns are excluded from this type of derivation. Furthermore, and perhaps, even more strikingly, this type of derivation reverses the gender value of the nominal input. That is, when the base is masculine, the derived output is feminine, and when the base is feminine, then the derived output is masculine.[6]

The derivation of grammatically FEM nouns from a MASC base is fully productive, and if plausible, often (but not always) ambiguous with a conceptual gender formation. Some examples are given in (5). The derivation of grammatically masculine nouns from a feminine base is less productive but still relatively frequent, (6). The overall profile of feature interactions in N-to-N conversions is summarized in Table 3. N-to-N conversions in Semitic are difficult to characterize because of templatic morphology.

(5)   a.   diplomat.M.SG → diplomat-ka 'diplomat-K:F.SG; a briefcase, a female diplomat'   CZECH
      b.   dyplomata.M.SG → dyplomat-ka 'diplomat-K:F.SG; a briefcase, a female diplomat'   POLISH

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[4]The gender systems are possibly four way, if one counts animate masculines, in the Polish grammar tradition called virile gender.

[5]Suggestive evidence for this position comes from the fact that genetically closely related but non-templatic Afro-Asiatic languages, such as Moroccan Berber, Hamar and Oromo, display a much wider range of nominalizations by F, including environments where we only see a templatic change in Arabic dialects.

[6]There are a handful of nouns that appear to preserve gender, including NEUTER to NEUTER formations. We put the same-gender cases aside: they are not productive, and suggestive evidence points to them being derived by lexical semantic shift from diminutives, instead of being derived by N-to-N conversion.

N-to-N Conversion	F	K
$N_{masc} \Rightarrow N_{fem}$	n/a	✓
$N_{masc} \Rightarrow N_{masc}$	n/a	✗
$N_{fem} \Rightarrow N_{masc}$	n/a	✓
$N_{fem} \Rightarrow N_{fem}$	n/a	✗
$N_{masc} \Rightarrow N_{neut}$	n/a	✗
$N_{fem} \Rightarrow N_{neut}$	n/a	✗
$N_{neut} \Rightarrow N_{masc}$	n/a	✗
$N_{neut} \Rightarrow N_{fem}$	n/a	✗
$N_{neut} \Rightarrow N_{neut}$	n/a	✗

Table 3: Feature profile in N-to-N conversions

      c.   stolarz.M.SG 'a carpenter' → stolar-ka 'carpenter-K:F.SG; carpentry (not a female carpenter)'   POLISH

(6)   a.   kůra 'tree-bark.F.SG' → kor-ek 'bark-K:M.SG, cork (a bottle stopper or the substance)'   CZECH

      b.   kora 'tree-bark.F.SG' → kor-ek 'bark-K:M.SG' cork (a bottle stopper or the substance)'   POLISH

2.4 DIMINUTIVES, THEIR DOUBLES & FRIENDS

Slavic languages display a range of morphologically distinct and lexically specified derivational morphemes expressing a diminutive-like meaning (see, for example, Steriopolo 2008, 2013, Wiltschko & Steriopolo 2007, Khrizman 2019). Here, we are only concerned with the default and fully productive form which appears to be derived by K as this is the only morpheme that feeds into the functional variability in the centre of our research investigation. Moreover, diminutive formation by K is highly productive. There are no gender restrictions on the input of this derivation. The output always preserves the gender of the base, (7).

(7)   a.   jablko 'apple.N.SG' → jablíč-ko 'apple-K:N.SG; a small apple'   CZECH
      b.   jáma 'pit.F.SG' → jam-ka 'pit-K:F.SG; a small hole'   CZECH
      c.   stůl 'table.M.SG' → stol-ek 'table-K:M.SG; a small table'   CZECH
      d.   pudło 'box.N.SG' → pudeł-ko 'box-K:N.SG; a small box'   POLISH
      e.   dziura 'hole.F.SG' → dziur-ka 'hole-K:F.SG; a small hole'   POLISH
      f.   słup 'pole.M.SG' → słup-ek 'pole-K:M.SG; a small pole'   POLISH

Crucially, diminutive formation by K can be applied recursively. A double application of K is the most frequent one but triple or quadruple applications are attested as well. Doubling yields an additional semantic reading (a higher degree of small size) or additional pragmatic readings (affectionate; e.g., Dressler & Barbaresi 1994, Jurafsky 1996, Fassi Fehri 2017). Triple and quadruple applications yield exaggerated affectionate readings. The recursive formation is gender preserving as well. Only the outermost suffix displays ϕ-features, (8).

(8)   stůl.M.SG 'a table' → stol-ek 'table-K:M.SG, a small table' → stol-eč-ek 'table-K:M.SG-K:M.SG, a very small table'   CZECH

The Arabic equivalent of the diminutive formation (denoting a small size) is realized as a stem-internal alternation (templatic morphology), with a range of attested types of alternations (a single vowel quality change in some cases, vowel change and gemination, or truncation in others). As with K, this diminutive formation does not change the gender of the base and is productive both for MASC and FEM nominals, (9). (The transcription

of Arabic examples comes from our primary language informant. The capital letter H corresponds to a pharyngeal fricative. Examples cited from the literature use the spelling used in the cited works.)

(9) a. daʔera 'circle.F.SG' → dowerra 'a small circle.F.SG'   LA
     b. bint 'girl.F.SG' → bannotta 'a little girl.F.SG'   LA
     c. arnab 'rabbit.M.SG' → arnub 'a small rabbit.M.SG'   LA
     d. mHammad.M.SG (proper name)
         → Hammod.M.SG (a familiar diminutive form of the proper name)   LA

Interestingly, as in West Slavic, the primary diminutive formation productively feeds into an additional layer of derivation, which semantically corresponds to the double-diminutive formation in West Slavic. In Arabic, the second layer of diminutives is realized by adding a suffix F to the primary diminutive formation, as in (10).

(10) a. arnab 'rabbit.M.SG' → arnub 'rabbit.DIM.M.SG' → arnub-i
          'rabbit.DIM.M.SG-F:SG'; 'a cute small rabbit'   LA
      b. mHammad.M.SG (proper name) → Hammod 'Hammad.DIM.M.SG'
          → Hammod-i 'Hammad.DIM.M.SG-F:SG'; 'cute/sweet Hammod'   LA
      c. Aya.F.SG (proper name) → Ayooš 'Aya.DIM.F.SG' → Ayoosh-i
          'Aya.DIM.F.SG-F:SG'; 'cute/sweet Aya'   LA

The stem-external morpheme F is both semantically and syntactically an adjunct (see, e.g., Wiltschko & Steriopolo 2007 for an argument that some diminutives are structurally adjuncts, while others are functional heads of the nominal). The most telling piece of evidence is that the stem-external F, which morphologically looks like a feminine singular suffix, is invisible for AGREE. The grammatical gender of the double-diminutives is strictly based on the grammatical gender of the nominal base. Consider the example in (11). Here the double diminutive form of *arnubi* 'a cute bunny,' derived from a grammatically masculine base (*arnab* 'rabbit', *arnub* 'small rabbit, bunny'), obligatorily triggers masculine agreement, despite its feminine suffix.

(11) al-arnub-i   nam   b-Hoḏ-ii
      the-rabbit.DIM.M.SG-F:SG sleep.3M.SG.PST in-lap-my
      'The cute bunny slept in my lap.'

When the relevant context is provided, *arnub-i* can also mean a female bunny. In this case F is a morphological reflex of conceptual gender instead of a double-diminutive. In this case, the nominal triggers feminine agreement:

(12) al-arnub-i   nam-et   b-Hoḏn-ii
      the-rabbit.DIM.M.SG-F:SG sleep.3PST-F.SG in-lap-my
      'The she-bunny slept in my lap.'

That is, even though morphophonologically the suffixes look the same (in the examples with *arnub* 'bunny' it is the suffix *-i*), the difference in the agreement patterns points to a different syntactic attachment.

Moreover, depending on the lexical content of the nominal, and the context, the same morphological formation can also yield an augmentative reading in Arabic. As with diminutives, the stem-internal derivation yields a pure augmentative interpretation (i.e., a large size of the nominal denoted by the base), and the stem-external derivation either adds a higher degree of large size (or importance etc.), or adds additional pragmatic readings. These derivations are also gender preserving, (13).

(13) raaḥil.M.SG 'traveler' → raḥḥaal.AUG.M.SG 'big traveler' → raḥḥaal-at
      'raḥḥaal.AUG.M.SG-F:SG'; 'famous big traveler'

MOROCCAN A.; Fassi Fehri (2017, 238, (40))

West Slavic κ does not yield augmentatives. There are other lexically specified derivational morphemes, some of them based on morphemes possibly related to κ, such as *-isko* as in the Czech *chlapisko* 'a large dude' (derived from *chlap* 'dude'), that yield related meanings (Steriopolo 2008, 2013, Khrizman 2019). None of them, to our knowledge, feeds into a double augmentative formation.

2.5 INDIVIDUATION

In Arabic, ꜰ also productively individuates (e.g., Zabbal 2002, Acquaviva 2008, Ouwayda 2014, Fassi Fehri 2018). Depending on the type of nominal input it takes, it either forms so called singulatives, i.e., individuated nouns from so called batch nouns, using the terminology of Borer & Ouwayda (2010) (other authors sometimes call these nouns collectives), as in (14), or individuated events, as in (15).

(14)   a.   Tabšuur 'chalk' (batch noun) → Tabšuur-a 'chalk-ꜰ:ꜱɢ'; 'a piece of chalk'

       LA

       b.   Saxr 'stone' (batch noun) → Saxr-a 'stone-ꜰ:ꜱɢ'; 'a piece of stone'   LA

(15)   a.   raqaṣa raqṣ-an
            danced dance-ᴀᴄᴄ
            'he danced some dancing'

       b.   raqaṣa raqṣ-at-an/   raqṣ-at-ayn
            danced dance-ꜰ:ꜱɢ-ᴀᴄᴄ/ dancedance-ꜰ:ꜱɢ-ᴅᴜ
            'he danced a dance/ two dances'

                                      Mᴏʀᴏᴄᴄᴀɴ A.; Fassi Fehri (2017, 226, (11))

Although certain additional restrictions apply, and they appear to be dialect specific,[7] both singulatives and individuated events can be further pluralized.

West Slavic κ does not individuate, not even in its diminutive use (in contrast to languages like Dutch or German; see, e.g., Borer 2005, Wiltschko 2006). We discuss the lack of individuation of diminutives in §3.2.

2.6 GROUP FORMATION

In Arabic, ꜰ also productively derives group formations (Borer 2005, Ouwayda 2014, Kramer & Winchester 2018), as in (16). Unlike singulatives, at least in Levantine and Lebanese Arabic, these group denoting nouns cannot be pluralized,[8] suggesting that semantically these are aggregates, i.e., maximized units formed from an already individuated content.

(16)   mtdyyen 'religious.ᴍ.ꜱɢ'; 'a believer' → mtdyn-i 'religious-ꜰ:ꜱɢ'; 'a religious group'   LA

In West Slavic, aggregates of this type are formed by ɴᴇᴜᴛᴇʀ (Grimm & Dočekal In press). We put neuter formations aside because they are orthogonal to the main topic of this paper. However, West Slavic exhibits a non-aggregate group formation by κ. This group formation is restricted to numerals, (17-a), and quantifiers (Veselovská 2018), (17-b). Since the derived forms are not aggregates, they can be pluralized without restrictions.

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[7]For example, Borer & Ouwayda (2010) report that the singulative must be definite or modified by an agreeing numeral (not all Arabic numerals combine with plural nominals; only the numerals that do license pluralized singulatives); adjectival modification is sufficient for pluralized individuated events. Note that the requirement to be further modified is attested with other individuating tools in the languages, for instance, with specific indefinites. The same set of restrictions seem to hold in Levantine Arabic (Aya Zarka, p.c.) but not in the Moroccan variety (A. Fassi Fehri, p.c.).

[8]The corresponding form exists but it means, for example, a group of female believers, instead of a plurality of groups of believers.

(17)   a.   dvě děvčata 'two girls' → dvoj-ka děvčat 'two-ᴋ:ꜰ.ꜱɢ girls.ɢᴇɴ, a group of two girls'   Cᴢᴇᴄʜ
        b.   pár děvčat 'a few girls' → pár-ek děvčat 'couple-ᴋ:ꜰ.ꜱɢ girls.ɢᴇɴ, a group of two girls'   Cᴢᴇᴄʜ

3 THE CASE FOR *i**

In the previous section we saw that the same morphological form, be it West Slavic ᴋ, or Arabic ꜰ, can express different types of derivational morphemes. This formation only appears in the domain that either is nominal or contains nominal features (for example, unvalued gender). Moreover, the formation expresses nominality as a categorical distinction, but it can also express a variety of nominal features (functional heads) throughout the extended nominal domain (gender, number, degree, person).[9]

We propose that this unusual homophony reflects that ᴋ and ꜰ are morphological realizations of an underspecified head which we call *i**, loosely inspired by the interface-sensitive *i** of Wood & Marantz (2017). Specifically, we argue that *i** is a polarity head, that is a function that takes a specific feature of its sister as an argument and reverses the value of the feature. Since a functional head is defined by its features, and since the functional identity of *i** is determined by the functional features of its sister, the output of *i** returns the same type of feature as the feature of its sister. The functional interpretation of *i** is thus a function of its structural position. When *i** attaches to a category defining head, then it functions as a category defining head; when it attaches to an individuating head, then it functions as an individuating head, etc. We argue that it is this feature operation process that yields the appearance of ᴋ and ꜰ being a morphological realization of distinct functional heads/features.

What features can *i** apply to? It appears, based on our data, that *i** can apply to any nominal feature as long as the feature is binary (or has a reversible value). Consequently, since *i** is underspecified, it can be merged at any level within the extended nominal domain, as long as the relevant projection contains a feature that is in the domain of the polarity function.

For concreteness, we assume that roots in Slavic (and possibly in Semitic) come with a gender index as part of their vocabulary insertion entry (e.g., Acquaviva 2014). The root merges with *n* that carries an unvalued gender feature, to be valued by the indexical gender of the root. We further assume that nominal roots are by default not individuated (e.g., Borer 2005, but see Fassi Fehri 2020 for an empirical critique of this assumption), and consequently, an individuating projection must be merged (ᴅɪᴠP), followed by a merge of a counting projection (#P). We further assume, following den Dikken (2019), that the animate person feature is located in πP, merged as the specifier of ᴅɪᴠP. Finally, a D head is merged. Since phasehood does not play any role in the data of our concern and the proposal, it is immaterial whether or not D is a phase head. The structure we assume is given in (18). Crucially, *i** can attach at any level of the extended nominal domain. The rest of the paper exemplifies the application of *i** throughout the structure.

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[9]In languages we do not discuss here, for example, Hamar, similar morphemes have been argued to also express specificity and case.

(18)

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                          DP
                    ┌──────┴──────┐
                    D            #P
                            ┌─────┴─────┐
                            #         DIVP
                          [NUM]    ┌────┴────┐
                                  πP       DIVP
                                        ┌────┴────┐
                                       DIV       nP
                                              ┌───┴───┐
                                              n     √root
                                          [GENDER]
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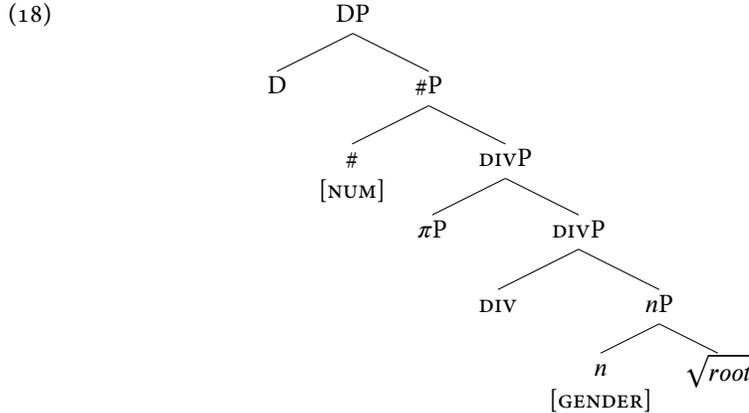
Before we proceed to the analysis, a couple of side notes are in order. First, not all languages with derivational diminutives and grammatical gender display this type of structural homophony (e.g., German, Dutch). Second, the default PF realization does not have to take the shape of a particular functional morpheme but might correspond to a morphophonological process instead (reduplication in Halkomelem Salish appears to be a plausible candidate). Third, spell-out domains and their relationship to the affixal versus templatic morphology in Arabic is likely to play a role in the case of F. We leave the question of spell-out domains for future research.

3.1 *i** AT THE CATEGORY HEAD LEVEL

When *i** merges to a category head, it outputs a polarized value of a feature of the categorizing head, and in effect it turns into a category head. Since *i** is a polarity head that operates in the nominal domain, we focus on cases in which the application of *i** relates to nominality. Concretely, we follow the observation that in Slavic and Semitic a *valued* gender feature is tied to nominality, and as such it is the defining feature of *n* (e.g., Kramer 2015, Veselovská 2018). Consequently, *i** can apply to [±*n*], where a [+*n*] value yields a valued [±GENDER] feature, and [−*n*] yields no valued gender.

Let us start with configurations in which *i** attaches to a category head specified as [+*n*]. Since [+*n*] is defined as the presence of a [±GENDER feature], *i** applies directly to this gender feature. Consequently, this application of *i** preserves the nominal properties of its structural input but outputs a polarized value of the gender feature. As we have seen in §2.3, noun to noun conversions by *i** only apply to masculine and feminine nouns, and the conversion always reverses the value of the gender feature. The schematic derivation of noun to noun conversions by *i** is given in (19-a). A concrete example of such a derivation is Polish *kora* 'tree-bark.F.SG' as the base, and *kor-ek* 'bark-K:M.SG' (meaning, cork as a bottle stopper or the substance) as the derived nominal form, with a schematic derivation given in (19-b).

(19)   a.
```
            i*=n
        POL[±GENDER]
      ┌──────┴──────┐
     i*             n
               [±GENDER]
              ┌───┴───┐
              n      √root
          [±GENDER]
```

b.
```
                  i*=n
        POL[+GENDER] ⇒ [−GENDER(m)]
          ┌──────────┴──────────┐
         i*                     n
          │                [+GENDER(F)]
       K: /ek/              ┌────┴────┐
                            n       √kor
                      [+GENDER(F)]
```
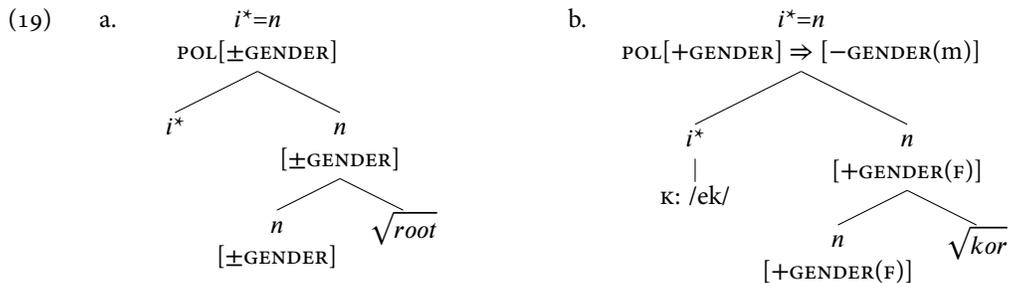
Why do we never see N-to-N conversions involving neuter? We argue that the reason for this restriction lies in the feature geometry of gender. Neuter in West Slavic has

been characterized as a complex feature, [−PERSON, −GENDER] (see, e.g., Kučerová & Bartošová 2016), that can only be introduced indexically by the root, or derived higher in the structure when a person feature is merged. However, when we take seriously the idea that *n* corresponds to [±GENDER], then neuter cannot be mapped as a valued feature onto *n*, either because the mapping fails or because the [−GENDER] part really is a lack of gender. The latter position is in line with work that points out that neuter seems to lack individuation property. Since gender has been frequently characterized as a classifier, neuter might be genderless. The consequence is that [−PERSON] might only be an implicated presupposition (in the sense of Sauerland 2008). That is, although neuter is an indexical feature on the root, it does not map onto a syntactic feature in the extended nominal projection. Coming back to N-to-N conversions by *i*⋆, since neuter has no syntactic feature representation on *n*, *i*⋆ cannot take neuter nominals as its input.

Let us now turn to configurations in which the category level projection is characterized as [−*n*]. When *i*⋆ applies at this level, we expect nominalizations from any category. As we saw in §2.2, *i*⋆ can indeed apply to any non-nominal category head (*a*P, *v*P, *p*P).

We need to be cautious though. If *i*⋆ only applies to binary features, we expect *i*⋆ to output [+*n*], which is effectively [±GENDER]. However, if we allowed *i*⋆ to effectively generate syntactic features, not only change their value, we would end up with a system that would be very difficult to constrain. Crucially, as pointed out by an anonymous reviewer, all attested nominalizations that seem to fall under the *i*⋆ label are based on non-nominal structures that contain a nominal feature. That is, in these derivations there is an existing nominal feature that both satisfies the requirement of *i*⋆ to only appear in a nominal domain – another key structural property restricting the proposed system – and provides a feature whose value can be amended by the application of *i*⋆.

When *i*⋆ applies to [−*n*] and outputs [+*n*], we expect the output nominalization to be either [+GENDER] or [−GENDER] because [+*n*] corresponds to [±GENDER]. This type of nominalization indeed always yields masculine or feminine nouns, i.e., a [± GENDER] value. It never generates neuter. The corresponding syntactic structure is given in (20-a). A concrete example of such a derivation is the Czech nominal *sodov-ka* 'soda-K:F.SG, pop' derived from *sodová* 'soda.ADJ', i.e., an adjective that comes to the derivation with unvalued ϕ-features. A schematic derivation is given in (20-b).[10]

(20) a.

$$i^\star = n$$
$$\text{POL}[-n, u\phi] \Rightarrow [+n, v\phi]$$

$i^\star$ $-n$
$[u\phi]$

$-n$ $\sqrt{root}$
$[u\phi]$

b.

$$i^\star = n$$
$$\text{POL}[-n, u\phi] \Rightarrow [+n, \text{F}]$$

$i^\star$ $-n$
K: /ka/ $[u\phi]$

$-n$ $\sqrt{sodov}$
$[u\phi]$
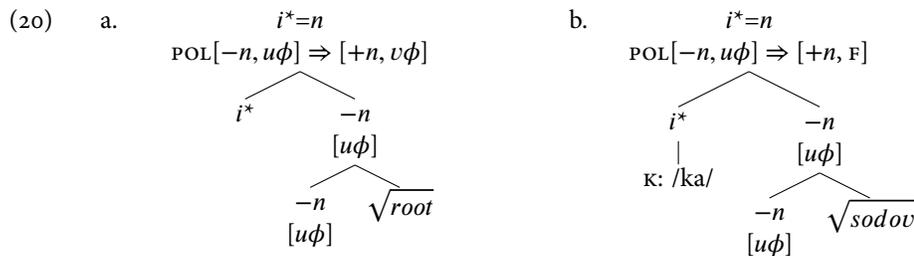
As for Arabic, we suggest that the category changing *i*⋆ in Arabic is not realized as a separate morpheme. Instead, it triggers insertion of a distinct template. Structurally, there is no difference between West Slavic and Arabic syntax, only an independent difference in morphological realization.

3.2 *i*⋆ AT THE DIV LEVEL

According to Borer (2005) DIVP is the locus of the [±DIV] feature, i.e., a feature that manipulates individuating properties of nominals underspecified for individuation from the lexicon. The same projection has also been proposed to host a person-feature projection

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[10]We have nothing to say about which value of the binary gender feature the system is going to choose. We know that gender for novel words is often assigned by semantic analogy with an existing nominal, and it is possible that here the feminine value arises because of semantic association with *sodová voda* 'soda water.F.SG' but we leave it to future research exactly what such analogy-based mapping might look like.

(πP; for conversation participants, i.e., animate nouns only) in its specifier (den Dikken 2019). Consequently, we expect $i^\star$ to manipulate either of these features.

Let us start with $i^\star$ applying to the [±DIV] feature. As we have seen, Arabic has a class of genderless unindividuated nominals, so-called batch nouns, in which the individuating functional head, DIV, is set up as [−DIV], (14). When $i^\star$ merges with this head, it changes the polarity of the DIV feature to [+DIV], forming an individuated nominal. Although certain restrictions apply, individuated structures can be further pluralized, as expected from the [+DIV] feature.[11] A schematic derivation is given in (21-a). A concrete example of such a derivation would be the derivation of the individuated noun *Saxr-a* 'stone-F:SG; a piece of stone' from the batch noun *Saxr* 'stone' (batch noun) in Levantine Arabic. The corresponding derivation is given in (21-b).

(21) a.

$$i^\star=\text{DIV}$$
$$\text{POL}[-\text{DIV}] \Rightarrow [+\text{DIV}]$$

$i^\star$ — DIV [−DIV]

DIV [−DIV] — $\sqrt{root}$

b.

$$i^\star=\text{DIV}$$
$$\text{POL}[-\text{DIV}] \Rightarrow [+\text{DIV}]$$

$i^\star$ — DIV [−DIV]

F: /-a/

DIV [−DIV] — $\sqrt{Saxr}$
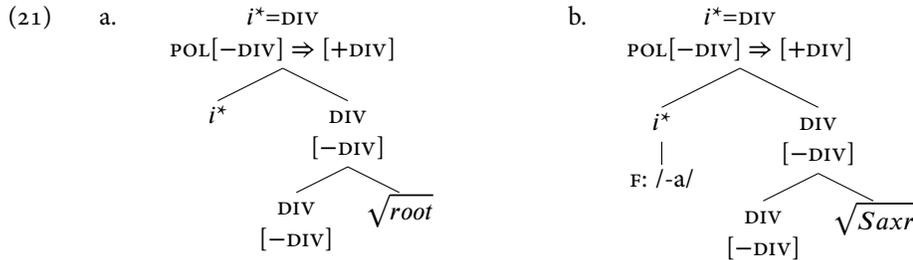
When the individuating head is set to [+DIV], $i^\star$ changes the polarity to [−DIV]. The formation of group interpretation by F, demonstrated in (16), constitutes such a case. A schematized derivation is given in (22-a). A concrete example is the derivation of the group noun *mtdyn-i* 'religious-F:SG, a religious group' from an individuated noun *mtdyyen* 'religious.M.SG, a believer' in Levantine Arabic. A schematic derivation is given in (22-b).

(22) a.

$$i^\star=\text{DIV}$$
$$\text{POL}[+\text{DIV}] \Rightarrow [-\text{DIV}]$$

$i^\star$ — DIV [+DIV]

DIV [+DIV] — $\sqrt{root}$

b.

$$i^\star=\text{DIV}$$
$$\text{POL}[+\text{DIV}] \Rightarrow [-\text{DIV}]$$

$i^\star$ — DIV [+DIV]

F: /-i/

DIV [+DIV] — $\sqrt{mtdyn}$
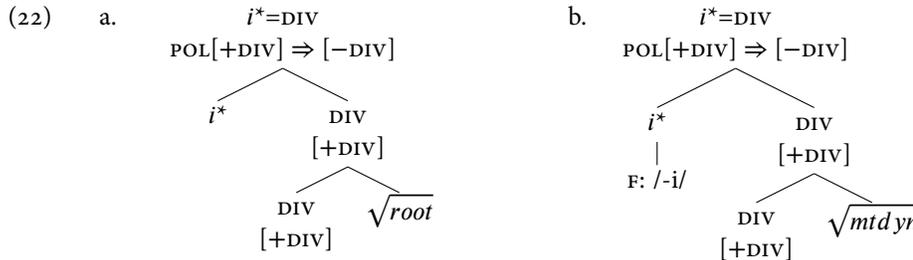
Note that even though the projecting feature is a DIV feature, the morphological realization is that of the so-called feminine suffix. Crucially, what we see here is that the morpheme F is not necessarily specified for gender, instead, it is the default morphological realization of a nominal application of $i^\star$.[12]

The individuation and group formation are absent in Czech and Polish. We propose that in these languages the DIV projection is set to a *general individuation feature*, in

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[11]The Arabic morpheme F also seems to individuate mass nouns, as in (i). We put these cases aside because they involve an additional templatic formation, and a shift in the lexical meaning, which indicates additional structure building and/or additional derivational morphology (similar to specific derivational morphology in Slavic). In fact, the template employed in this formation is a template used for names of instruments even with count nouns, as in (ii), which suggests a more general classifier-like morphological derivation.

(i)   sokkar 'sugar.MASS' → sokkareyy-i 'sugar-F:SG; a sugar bowl'   LA

(ii)   foren 'oven.M.SG → forneyy-i 'oven-F:F.SG; a portable electric oven'   LA

[12]Alternatively, one could propose that since Arabic does not have a specific morphology for marking individuation, the DIV feature triggers insertion of the closest feature with a classifier-like property, namely gender (F).

parallel to general number (e.g., Corbett 2000, Wiltschko 2008) – a move motivated by work on semantic properties of number in West Slavic nominals (see in particular Grimm & Dočekal In press, building on Krifka 1995). Crucially, a general individuation feature is a privative, not a binary, feature. Consequently, i^* cannot apply to this feature because i^* can only take binary features as its argument; hence the lack of individuation.

A further clarification on the lack of individuation is required though, because the Slavic ᴋ appears to give rise to individuation in the context of diminutives, specifically diminutive formations based on mass nouns. We believe that there is a confound. For a mass noun to be individuated, the mass noun must first be containerized. Once the denotation of containers is considered, it is not straightforward to distinguish between containerization as a result of individuation (a default container?) and a noun-to-noun conversion with a shift in the lexical semantics of the nominal base. If we apply stringent criteria on the lexical semantics of the container, it seems that ᴋ never individuates. Instead, both diminutives derived by ᴋ, as in (24), and their corresponding base, as in (23), are systematically ambiguous between mass and count interpretations. The examples in (23) are from Czech and demonstrate the behavior of a mass noun, here *cukr* 'sugar.' In (23-a), we see that this noun, in singular, has a syntactic distribution of a mass noun because it is compatible with a mass-compatible quantifier *mnoho* 'much.' The very same nominal, however, can also appear in the syntactic distribution of a count noun, as in (23-b), where it is selected by the quantifier *několik* 'several.' In this case, a containerized interpretation arises and the noun is inflected for plural (and genitive case).

(23) a. Na stole bylo mnoho cukru.
          on table was much   sugar.ᴍ.ꜱɢ.ᴍᴀꜱꜱ.ɢᴇɴ
          'There was much sugar on the table.'
      b. Na stole bylo několik cukrů.
          on table was sevaral sugar.ᴍ.ᴘʟ.ɢᴇɴ
          'There were several kinds of sugar/ pieces of sugar (cubes, packets of sugar) on the table.'

As we see in (24), also from Czech, a diminutive form of such a mass noun retains the same structural ambiguity. It can either appear in a mass-noun syntactic environment, as in (24-a), or it can behave like a count noun when containerized, as in (24-b).

(24) a. Na stole bylo mnoho cukř-íku.
          on table was much   sugar.ᴍ.ꜱɢ.ᴍᴀꜱꜱ-ᴋ:ᴍ.ꜱɢ.ɢᴇɴ
          'There was much cute/sweet/delicious sugar on the table.'
      b. Na stole bylo několik cukř-íků.
          on table was several sugar-ᴋ:ᴍ.ᴘʟ.ɢᴇɴ
          'There were many kinds of adorable sugar/ small pieces of sugar (cubes, packets of sugar) on the table.'

That is, the pattern in Slavic and Arabic is consistent with the generalization that diminutives individuate mass nouns only if the diminutive formation also changes the gender of its base, i.e., when the diminutive formation is not an adjunct (e.g., Dutch and German, see, e.g., Borer 2005, p. 92, ft. 6). However, as we have seen in §2.4, neither West Slavic ᴋ, nor Arabic ꜰ changes the gender of the base of a diminutive.

Let us now turn back to the question of merging i^* within the ᴅɪᴠP. As we have already mentioned, the ᴅɪᴠ projection can also host a person feature. Various evidence points to conceptual gender being introduced by a higher functional head (see, e.g., Pesetsky 2013, Kramer 2015), and its semantic interpretation being a function of presuppositions associated with a person feature (e.g., Heim 2008, Sudo 2012, Kučerová 2018). Moreover, the gender systems discussed here create a new grammatical dimension where the morpho-syntactically unmarked masculine becomes marked in an environment where it

denotes human. Supportive evidence comes from the fact that while human MASC gender exhibits distinct morphological behaviour, we are not aware of any morpho-syntactic differences between human denoting and non-human denoting feminine nouns. As for masculines, for example, in West Slavic, animate masculines morphologically distinguish nominative and accusative but inanimate ones do not. In Arabic, masculine plural suffixal formation (so called sound plural) is restricted to human denoting nouns. All other grammatically masculine nouns employ a templatic expression of plurality (typically, a vowel quality change within the templatic stem), not a plural suffix. Grammatically feminine nouns look morphologically the same, irrespective of whether they denote a human.

In order to account for human denoting masculine as being structurally distinct, we propose to tie them to a human denoting person feature. In particular, we follow den Dikken (2019) who proposes a special human denoting person projection (in his implementation, the projection is restricted to the 1st and the 2nd person; we generalize it to any human denoting person), namely, πP merged as the specifier of DIVP. We also slightly depart from den Dikken's proposal in that we expand his number projection into individuation and cardinal projection.

We further assume that human denoting masculine is a complex feature, namely, a privative [HUMAN/ANIMATE] feature and [−GENDER]. When i^* applies to this feature complex, the polarization function can only apply to the gender feature as it is the only binary feature in the domain, and in turn, it returns [+GENDER]. This application of i^* thus turns a masculine noun into a conceptually female denoting noun, as previously demonstrated in (1). A schematized derivation for the derivation of a conceptual gender by F and K is given in (25-a).[13] A concrete example of such a derivation is the derivation of the female denoting *daktor-a* 'doctor-F:F.SG., a female doctor' from its masculine counterpart *daktor* 'doctor.M.SG' in Levantine Arabic, schematized in (25-b).

(25)   a.

$$i^*=\text{DIV}$$
$$\text{POL}[-\text{GENDER}] \Rightarrow [+\text{GENDER}]$$

i^* DIV

π [HUMAN], [−GENDER]

DIV

DIV $\sqrt{root}$

b.

$$i^*=\text{DIV}$$
$$\text{POL}[-\text{GENDER}] \Rightarrow [+\text{GENDER}]$$

i^* DIV

F: /-a/

π [HUMAN], [−GENDER]

DIV

DIV $\sqrt{daktor}$

---

[13] The derivation strictly requires the [HUMAN] feature to be privative. If the feature were binary, for example, [+PERSON], we would expect the system to return [−PERSON, −GENDER], which corresponds to the neuter gender. As far as we know, in the languages we investigate here i^* never yields neuter but South Slavic languages exhibit neuter-feminine syncretism that affects countability of a nominal. See, for example, Alsina & Arsenijević (2012), Despić (2017). Ultimately, the exact feature geometry is an empirical question but as far as we can tell, πP only projects the privative feature, and the binary option might not be part of the feature geometry of the Slavic and Arabic nominal systems.

3.3 DIMINUTIVES AND THEIR DOUBLES

The last case to investigate is doubled diminutives and augmentatives. We assume, following much work on Slavic diminutives (e.g., Wiltschko & Steriopolo 2007), that primary diminutive formation is an adjunct. As we have seen, the supportive evidence comes from the fact that in West Slavic and Arabic the primary diminutive formation does not alter the gender of its nominal base. We depart from the existing work on Slavic diminutives in that we adjoin the diminutive formation to a DegP, following Borer (2005) who argues that N modification is only possible in the instance of a DegP, an optional functional projection within the extended nominal domain.

Crucially, we assume that the primary diminutive formation in West Slavic, although it shares morpho-phonological similarities with the κ of $i^\star$, is a regular diminutive functional head, which we call DIM.[14] The corresponding structure is given in (26-a). An example from Czech is the formation of the diminutive *stol-ek* 'table-DIM.M.SG, a small table' from *stůl*.M.SG 'a table.' Note that the stem of *stůl* is *stol-* as witnessed by non-nominative forms of the paradigm, for example the genitive singular *stol-u*. A schematic derivation of *stol-ek* is given in (26-b).

(26)   a.

    b.

When DIM attaches as an adjunct to a DegP, the only feature which is in the domain of $i^\star$ is the degree standard. We propose that the modification of the DegP by DIM changes the default POS feature, heading the DEG head and turns it into its NEG counterpart. That is, the modification by DIM changes the point of reference to be below the standard minimal value.

(27)   a. $[\![\text{POS}]\!] = \lambda g_{<e,d>} \; \lambda x.\text{standard } (g) \preceq g(x)$
        b. $[\![\text{NEG}]\!] = \lambda g_{<e,d>} \; \lambda x.\text{standard } (g) \succeq g(x)$

The adjunction attachment of DIM creates a configuration $i^\star$ can apply to. When $i^\star$ applies to DIM, it resets the scale to the minimal value of its input. However, the application of $i^\star$ effectively induces a recursive operation of the scale reversal. Since the same syntactic operation cannot be semantically vacuous (see, e.g., Sichel & Wiltschko 2021), the recursive application yields a new degree scale and can also yield an additional pragmatic reading (affection, or derogation; see, e.g., Fassi Fehri 2018). These pragmatic readings are not a direct product of feature interaction of $i^\star$ but rather a mapping of its morphosyntactic effects to the interfaces. A schematic representation of a double diminutive structure is given in (28-a). An example from Czech of the double diminutive formation is *stol-eč-ek* 'table-DIM.M.SG-κ:M.SG, a very small table' derived from *stol-ek* 'table-DIM.M.SG, a small table,' schematized in (28-b). Note that secondary palatalization changes the word final /k/ of the diminutive into /č/ in the context of a front vowel.

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[14] An anonymous reviewer inquired about morpho-phonological differences between the diminutive morpheme and the double realized by κ. This paper is primarily about syntax and we cannot fully develop a theory of morpho-phonological alternations but if these two seemingly identical morphemes have a different structural underpinning, it is not surprising if their morpho-phonological properties do not fully align.

(28) a.

DegP

DegP $i^\star=[\prec d_s 2]$

DegP   DIM$=[\prec d_s 1]$

Deg n
$d_s 1$

n $\sqrt{root}$

b.

DegP

DegP $i^\star=[\prec d_s 2]$
|
/-ek/

DegP   DIM$=[\prec d_s 1]$
|
/-eč/

Deg n
$d_s 1$

n $\sqrt{stol}$

In Arabic, the modification of a diminutive by F yields the same result as in West Slavic. Arabic dialects also allow F to modify an augmentative structure.[15] The structure of augmentatives is the same as diminutives but augmentatives change the point of reference above the standard maximal value without changing POS to NEG, and $i^\star$, in turn, applies to this input in a manner entirely parallel to the application of $i^\star$ on diminutives.

4 CONCLUSIONS AND OPEN QUESTIONS

Assuming that features on functional heads are variables (Borer 2005), we expect to find syntactic operations and functional elements that target and manipulate these variables beyond matching and valuation in AGREE. We present an empirical study that provides evidence for such functional elements, namely, Slavic K and Arabic F. We propose a new class of functional heads, here represented by $i^\star$, a polarity operator manipulating features of a functional head it modifies. The empirical motivation for our proposal comes from parallel systematic homophony over the same set of functional interpretations and features within the nominal extended projection.

There are of course many open questions, such as why these particular syntactic interpretations and why they are so parallel in unrelated languages, and whether we can find $i^\star$-like behavior in other projections as well. For example, the so-called reflexive (*se*) in Slavic might be a good candidate for $i^\star$ in vP.

ABBREVIATIONS

ACC	accusative	M(ASC)	masculine
AUG	augmentative	NEG	negation
DIM	diminutive	N(EUT)	neuter
DU	dual	PL	Plural
F(EM)	feminine	PST	Past
GEN	genitive	SG	Singular
LA	Levantine Arabic		

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[15]In Slavic, augmentation requires a specialized morphology formation.

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