ϕ-features at the syntax-semantics interface: Evidence from nominal inflection [*]

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While it has been recognized in the syntactic and semantics literature that gender and number features within a DP may be valued either from the syntactic structure (typically from the lexicon) or from the context (Corbett 1991, Dahl 2000, Wechsler and Zlatić 2000, 2003, Sauerland 2004, Wiltschko and Steriopolo 2007, Acquaviva 2008, Heim 2008, Wiltschko 2009, Spathas 2010, Sudo 2012, Matushansky 2013, Merchant 2014, among others), little is known about how these two types of valuation are established, and what structural properties underpin this distinction. Furthermore, there is a growing consensus that more than one structural element can be the source of the valued features, and that the structurally higher element tends to be responsible for the semantically informed value (for instance, $\sqrt{}$ and n in Kramer 2009, see Pesetsky 2013 and Landau 2016 for related configurational analyses). Yet it is far from clear what it means for features to be valued from the 'context,' and why the structural height of functional heads should make a difference with respect to whether or not a syntactic feature is going to be semantically interpreted.

This paper brings into the debate new data from Standard Italian and uses it to argue for a novel treatment of semantically interpretable ϕ-features, specifically gender. The Standard Italian nominal system morphologically marks two distinct genders, three distinct nominal classes (idiosyncratic nominal endings), and two numbers, a combination which lends itself to a theoretical investigation of complex gender interactions. Crucially, Italian nominal inflection also distinguishes between grammatical, i.e., idiosyncratic, and natural, i.e., context-dependent, gen-

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der. The main empirical focus of the paper is on names of professions that exhibit morpho-syntactically varied behavior: for some speakers, the root *chirurg-* 'surgeon' can denote a female even if it is grammatically masculine (*il chirurgo* 'the.M surgeon'[1]), while other speakers prefer a derived form with a distinct morphological feminine marker, be it a feminine determiner, or a combination of a feminine determiner and a feminine ending on the noun (*la chirurgo* 'the.F surgeon' vs *la chirurg-a* 'the.F surgeon-F). Some nouns, such as *avvocato* 'lawyer,' have the same range of the formal variation, even though there is a designated feminine derived noun (*avvocatessa* 'female lawyer'). The structural variability in turn allows us to investigate the timing of related syntactic operations and their interactions in a controlled way.

The paper has two parts. The first part presents an explicit Distributed Morphology model of Italian nominal morpho-syntax. I provide evidence that Italian nouns come in three distinct flavors, with one group being lexically specified for gender from the lexicon, and the other two unspecified. I show that type of gender specification has morpho-syntactic consequences. The first part of the paper provides the necessary groundwork for the main theoretical proposal presented in section 2. Section 2 elaborates on recent insights of phase theory (Chomsky 2001, 2008, 2013, Narita 2011) and insights of the formal semantic literature on the interpretation of gender features on pronouns (Heim 2008, Sudo 2012, among others). The section argues for a novel model of feature valuation in the syntax-semantic interface and explores under what circumstances a syntactic feature may be semantically interpretable. I will show that the morphology interface can access the narrow syntax representation at two different temporal points of the derivation within a phase: the earlier point – technically, Spell-Out – returns a morphological realization that is faithful to feature values present in narrow syntax, while the later point – technically, Transfer – allows for a narrow syntax representation to be enriched by the CI component. Thus, there is no syntactic distinction between interpretable and uninterpretable features: a syntactic feature appears to be interpretable only if it has been licensed by CI. Some readers may already be comfortable with the premise that some nouns might come with a gender specification from the lexicon while others get their gender feature valued only later in the derivation. These readers may wish to skip or skim the morpho-syntactic set up presented in section 1.

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[1]Throughout the paper, I mark gender in glosses on elements that agree in gender with the noun in question. Abbreviations used in the paper: M: masculine, F: feminine, GEN: gender, NUM: number, SG: singular, PL: plural, CL: class.

1 How many genders are there? A case study of feature valuation

In his foundational study of Spanish nominal inflection, Harris (1991) provides extensive evidence that gender and class markers[2] must be modeled as two separate entities. The same pattern that motivated Harris' conclusions arises in Standard Italian (Dressler and Thornton 1996, Thornton 2001, 2003a,b, Ferrari 2005, Ferrari-Bridgers 2007, 2008, among others). In general, native speakers of Italian share the intuition that vocalic endings on nominals correspond to grammatical gender.[3] Namely, a noun which in singular ends in *-o* is grammatically masculine (M) where grammatically masculine means that it triggers a masculine agreement on agreeing elements such as determiners or predicative adjectives, while nouns ending in *-a* are grammatically feminine (F), and nouns ending in *-e* can be either. Even though this correlation is frequent, a closer look at the data does not support this intuition beyond it being a statistical tendency.[4] While it is indeed the case that some nouns ending in *-o* are grammatically always masculine, such as *il libro* 'the.M book,' there is a handful of *-o* nouns that are grammatically always feminine such as *la mano* 'the.F hand.' Some *-o* nouns denoting people may be grammatically masculine or feminine depending on the natural gender of their referent, such as *il soprano, la soprano* 'the.M male soprano/sopranist, the.F soprano,' or *il chirurgo, la chirurgo* 'the.M surgeon, the.F surgeon.'[5]

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[2]I use the term 'class marker' as a descriptive label for idiosyncratic nominal vowel endings. The theoretical status of these markers is one of the questions to be addressed in this study.

[3]Unless indicated otherwise, the data are from my ongoing project with [left out for anonymity]. The data were collected either from native speakers or from systematic dictionary, grammar books, and internet searches.

[4]According to Ferrari-Bridgers (2007), 32% of Italian nouns in her database are feminine *-a* nouns and 32% are masculine *-o* nouns. Individual authors differ in how they treat 'exceptions.' While for Thornton (2001, 2003a,b) the exceptions are significant and require a separate treatment of class and gender, Ferrari (2005) and Ferrari-Bridgers (2007, 2008) believe that because the gender of 98% of Italian nouns can be predicted by hierarchically ordered rules (phonological, morphological, and semantic), gender does not need to be represented in the structure. Others, most notably Lampitelli (2010, 2014), assume that there is an isomorphic mapping between gender and vowel endings, that is, he does not acknowledge the existence of exceptions. As we will see throughout this paper, not distinguishing between gender and class misses an important empirical generalization.

[5]The agreement properties of nouns that may be grammatically feminine or masculine depending on the natural gender of their referent is complicated by various socio-linguistic factors, such as social prestige. I will discuss the variation in ending and agreement properties in detail in section 1.3.

The same type of gender variation is attested with nouns ending in -*a* and -*e* as well, for instance, *l'artista bravo* 'the-artist good.M' vs *l'artista brava* 'the-artist good.F,' *il giornalista* 'the.M journalist' vs *la giornalista* 'the.F journalist,' and *il preside* 'the.M head (of something)' vs *la preside* 'the.F head (of something),' *il vigile* 'the.M sentry' vs *la vigile* 'the.F sentry.'

Based on this data, we can conclude that class and grammatical gender cannot correspond to the same grammatical representation because the same ending can correspond to either gender and both genders can be realized by any of the vocalic endings. It follows that if both class and gender are part of the morpho-syntactic module,[6] they must be modeled as separate entities.

Interestingly, there is a class of nouns which challenges this conclusion, namely, nouns with endings that change depending on the *natural* gender of their referent. In these nouns, the so-called *mating nouns* of Harris (1991), the vocalic ending is strictly determined by the natural gender of the referent.[7] More precisely, if a mating noun ends in -*o*, for instance, *il bambino*, *il ragazzo*, then it denotes a male or an underspecified individual. Thus, *bambino* denotes a baby boy or a baby, while *ragazzo* denotes a boy or a child in general. In contrast, -*a* versions of mating nouns strictly denote females. Thus, *la bambina* is the baby girl, and *la ragazza* is the girl.[8]

The attested pattern thus raises the following questions: (i) What is the structural relationship between grammatical and natural gender? (ii) What is the relationship between class marker and gender? (iii) Why, in some instances, does natural gender 'rewrite' the nominal ending, while in others, it leaves it intact?

1.1 Dissociating class marker and gender

We have seen that we need to dissociate the grammatical realization of gender and class marker (or at least the nominal vocalic endings) in order to account for the basic data patterns in Standard Italian.[9] I argue that class is a strictly morpho-

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[6]I assume a Distributed Morphology style of grammar architecture (Halle and Marantz 1993); however, I will use the term 'morpho-syntactic' as a useful shortcut for syntactic features and representations that play a role in the morphological realization module.

[7]The notion of mating nouns is related to Corbett's notion of common gender. As the notion of common gender covers a wider range of phenomena, I will use the term mating noun only.

[8]See Percus (2011) for an extensive discussion of such examples.

[9]The system to be developed here departs from most of the existing literature for empirical and theoretical reasons. To my knowledge, none of the existing proposals takes into account the full range of data discussed here. Furthermore, none of the work investigates either the derivational consequences of the proposed structures to be discussed in section 1.4, or the syntax-semantics

phonological reflex of the root lexical specification (analogically to the treatment of theme vowels in Oltra Massuet 1999, Embick and Halle 2005, Embick and Noyer 2007), while the gender feature (as well as number) corresponds to a formal syntactic feature. Later we will need to distinguish between gender being an idiosyncratic part of the lexical specification and gender being introduced at the syntax-semantics interface (i.e., valued from the context), but for now the discussion concerns only grammatical gender.

If a class value and/or gender value is idiosyncratic, then it needs to be associated with the root already in the lexicon, be it a valued feature of some sort or a lexical diacritic.[10] Formally, the root is either stored in a lexicon as a nominal structure, i.e., a structure already including category-defining n:

$$n$$
$$n_{[\text{CL/GEN}]} \quad \sqrt{root}$$
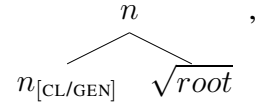
or the root comes with a valued class feature/diacritic which will restrict which functional head will be able to combine with such a root, $\sqrt{root}_{[\text{CL/GEN}]}$. As for the latter option, n would be merged in syntax (as category-defining n) and the class and/or gender feature value would be assigned via Agree between the root and n, or there would need to be a realization rule that would make the vocalic ending insertion sensitive to the properties of the root.[11]

The morphological realization of the noun then arises via some form of morphological affixation (be it m-merger, affix hopping, or whatever bound morpheme procedure the reader prefers) and morphological mapping based on the subset principle (Halle and Marantz 1993).[12] The mapping rules for n need to reflect number, which we do not have in the current toy system; the mapping rules in (1) will suffice for expository purposes.[13]

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(1)   a.   [CL:1, GEN:α] $\rightarrow$ -o
       b.   [CL:2, GEN:α] $\rightarrow$ -a
       c.   [CL:3, GEN:α] $\rightarrow$ -e

Since the system in place treats gender and class features as two separate variables, any gender feature can combine with any class feature, which is indeed the case. Thus, we straightforwardly derive the possibility of having masculine *-o* nouns, masculine *-a* nouns, feminine *-o* nouns, feminine *-a* nouns, masculine *-e* nouns, and feminine *-e* nouns.
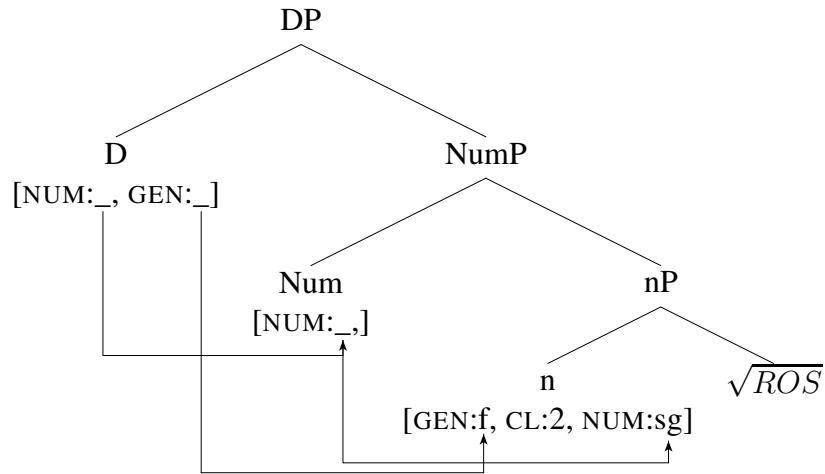
To obtain a complete DP, merger of D and Num is required (Ritter 1993, 1995, Borer 2005). Since D agrees in number and gender, it will need to have unvalued NUM and GEN features. For concreteness, let us assume that n comes from the lexicon with a valued number feature as well – a vast simplification but it will do for our purposes as number is not in the center of our investigation.[14] I use simplified labels F/M and SG/PL in order to avoid for now the question of the exact feature geometry.

I assume downward probing Agree, where matching and valuation are distinct operations (Chomsky 2000, Adger 2003, Pesetsky and Torrego 2007).[15] The complete step-by-step derivation of *la rosa* 'the.F rose' is given in (2).

(2)   *la rosa* 'the.F rose': feminine *-a* noun
         a.   feature distribution taken from the lexicon & feature matching:

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[14]See, for instance, Alexiadou (2011) and Ouwayda (2014) for a sophisticated argument that number, analogically to gender, may be valued in more than one place in the structure.

[15]With the system set up this way, gender and number features need to probe separately because if we included a requirement on ϕ-completeness, nothing would ever get valued within a DP. (See Danon 2011 for a detail discussion of the issue of ϕ-completeness within DP.) Since the exact representation of number is not the focus of this paper, I will remain agnostic as to whether this is an appropriate representation. Note also that the proposed model crucially assumes that nominal concord relations, at least the relation between D and its complement, are based on Agree. But see Norris (2014) for an alternative view.

DP
┌──────┴──────┐
D   NumP
[NUM:_, GEN:_]   ┌──────┴──────┐
                     Num   nP
                     [NUM:_,]   ┌────┴────┐
                                      n   √ROS
                                 [GEN:f, CL:2, NUM:sg]

b.   Feature valuation by Agree and morphological output:

DP
┌──────┴──────┐
D   NumP
[NUM:sg, GEN:f]   ┌──────┴──────┐
│   Num   nP
la   [NUM:sg]   ┌────┴────┐
                                      n   √ROS
                                 [GEN:f, CL:2, NUM:sg]   │
                                      │   ros-
                                     -a
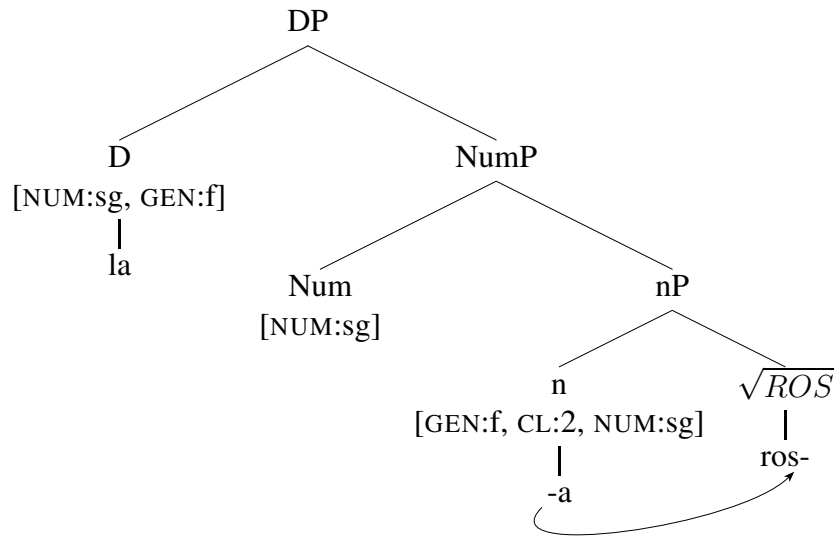
The same structure gives us a masculine *-o* noun such as *il libro* 'the.M book,' i.e., another case in which the vocalic ending seems to correspond to gender, simply by changing the value of the gender feature into M and the class into 1. In order to derive a feminine *-o* noun such as *la mano* 'the.F hand,' we need to alter only the value of gender on n. A simplified derivation is in (3). The boxes indicate which features are central to the morphological realization.[16]

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[16]For clarity of presentation the boxes do not include the number features even though the

(3)   *la mano* 'the.F hand': feminine *-o* noun
        $[_{DP}$ $[_{D}$ *la* $_{[\text{NUM}:sg,}$ $\boxed{\text{GEN} : f}$ $]$ $]$ $[_{nP}$ *-o* $_{[\text{GEN}:f,}$ $\boxed{\text{CL} : 1}$ $_{,\text{NUM}:sg]}$ *man* $]]$

The proposed model strictly separates gender and class. Even though they both need to be represented in the structure as they are crucial for morphological insertion, they fundamentally differ in that only gender interacts with the rest of the syntactic structure, simply because higher functional heads do not contain an unvalued class feature. Consequently, class does not interact with the structure beyond nP.[17]

1.2   Natural gender and the order of syntactic operations

We have already seen data suggesting that some nouns do not have their gender determined from the lexicon, as their gender may depend on the natural gender of their referent. Furthermore, we have seen that some nouns lack the class specification as well, as not only the gender of their determiner but also their vocalic ending is determined by the natural gender of their referent.

The former group is exemplified by *-o* nouns that can be grammatically either masculine or feminine, such as *il/la soprano* 'the.M/F soprano' and *il/la chirurgo* 'the.M/F surgeon.' The same gender duality accompanied by no change of the form of the noun itself is attested with *-a* nouns (for instance, *artista* 'artist' and *autista* 'driver') and *-e* nouns (e.g., *preside* 'head (of something)' and *vigile* 'watch person'). In this group of nouns, the vocalic ending is strictly determined by their class, but the gender may be determined by their natural referent.[18] The latter group corresponds to so-called mating nouns, i.e., nouns whose vocalic endings are dependent on the natural gender of their referent as well, such as *il bambino* 'the.M baby/baby boy' vs *la bambina* 'the.F baby girl,' *il ragazzo* 'the.M

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number value is crucial for the morphological realization as well.

[17]The system thus crucially differs from other proposals for Standard Italian that assume that class is some PF feature, most notably Ferrari (2005), Ferrari-Bridgers (2007, 2008), Lampitelli (2010, 2014), but that do not make a strict dissociation between class and gender. Even though these systems do well with the subset of data they concentrate on, they do not extend to the more complex patterns to be discussed in next sections.

[18]There is an asymmetry in the semantic interpretation of the gender on the determiner: while the grammatically masculine form (*il chirurgo*, *il soprano*) may denote a male or a female (*il chirurgo* being more often used to denote a male referent, *il soprano* a female), their feminine counterparts must denote a female. We will see in section 2.3 how the gender markedness follows from the theory of failed Agree combined with implicated presuppositions.

kid/boy' vs *la ragazza* 'the.F girl.' Table (4) summarizes the possible combinations.

(4)

| TYPE	CLASS?	GENDER FROM LEXICON?
il libr-o/la ros-a	✓	✓
il/la chirurg-o	✓	*
il bambin-o/la bambin-a	*	*

These empirical facts suggest that roots may come with a varied degree of nominal specification: (a) some roots are valued for class and gender, (b) some roots are valued only for class, and (c) some roots have no nominal specification, i.e., these roots are category neutral. I will call these three basic types of roots (a) conservative, (b) semi-conservative, and (c) liberal. The corresponding structures are in (5).[19,20]

(5)   *Possible root representations taken from the lexicon*

   a.   Conservative (*il libr-o/la ros-a*):
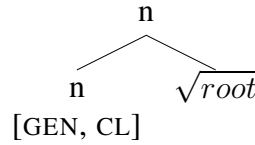
   b.   Semi-conservative (*il/la chirurg-o*):
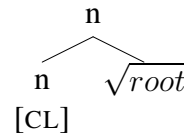
   c.   Liberal (*il bambin-o/la bambin-a*): $\sqrt{root}$

Furthermore, the distributional facts suggest that if gender is not valued from the lexicon, it is valued from the context.[21] Putting aside for now what it means to be "valued from the context" and how such an operation could be technically implemented, it is useful to see what consequences this intuitive parametrization has

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[19]The naming convention reflects that historically all Italian nouns had a theme vowel. The emergence of class-less nouns is a relatively new innovation.

[20]Theoretically, there could also be a gender-only root specification: As we
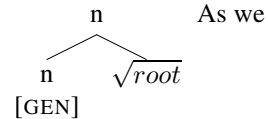
will see, such a representation is not empirically attested.

[21]We will see in section 1.4 that the gender of inanimate loan nouns, that is, nouns in which the referent does not associate with natural gender, is set to a default value.

for our proposed syntactic structure. If we assume that the lexically valued gender feature is part of narrow syntax while the contextually determined value may become available only at the syntax-semantics interface,[22] we predict that when an Agree operation is valued by the lexically specified gender feature, this valuation must happen *before* it may get valued by its contextual counterpart. Consequently, we predict the order of syntactic operations to be as in (6). For concreteness, I assume that the locus of the contextual valuation is D; since D is the phase head (or at least the labeling head in the extended lexical domain), it is the only functional head locally accessible to the CI interface at the point of Spell-Out. The proposed ordering follows from the mechanics of Agree. No additional stipulation is needed.

(6)   *The timing of syntactic operations:*
  (i)   merge of D
  (ii) ϕ-features on D probe ϕ-features on n
  (iii) matching
  (iv)   valuation by Agree using features already present in the structure
  (v)   valuation of D from the context for the features that have not been valued yet
  (vi)   automatic valuation by Agree of remaining features within the previously established matching link

Since the gender feature on D and the gender feature on n are part of the same Agree chain, D and n cannot undergo gender feature valuation independently of each other. Valuation via D is possible only if the gender feature on n has not been valued. Thus, depending on whether or not the root comes with a valued gender feature, we obtain two basic configurations of gender valuation within a DP:

(7)   *Configuration I: Gender from the context (D) (il bambino, la bambina; il/la chirurgo)*
  a.   Matching of unvalued gender features:

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[22]A non-trivial assumption I will argue for in detail in section 2.1.
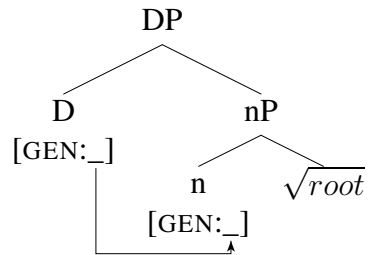
b. D cannot get valued by n because the gender feature on n is not valued $\rightarrow$ D valued from the context:
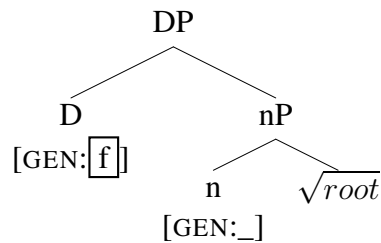
c. The gender feature on n gets automatically valued via the existing matching link with D:
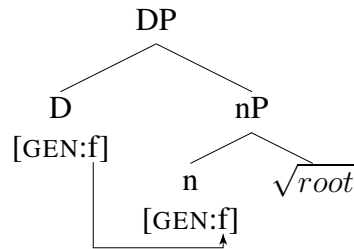
(8) *Configuration II: Gender from the lexicon (n) (il libro, la rosa)*

a. Matching of gender features on D and n:

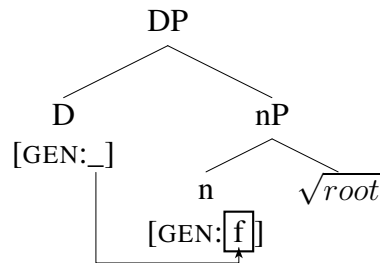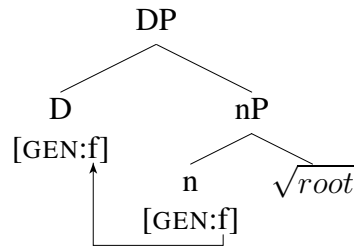b. Valuation of the gender feature on D by Agree with the valued gender feature on n:

DP
├─ D [GEN:f]
└─ nP
   ├─ n [GEN:f]
   └─ √root

Each of these configurations could in principle have a class feature on the root as well. Let us first consider Configuration I in (7), that is, the structure with no gender on the root. If the root comes with a class feature, we get a noun of the *il/la chirurgo* (the.M/F surgeon) type. If the root has no nominal specification, we obtain a mating noun, such as *il bambino/la bambina* (the.M baby/baby boy vs the.F baby girl).

A simplified derivation of *il chirurgo* 'the.M surgeon,' that is, a noun that comes with a class feature from the lexicon but has its gender value determined from the context, is given in (9). A simplified derivation of its feminine counterpart, i.e., *la chirurgo* 'the.F surgeon,' is given in (10). The only difference in the derivation is that this time the gender feature on D gets valued as feminine. In this configuration, agreement with the rest of the syntactic structure is strictly determined by the value of the gender feature introduced by D.

(9) *il chirurgo* 'the.M surgeon'

a. Feature distribution from the lexicon & matching:

DP
├─ D [GEN:_]
└─ n
   ├─ n [GEN:_, CL:1]
   └─ √CHIRURG

b. Feature valuation and morphological output:

DP
```
            DP
           /    \
          D       n
      [[GEN:m]]  /  \
          |     n    √CHIRURG
          il  [GEN:m, [CL:1]]    |
               |            chirurg-
               -o
```
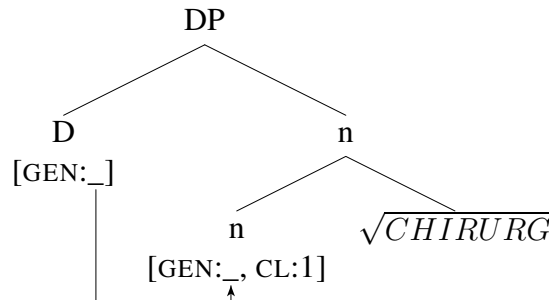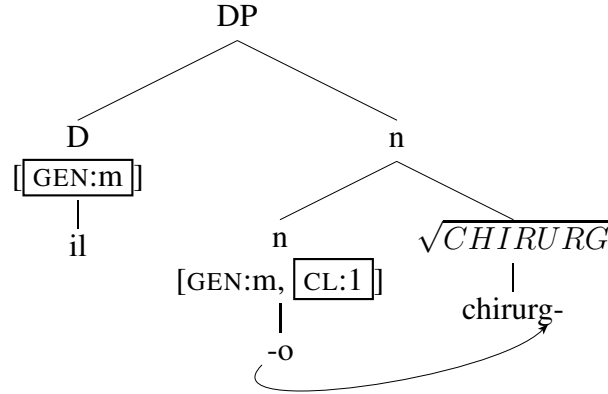
(10)   *la chirurgo* 'the.F surgeon'
       [$_{DP}$ [$_D$ *la* [[GEN : *f*]]] [$_{nP}$ *-o* $_{[GEN:f,[CL : 1]]}$ *chirurg*]]

Before we can see how exactly mating nouns are derived, we need to expand
our set of morphological mapping rules for n. The reason is that the vocalic end-
ing on these nouns is strictly determined by their contextually determined gender
but our mapping rules strictly require a class value. Thus, we need to add morpho-
logical mapping rules for cases in which there is no class feature. The expanded
set of morphological mapping rules is given in (11). As before, these rules leave
out number.

(11)   *Mapping rules for* n

       a.   [CL:1, GEN:α] $\leftrightarrow$ -o
       b.   [CL:2, GEN:α] $\leftrightarrow$ -a
       c.   [CL:3, GEN:α] $\leftrightarrow$ -e
       d.   [GEN:m] $\leftrightarrow$ -o
       e.   [GEN:f] $\leftrightarrow$ -a

With such mapping rules and the current system in place, we straightforwardly
derive the alternation attested in mating nouns, as the reader can verify for herself
in the simplified structures in (12).

(12)   a.   *il bambino* 'the.M baby/baby boy'
            [$_{DP}$ [$_D$ *il* [[GEN : *m*]]] [$_{nP}$ *-o* [[GEN : *m*]] *bambin*]]
       b.   *la bambina* 'the.F baby girl'

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$$[_{DP} [_D \ la_{[\boxed{\text{GEN} : f}]}] \ [_{nP} \ \text{-}a_{[\boxed{\text{GEN} : f}]} \ bambin \ ]]$$
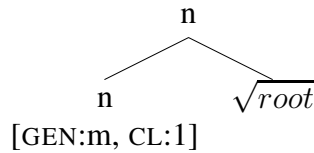
1.3 Valuation from the context vs valuation from the lexicon

As I mentioned in footnote 5, there is a persistent gender and agreement variation in the domain of names of professions. In most cases the variation has to do with sociological prestige being traditionally associated with maleness even if the profession now includes women. Good examples are *l'avvocato* 'the.M lawyer,' *il chirurgo* 'the.M surgeon,' and *il ministro* 'the.M minister.' We see a parallel grammatical variation with a noun like *il soprano* 'the.M soprano' that albeit being grammatically masculine typically[23] denotes a female singer but may denote a male singer, especially a boy, as well.[24]

Feminine versions of masculine nouns in Standard Italian may be formed with the feminine derivational suffix *-essa*, as in *avvocatessa* 'female lawyer.' Some speakers strongly prefer this formation. For other speakers, however, the feminine counterparts can be derived by inflectional morphology as well. That is, the original grammatical gender value from the lexicon is reanalyzed by some speakers so the noun denotation can accommodate current female uses. If we concentrate on the inflectional formation only, there are three attested forms that match the range of root specifications we saw in the previous section in (5), repeated here as (13):

(13)   *Possible root representations taken from the lexicon*

    a.   Conservative:

                 n
             n $\sqrt{root}$
      [GEN:m, CL:1]

    b.   Semi-conservative:

                 n
             n $\sqrt{root}$
      [CL:1]
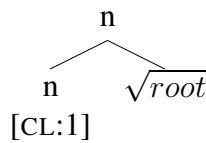
    c.   Liberal: $\sqrt{root}$

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[23]Historically, *il soprano* is subject to the same sociological shift as female voices in operas were typically performed by male singers until the end of the 18th century.

[24]While the sources of the variation, the variation's extent, and an accurate empirical description go beyond the scope of this paper, the attested variation sheds light on the proposed system, and, in turn, it allows us to investigate intricate interactions between natural and grammatical gender. Some of the variation described in this section has been noted in Thornton (2009). I am not aware of any theoretical linguistics contribution that considers the full range of the facts.

Speakers whose lexicon contains option (13c) thus produce *il ministro, la ministra* 'the.M minister, the.F minister,' *il soprano, la soprana* 'the.M male soprano/sopranist, the.F soprano,' *l'avvocato, l'avvocata* 'the.M lawyer, the.F lawyer.' Consequently, since D is valued only for natural gender, any agreeing elements in the structure will agree with this gender. Thus we get *il soprano bravo* 'the.M male soprano/sopranist good.M' and *la soprana brava* 'the.F soprano good.F.'

The speakers who prefer the semi-conservative option, (13b), produce *il soprano* and *la soprano*, i.e., nouns that do not store gender in the lexicon but still retain their class marker. Again, as with mating nouns, such nouns have the gender value on D determined by their referent, and agreeing syntactic elements agree with this gender. Thus we get *il soprano bravo* 'the.M male soprano/sopranist good.M' and *la soprano brava* 'the.F soprano good.F.'[25]

Finally, there are speakers that internally treat nouns like *il chirurgo* as grammatically masculine, that is, all elements within the extended DP are morphologically marked as masculine. These speakers seem to prefer the conservative option of (13a). Surprisingly, this seemingly grammatically masculine DP triggers feminine agreement on predicates, a fact the system developed here so far cannot account for.

Thus while prescriptive grammars require *avvocato* to be grammatically masculine even if the noun refers to a female, feminine agreement is common, as witnessed by following examples from the internet: *brava avvocato* [. . .] *una donna meravigliosa. . .* 'good.F lawyer.M [. . .] one.F woman.F wonderful.F' (Facebook; accessed on April 16, 2014); *brava avvocato, grazie di causa. . .* 'good.F lawyer.M, thanks to (the) case' (Twitter, February 2013). The same fact is acknowledged by other sources, such as the *Enciclopedia Italiana di scienze, lettere ed arti*, which gives the following examples of possible gender mismatch *il soprano è andato* 'the.M male soprano/sopranist is gone.M,' *il soprano è andata* 'the.M male soprano/sopranist is gone.F,' and *la soprano è andata* 'the.F soprano is gone.F.' The data show that both the determiner and the participle can be masculine (*il . . . andato*), or they both can be feminine (*la . . . andata*), or the determiner may be masculine but the participle feminine (*il . . . andata*).

The attested inter-speaker variation thus confirms the proposed model with three distinct representations of nominal roots. However, the mixed agreement pattern attested with the conservative option suggests that grammatical and natural

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[25]As far as I was able to establish, all adjectives have the same ϕ-features as the determiner, that is, we do not find a distinction between low and high adjectives of the sort reported in Pesetsky (2013) for gender in Russian, and Landau (2016) for number in Hebrew.

gender can co-occur within the same DP. We will turn to the question of what model of feature valuation would capture the full range of facts in section 2.

1.4 Predictions: category-neutral roots

Before we investigate the question of feature valuation, it is useful to consider some robust predictions the system makes to ensure that the proposed implementation is, in principle, on track. First of all, the current proposal makes a clear prediction that some roots should come from the lexicon as being specified for nominal features, while others seem to be category neutral. Since only mating nouns are based on category-neutral roots (as they do not carry any idiosyncratic marking from the lexicon), only mating nouns should have corresponding verbs derived from the same root with no special verbal derivational morphology, i.e., derived only by the default inflectional suffix *-are*. This prediction is borne out. As far as I have been able to establish, there are no verbs based on the roots of nouns that carry a class marker, as approximated in (14).[26] In contrast, mating nouns tend to have verbal counterparts, as seen in (15), based on examples from Fabrizio (2013).[27,28]

(14)   *Noun-verb pairs based on category-specific roots are nonexistent*
    a.   *il libro* 'the book' ↮ **librare* 'to book'

---

[26]Some of these pairs might be excluded on semantic grounds. What matters though is that I am not aware of *any* verb based on the same root as class-marked nouns (putting aside denominal verbs derived by specialized verbal morphology).

[27]Not all mating nouns have a verbal counterpart. This is presumably because of additional restrictions, such as the semantic interpretation of the root. What matters is that there are some that do. The theory also predicts that for the speakers whose grammar contains the (13c) representation for nouns like *il ministro, la ministra*, these nouns should be based on category-neutral roots and in turn they might have a verbal counterpart. This is partially confirmed as there is *avvocatare* 'to practice law,' but I have not found any other verb of this sort. This might be because this is a rather small group of nouns, and not all of them are compatible with a verbal interpretation. In addition, the relevant form might have already been lexicalized with a distinct meaning, such as *ministrare* which means 'to give food to someone.'

[28]The proposal makes a clear cross-linguistic prediction: languages with some form of grammatical gender and class marker should be limited in using noun-verb conversion as a derivational strategy, while noun-verb conversion should be productive in languages without lexically specified nominal classification of this sort. Although this prediction cannot be explored here, it is suggestive that Slavic languages with an extensive nominal classification system employ a direct noun-verb conversion only in a lexically limited domain, while this derivational strategy is highly productive in English (Plag 1999).

  b. *la rosa* 'the rose' ↮ **rosare* 'to rose'

(15) *Noun-verb pairs based on category-neutral roots*
  a. *la sposa* 'the bride,' *lo sposo* 'the groom' ↔ *sposare* 'to marry'
  b. *il figlio* 'the son,' *la figlia* 'the daughter' ↔ *figliare* 'to give birth'
  c. *l'astrologo*, *l'astrologa* 'astrologer' ↔ *astrologare* 'to practice astrology'
  d. *il monaco* 'the monk,' *la monaca* 'the nun' ↔ *monacare* 'to put someone into a convent, to make him/her become a monk/nun'
  e. *il commissario*, *la commissaria* 'commissioner' ↔ *commissariare* 'to put under a commissioner'

Another prediction concerns loan words. The class of a loan word and its related inflectional properties are often derived from the phonotactic shape of such a loan word (see for instance, Pesetsky and Torrego 2011 for a discussion of undeclinable loan words in Russian). If a loan word ends in a consonant, it cannot be associated with any class marker as the association with a class marker is strictly based on a word-final vowel.[29] Such a loan word cannot be associated with gender from the lexicon either as Italian does not have nouns that come with grammatical gender but no class from the lexicon. Consequently, consonant-final loan words should be based on category-neutral roots. Furthermore, if they denote objects, they cannot have their gender assigned by D as objects do not have a contextually determined gender. In turn, they should be realized with a default grammatical gender, namely, masculine.[30] The system thus predicts that consonant-final loan words should be masculine and that they should be able to have verbal counterparts derived without specialized verbal derivational morphology. Both of these

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[29]This follows only if class marker is indeed a separate entity, not if the vocalic ending is part of the root/stem.

[30]Thornton (2001) gives examples such as those in (i) as an argument for masculine to be the morphological default gender in Italian. As we see, if there is no ϕ-bundle in the structure that could serve as the goal for ϕ-Agree, the agreeing elements default to masculine.

(i) a. Andare a scuola è bello/ noioso/ faticoso
    to-go to school is beautiful.M/ boring.M/ hard.M
    'Going to school is beautiful/boring/hard.'
  b. È vero che Gianni è partito.
    is true.M that John is left
    'It is true that John left.'

                   (Thornton 2001, 483, (2))

predictions are borne out, as witnessed by the examples in (16).[31]

(16)   *Loan noun-verb pairs based on the same root*
  a.   *il chat* 'the.M chat' ↔ *chattare* 'to chat'
  b.   *il film* 'the.M film' ↔ *filmare* 'to film'
  c.   *il blog* 'the.M blog' ↔ *bloggare* 'to blog'

I will finish this section by investigating a slightly different prediction which concerns compounds; more precisely, V-N nominal compounds. If the gender of the nominal part of the compound is determined from the lexicon, then the compound should never inherit the gender of the noun, as the nominalizing D-n structure attached to the V-N compound cannot establish an Agree chain with the gender value on the nominal root. This is because neither D nor n can probe past the locality boundary created by the compounded V-N structure. The simplified tree in (17), modeled after Gracanin-Yuksek (2006), shows the basic structural relations. In Italian, V-N nominal compounds are exocentric right-headed compounds. I follow Gracanin-Yuksek (2006) in labeling the compounded part of the structure as V to indicate the selectional relation between the verbal and nominal part (the nominal part is semantical the internal argument of the event denoted by the verbal root) and that the nominal features of the head do not extend past the minimal compound domain.[32]

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[31] Another prediction concerns incorporated objects. According to Espinal and McNally (2011) certain verbs in Spanish and Catalan incorporate their objects, which is to say, the objects lack the D functional layer. Italian seems to have the same structural possibility. The prediction is clear. If the incorporated objects are NPs, we should never find nouns with a vocalic ending determined by D in them. Thus we expect to find *cercando avvocato*.M 'looking for a lawyer' or *avere bambino*.M 'wanting a baby' but not *cercando avvocata*.F 'looking for a female lawyer' or *avere bambina*.F 'wanting a baby girl.' Even though a google search confirms the prediction (the search returned thousands of instances of the -o versions but not a single one -a version), my preliminary fieldwork was not conclusive as my speakers strongly preferred forms like *avvocatessa* to *avvocata*, and in general it found incorporated objects to be restricted to only a few lexical items.

[32] An anonymous reviewer correctly pointed out that the proposed structure has structural properties of a nominalized structure, instead of a V-N compound in the sense of English compounds. I follow here the conventional terminology associated with these nominals in the existing Romance literature.

(17)

DP
├── D [GEN:_]
└── nP
    ├── n [GEN:_]
    └── V
        ├── V
        └── n
            ├── n [GEN:x]
            └── √root

x
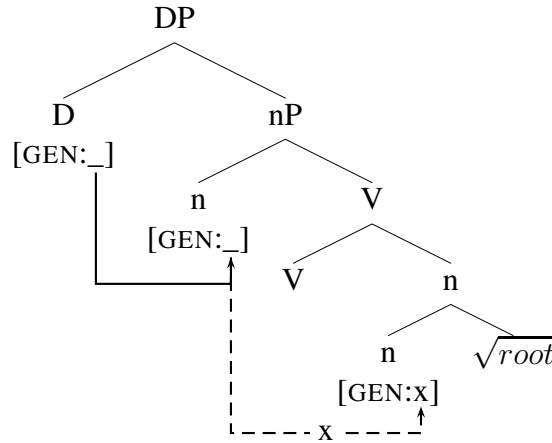
Furthermore, if such a compound denotes an inanimate entity, the compound should not be able to get the gender value from the context (via D) either, as the referent cannot semantically be associated with natural gender. Consequently, we expect such compounds to always surface with a default morphological gender, which is masculine (see fn. 30).[33] This prediction is borne out, as the following examples modeled after Gracanin-Yuksek (2006) demonstrate. Even though the root *mano* 'hand' comes from the lexicon with feminine gender, the gender feature cannot value the gender of D. In turn, the gender of the compound is masculine.[34]

(18)   *V-N compounds derived from mano 'hand'* – F.SG

    a.   *l'asciugamano* (M.SG.) *- gli asciugamani* (M.PL.)
        'the towel' - lit. the '(to) dry-hand'

    b.   *il baciamano* (M.SG.) *- i baciamani* (M.PL.)
        'hand kiss' - lit. the '(to) kiss-hand'

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[33] Such a default valuation results from failed Agree, in the sense of Preminger (2009).

[34] If the head noun of such a compound is a feminine noun of the *-a* class, the plural vocalic ending of the head noun morphologically corresponds to the feminine plural ending *-e*. Yet, the compound still triggers masculine plural agreement, as in *i*.M.PL *poggia-teste* 'the headrests' (Gracanin-Yuksek 2006, (12), 121). For this reason, Gracanin-Yuksek (2006) introduces two ns in her structure – one as the source of the noun inflection, one associated with a higher functional domain. I follow the core insight of her proposal without going into the details as they do not directly relate to the question at hand.

(19)

DP
├─ D
│   [GEN:*default*]
└─ nP
    ├─ n
    │   [GEN:*default*]
    └─ V
        ├─ V
        │   bacia
        └─ n
            ├─ n
            │   [GEN:f]
            └─ $\sqrt{MAN}$
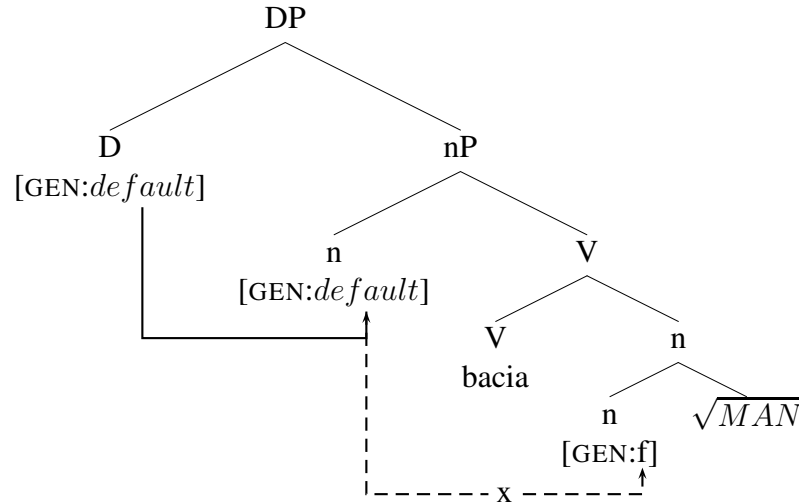
In contrast, if such a compound denotes a person, we expect its gender to be determined by the gender of its referent while its vocalic ending is determined by its lexically determined class. This prediction is borne out as well, as the following example shows.

(20)   un/ una ficca-naso
         a.M/ a.F thrust-nose
         'a busybody'   (Gracanin-Yuksek 2006, 114, (3))

To summarize, we have seen empirical evidence that Italian nouns come in three different structural configurations: some nouns come from the lexicon with class and grammatical gender, some with class but no grammatical gender, and some with no class and no gender. If a noun comes with no grammatical gender from the lexicon, gender may be determined from the context. The nature of context valuation is explored in the next section.

2   Features at the syntax-semantics interface

The data belong to a larger family of phenomena in which there is a difference between so-called grammatical and semantic/natural gender (Corbett 1991, Sauerland 2004, Wiltschko and Steriopolo 2007, Neeleman 2008, Matushansky 2013, among others), with some authors making an additional difference between lexical and referential gender (Dahl 2000, Wechsler and Zlatić 2000, 2003). A paral-

lel distinction has been made in semantic literature on the ϕ-feature specification of pronouns and other anaphoric elements. The relevant observations are that pronominal agreement and gender specification on pronouns is anaphoric, but the source of the relevant antecedent is in principle twofold (Heim and Kratzer 1998): the ϕ-feature valuation can be determined either from the structure (syntax) or from the context; and while some gender features are semantically interpreted, others are only morphological reflexes of some sort of feature transmission (von Stechow 2003, Heim 2008, Kratzer 2009, Sudo 2012, among others). In my analysis, I follow the essence of the semantic approaches and tie their findings to the syntactic analysis proposed in the previous section.

The core hypothesis I follow here is that the gender feature on D may be determined either by Agree with a gender feature valued from the lexicon, or the value can be determined from the context. If the feature on D is valued from the context, it is always semantically interpreted because the value restricts the natural gender of the referent, as illustrated by a classic example from Corbett (1991): 'The doctor said he/she could see me tomorrow.' If the valued feature comes from the lexicon, the empirical picture is complicated by the fact that the lexically determined gender often coincides with the denotation implied by the lexical semantics of the root. That is, it is not a priori clear whether *la donna* 'the.F woman' denotes a female referent by virtue of the lexical semantics of its root, the feminine gender feature determined from the lexicon, or both.[35] I will adopt the stronger position and argue that the gender feature valued from the lexicon is never semantically interpreted.[36] If there is a natural gender meaning associated with a DP, the semantic interpretation always comes from elsewhere.

Let us start by making the following assumption: for the morphological form of a definite article to depend on a contextually determined gender, the gender must be in some way represented in the structure of the DP, otherwise the morphological component would not know whether to insert *il* or *la*, etc. Once we make this assumption, three questions arise: First, where is this formal representation located? Second, if it is a formal feature, how does this feature get valued? Third, if the morphology module reflects a contextual/semantic valuation, is the valuation compatible with the Y-model of grammar?

The first question is explored in section 2.1, the second question in section 2.2. As for the last question, this grammar architecture consideration is not unique to

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[35] Dahl (2000) demonstrates a related point by a variant of Corbett's example: 'The woman said *he/she could see me tomorrow.'

[36] In syntactic terms, this amounts to saying that there is no distinction between interpretable and uninterpretable features, at least not for gender, as the gender feature is always uninterpretable.

gender. Instead, it arises in scope and morphological marking phenomena that are sensitive to semantic and pragmatic considerations (number, definite vs indefinite articles, quantifier raising, scrambling, etc.). The implementation proposed in this paper belongs to the family of recent works that argue for an economy condition that prefers isomorphic relations between interface representations; specifically, if the two interface representations differ, then we observe a derivational asymmetry which favors the LF representation over its PF counterpart (Williams 2003, Reinhart 2006, Bobaljik and Wurmbrand 2012, Kučerová 2012, among others). Which is to say, the morphological realization is sensitive to the semantically informed output representation. Section 2.3 is concerned with the question of how exactly this is done.

2.1 Phase Transfer as the source of contextually determined valuation

We have already seen, especially in section 1.4, that at least for some nouns gender is determined on the root[37] through the lexicon. However, if the gender value is contextually dependent, it cannot be determined on the root, unless we posit two distinct lexical entries – one for feminine, one for masculine.[38] If the contextually determined gender is not on the root, it needs to be located somewhere within the extended nominal projection, either as a valued feature, or as a dedicated functional projection consisting of the feature. This type of dissociation has been argued for in Sauerland (2004), Wiltschko and Steriopolo (2007), Steriopolo and Wiltschko (2008), Kramer (2009, 2015), Wiltschko (2009), Matushansky (2013), Pesetsky (2013), among others. The authors differ in where exactly they posit the other gender feature location, with the two main candidates being n, most prominently in Kramer (2009, 2015), and D, as in Sauerland (2004) and Steriopolo and Wiltschko (2008).[39]

As for the context-sensitive gender value, I argue that, at least in Standard Italian, it is assigned on D.[40] The corresponding syntactic structures for the two

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[37]By on the root, I mean within the nominally specific structure stored in the lexicon, in the sense discussed in the previous section.

[38]An analysis that posits two separate lexical entries predicts that any gaps in distribution would be accidental. As we have seen in the previous section, the distribution is structurally restricted.
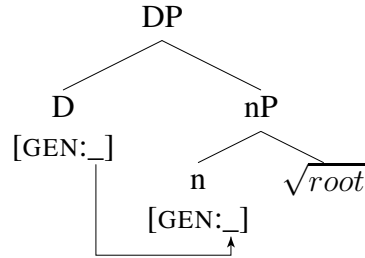
[39]A notable exception is Wiltschko (2009) and subsequent work which argues that languages differ in the exact location of the contextually determined feature, and in whether or not the corresponding functional head is syntactically an adjunct.

[40]If the contextual gender is assigned on D, NPs should never reflect natural gender. Data with
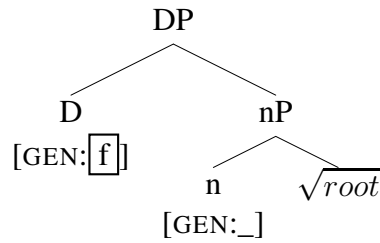
distinct places of valuation proposed in section 1.2, (7)–(8), are repeated below as (21) and (22).

(21)   *Configuration I: Gender from the context (D) (il bambino, la bambina)*

    a.   Matching of unvalued gender features:

```
                DP
              /    \
           D          nP
       [GEN:_]       /  \
           |        n    √root
           |    [GEN:_]
           └──────→
```

    b.   D cannot get valued by n because the gender feature on n is not valued $\rightarrow$ D valued from the context:

```
                DP
              /    \
           D          nP
       [GEN:[f]]     /  \
                    n    √root
                [GEN:_]
```

    c.   The gender feature on n gets automatically valued via the existing matching link with D:

```
                DP
              /    \
           D          nP
       [GEN:f]       /  \
           |        n    √root
           |    [GEN:f]
           └──────→
```
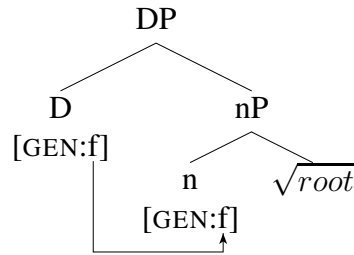
(22)   *Configuration II: Gender from the lexicon (n) (il libro, la rosa)*

    a.   Matching of gender features on D and n:

incorporated objects discussed in fn. 31 suggests that this prediction is indeed correct.
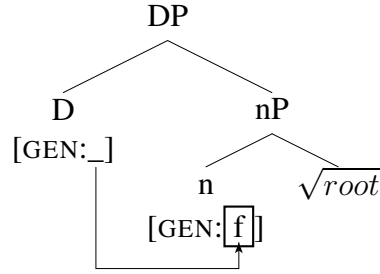
DP
┌─────┴─────┐
D   nP
[GEN:_]   ┌──┴──┐
              n   √root
           [GEN: f]

b. Valuation of the gender feature on D by Agree with the valued gender feature on n:

DP
┌─────┴─────┐
D   nP
[GEN:f]   ┌──┴──┐
              n   √root
           [GEN:f]

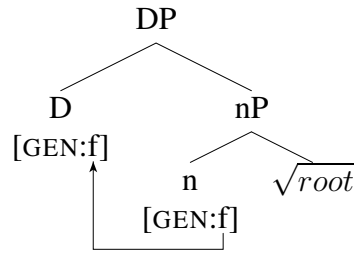The core assumption is that a formal syntactic feature can be assigned a context-sensitive value only at the syntax-semantics interface. More precisely, the only point during the syntactic derivation when a formal syntactic feature may be valued by the CI component is when the phase is sent to the syntax-semantics interface (so-called Transfer). For concreteness, I model valuation by the CI component as minimal search in the sense of Chomsky (2008, 2013) and Narita (2011) and argue that contextual valuation takes place as part of labeling of the transferred phase. Since the label is determined by features of the phase head, only unvalued features on D may get valued by CI at Transfer. Crucially, if such a phase gets selected by a higher syntactic structure, the feature valued by CI will now be visible for Agree within the narrow syntax derivation and may in turn value other instances of formal syntactic features.[41]

If the locus of the semantic feature valuation is a phase head, one might wonder whether such a feature could be assigned to n head instead, assuming nP might be a phase as well (Kramer 2009, 2015). The idea is that only a complete DP can interact with natural gender because the assignment of natural gender is tied to establishing a referential address (via PERSON[42], as we will see in next

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[41]Suggestive evidence for the phase head being the source of valuation comes from the fact that historically, gender marking on attributive demonstratives and determiners preceded agreement markers (Corbett 1991).

[42]I use small caps to systematically denote PERSON as syntactic feature. I do not adopt the same

section). In other words, the semantic properties of DP provide a formal trigger for minimal search from CI.[43] In contrast, nP does not have the right semantic interpretation. Properties, as discussed in fn. 31, have only grammatical gender. In turn, the semantic component cannot associate nP with a natural gender feature. Formally, there is no feature on n that would trigger minimal search by CI. While nP might be a complete unit from the point of view of narrow syntactic derivation, only DP forms a semantically complete unit, i.e., a structure that can be sent to the CI (Chomsky 2008, 2013, Larson 2011, Arsenijević and Hinzen 2012).

The next section argues that contextual valuation is dependent on PERSON, a feature that is visible both to the narrow syntax and the CI module. Before I proceed to the investigation of gender and PERSON, a couple of notes are in order. An attentive reader might wonder whether the proposed system utilizes some notion of semantic agreement. Though it might superficially seem to be the case, so far the system is based strictly on the syntactic notion of Agree.[44]

Finally, the proposal is intellectually indebted to the insights of Wechsler and Zlatić (2000, 2003) who to my knowledge were the first to make a clear distinction between class ('declension'), valuation within narrow syntax ('concord'), valuation from the context ('index'), and semantic interpretation ('semantics'). Some of the distinctions between their proposal and my proposal are solely attributable to differences in the architecture between HPSG and the Minimalist Program. Other distinctions, however, are more fundamental, such as differences in the lex-

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convention for gender and number as there are numerous instances of these terms in the paper that simultaneously refer to the syntactic object and its morphological realization.

[43]The relevant structure typically corresponds to an individual (semantic type e). However, as pointed out by an anonymous reviewer, restricting the semantic requirement to individuals and in turn to referential interpretation is too strong as it predicts that indefinites and quantifiers never get natural gender interpretation. This is not the case as we find reflexes of natural gender with indefinites and some quantifiers. For instance, one participant in an online discussion of persuasive gender inequality in the contemporary Italian society lists among professions that do not really exist *nessuna chirurga* 'no.F surgeon.F' (a post from September 6, 2008, http://www.mentecritica.net/matteo-73/oldstuff/comandante-nebbia/6496/). Although I do not discuss QPs and indefinites here, I use the notion of index (modeled as a variable and getting its value via an assignment function in the sense of Heim and Kratzer 1998) and a referential address (in the sense of quantifier referential-like properties discussed in Endriss 2009) to avoid this incorrect prediction.

[44]The proposed system might seem reminiscent of Collins and Postal (2012) and their idea that there might be a pronoun embedded within a syntactically larger DP. In the present proposal, however, there are no two distinct values of ϕ-features. The purpose of D being modeled as a bundle of ϕ-features is to have a formalization of how natural gender values might be made accessible to syntax proper.

icon representation and the formal dependency between gender and PERSON to be explored next.

2.2 Licensing PERSON at the CI interface

We currently have two sources of gender valuation: the gender value of a DP can be either determined idiosyncratically from the lexicon, or be supplied by D. Crucially, D seems to provide a gender value only if D refers to an animate referent, more precisely to a human or anthropomorphous referent.[45] In order to explain this correlation, we first need to understand the properties of gender with respect to other syntactic features. I argue that contextually determined gender is dependent on properties of another syntactic feature, namely PERSON (Harley and Ritter 2002, Béjar and Rezac 2003, Adger and Harbour 2007, among others). Furthermore, I argue that the syntactic dependency has a semantic counterpart: the interpretive difference between a grammatical and a contextually determined gender feature results from the *association* of gender and PERSON, instead of the gender feature *per se*.

The central role of the PERSON feature for the syntax-semantics interface has been argued for both in the syntactic and semantic literature, starting with the foundational work of Ritter (1995) who to my knowledge was the first to associate the PERSON feature with the D head. Recently, most prominently Longobardi (2008), Landau (2010) and Sudo (2012) argued for a connection between the PERSON feature and a semantic (referential) index. I follow this line of work and argue that the PERSON feature is the core narrow-syntax feature that plays a role in the mapping of ϕ-features onto the semantic representation. More precisely, if we model PERSON as [±participant] (Nevins 2007 and the literature cited there), the PERSON feature is the most obvious candidate for a syntactic counterpart of a semantic index (i). Technically, an index is a numerical index, i.e., a variable that is mapped to semantic values by an assignment function (Heim and Kratzer 1998).[46] The crucial assumption here is that although ϕ-features in narrow syn-

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[45]I use the term anthropomorphous somewhat loosely to have a cover term for instances of animate objects that grammatically display natural gender properties.

[46]Using variable representations avoids some non-trivial difficulties associated with constructing context-dependent valuation as Agree. Technically, as we will see shortly, binding such features in syntactic terms corresponds to two separate processes: valuation of PERSON with respect to an index, and association of the index with gender and person presuppositions that may require overt morphological realization in order to satisfy the Maximize Presupposition principle of Heim (1991).

tax might have semantic counterparts, the corresponding semantic object does not have to be identical to the syntactic object. Informally, we can understand the connection as an argument tracking device that ties the narrow-syntax representation to its semantic counterpart. The question then is how the formal connection between the PERSON feature and the index representation arises, and how the gender feature interacts with it.

Before we turn to the syntactic representation of the association, let us unwrap the interpretive part. Sauerland (2004) and Matushansky (2013) independently propose that valuation of context-dependent gender features is driven by the semantic component. The crucial insight is that semantic treatments of gender do not interpret gender directly, but instead they treat it as a *presupposition* associated with an assignment index (in simplified terms, as a pointer to the actual referent, or a referential address). Consider the previously cited example from Corbett (1991), given in (23).

(23)   The doctor said he/she could see me tomorrow.

The linguistic antecedent 'doctor' is compatible both with a female and a male referent. Yet, the pronoun used to refer back to the antecedent must respect the natural gender of the referent. The idea is that the form of the pronoun is determined by the index. The gender value of the pronoun restricts the interpretation of the antecedent: if the pronoun is masculine, the referent is masculine; if the pronoun is feminine, the referent is feminine. This intuitive correlation can be formally captured as an admissibility condition on the referent, that is, as a presupposition associated with the gender features. The corresponding semantic denotation of masculine and feminine gender is given in (24). The denotation of the features is defined as an identity function of type $<e, e>$. That is, the function takes an individual as its argument and returns an individual only if the individual is of the appropriate gender. If the individual is not of the appropriate gender, the function will remain undefined and the structure will not be interpretable.[47]

(24)   (modeled after Heim 2008)

    a. $[\![\text{GEN:f}_i]\!]^{w,g} = \lambda \mathrm{x}_e.$ $g(i)$ is female in w: x

    b. $[\![\text{GEN:m}_i]\!]^{w,g} = \lambda \mathrm{x}_e.$ $g(i)$ is a person in w: x

The semantic formula asserts that a feminine feature associated with index i will

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[47]The subscript i in the denotation of a gender feature is to indicate that the admissibility restriction arises only in the context of a semantic index.

denote a female person only if the referent associated with the index is indeed a female. For its masculine counterpart the formula asserts that such an index will denote a person only if the individual the index points to is indeed a person.

Since the interpretation function in (24) ultimately interprets an assignment index (i) associated with the gender, not the actual gender feature, it will return a semantic denotation corresponding to natural gender only if the PERSON feature is associated with a human or anthropomorphous referent at the CI. By definition, a gender feature is not semantically interpreted in and of itself.[48] Its interpretive effect lies solely in imposing interpretation restrictions on an index associated with the PERSON feature. Thus the dependency on humanness we observed in the Italian examples is a side-effect of licensing the PERSON feature by the semantic module (CI).

While the denotation specifies feminine grammatical gender as denoting a female, the masculine gender is in principle compatible with both natural genders. This is exactly what we find in Standard Italian. Thus, feminine *la chirurgo* 'the.F surgeon' must denote a female, whereas *il chirurgo* 'the.M surgeon' may denote a person of either gender. That the masculine form of such a noun is often interpreted as a male, despite the fact that the masculine feature presupposes a person instead of a male person, results from an implicated presupposition in the sense of Sauerland (2003, 2008). Consequently, if the implicated presupposition of maleness conflicts with the lexical semantics of the root, as, for instance, in *il soprano* 'the.M soprano,' the implicated presupposition does not arise and the grammatically masculine form freely refers to a female. Finally, since only gender features that presuppose a (female) person give rise to a natural gender interpretation, the proposed semantic system explains why the natural gender interpretation arises only for human and anthropomorphous referents.[49]

With a better understanding of the interpretive properties of the gender feature, we can now turn to the syntactic representation. Two major questions arise: (i) how is the association of the PERSON feature and the semantic index created?, (ii) how can the semantic component value a syntactic gender feature within a DP?

As for the association of PERSON and index, I follow the insight of Chomsky (2013, to appear) and argue that the association happens as part of labeling of a DP

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[48]Though it might obtain a natural gender interpretation indirectly from the lexical semantics of the root.

[49]If we instead associated the interpretability of the gender feature with one instance being a syntactic interpretable feature and the other instance being a syntactic uninterpretable feature (cf. for instance, Smith 2015), the connection to humanness would need to be stipulated. Here the connection follows from independently needed assumptions.

phase. According to Chomsky (2013, to appear), merge is a set-forming operation that in and of itself does not provide the newly created syntactic object with a label. Instead, labeling is a procedure triggered by the semantic interface.[50] In an endocentric structure, the closest head becomes the label.[51] In the nominal cases we investigate here, the label of a DP corresponds to the D head, more precisely, to the bundle of features that form the D head. I argue that since the labeling of such a DP is triggered by the semantic interface, it is in the process of labeling that a semantic index is added to the label as well.

We can now turn to the second question, that is, how can the CI association of the PERSON feature with an index value a gender feature within a DP, i.e., how can the CI information be relevant for syntax proper and determine the value of syntactic feature (gender).

As has been extensively argued in Distributed Morphology literature, morphological realization may, but does not have to, faithfully realize features present in the syntactic representation. Feature bundles may be *adjusted* at the interface and vocabulary insertion may be sensitive to the structural environment. Under this view, morphological gender marking can arise as the representation of the PERSON feature in a particular structural context. I argue that the context-dependent valuation of the gender features in the structure arises from such an adjustment. Specifically, I argue that the context-dependent valuation of gender features falls under a large family of morpho-syntactic phenomena governed by the Maximize Presupposition principle of Heim (1991). The principle asserts that if there is a presupposition associated with a structure and if this presupposition can be grammatically realized, it must be realized.[52] Since semantic gender features are presuppositional, gender feature-sensitive morphological insertion as *last resort* is governed by the Maximize Presupposition principle as well.

We can informally demonstrate on English pronouns how the Maximize Presupposition-driven morphological realization works. Consider again example (23), repeated below.

(23)   The doctor said he/she could see me tomorrow.

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[50]See Narita (2011), Chomsky (2013, to appear) for arguments, primarily from criterial freezing structures, that labeling is required by the semantic module.

[51]Technically, the head is identified by so-called minimal search. The actual label is formed by an identity merge of the features present in the head.

[52]The Maximize Presupposition principle has been argued to account for a variety of semantically sensitive morpho-syntactic phenomena, for instance, the distribution of definite articles (Heim 1991), number marking (Sauerland 2003, 2008), tense marking (Sauerland 2002) and scrambling (Kučerová 2012).

The analysis of pronouns proposed in Postal (1969) and Elbourne (2005) argues that pronouns are morphological realizations of DPs with an elided NP. If we model D as a bundle of unvalued ϕ-features, the pronominal morphological realization reflects values of the ϕ-features on D that got valued by Agree with valued ϕ-features of the complement NP. The problem is that unless we posit that English nouns are valued for grammatical gender and that there are two separate lexical entries for nouns like *doctor* – one grammatically feminine, one grammatically masculine – there is no valued gender feature on the NP. In turn, even if D came with an unvalued gender feature from the lexicon – which is far from obvious – there is no valued gender feature on the goal. For concreteness, I follow Ritter (1995) and much of subsequent work in that I model PERSON as a valued feature directly introduced on D. To avoid the non-trivial question of the exact PERSON feature geometry, I use descriptive label 3 for the relevant value ([−PARTICIPANT] as 3rd person). The syntactic structure we obtain for a pronoun referring to *doctor* is given in (25).

(25) $[_{DP} \text{ D}_{P:3,Num:\_} \; [_{NumP/NP} \; \text{doctor}_{Num:sg} \;]]$

At the point of morphological realization, the morphology module cannot assign the right pronominal form until it determines whether the PERSON feature corresponds to an animate referent. Observe that the feature bundle at the syntax output does not give any direct information about animacy. Whether or not the pronoun has an animate antecedent depends solely on the value assigned to the index. Vocabulary insertion thus reflects the CI association of the PERSON feature with an index.[53] If the index is animate, it becomes relevant whether the index corresponds to a female or male person.[54] The relevant assignment function deter-

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[53]We could also stipulate that in English the PERSON feature reflects animacy. As pointed out by an anonymous reviewer, English pronoun *it* could then be characterized as inanimate. An alternative is that *it* lacks a valued gender feature. Since a gender feature can be valued only in the presence of a person presupposition, we indirectly obtain the lack of animacy. I am not aware of any data that would distinguish between these two options for English. Since we would still need the gender-related step, adding animacy to the feature representation would not in and of itself solve the primary question of gender marking. The reviewer also raised a related question of the status of neuter in a three-way gender system. As far as I know, at least in Slavic, German and Romanian, neuter is either introduced by the nominal representation in the lexicon, or it arises in the presence of a person presupposition or in defective-goal structures such as agreement of weather predicates or marking of nominalized infinitives. Although one would need to investigate three-way systems more carefully, this preliminary overview suggests that the present proposal can be extended to these gender systems as well.

[54]For quantifiers, this amounts to saying whether the quantificational domain is restricted to

mines whether the value of the index corresponds to an animate (human) referent. If it does, then the morphological realization needs to comply with the Maximize Presupposition principle: vocabulary insertion realizes a feminine form if the referent is female and a masculine form if the referent is male or underspecified. A simplified derivation of *she*$_{doctor}$ is given in (26).

(26)   a.   syntactic output (after ϕ-feature matching and valuation):
$[_{DP} \text{D}_{P:3,Num:sg} [_{NumP/NP} \text{~~doctor~~}_{Num:sg}]]$

   b.   CI licensing and index association:
$[_{DP} \text{D}_{P:3,Num:sg,i:7} [_{NumP/NP} \text{~~doctor~~}_{Num:sg}]]$

   c.   Vocabulary insertion under an assignment function where $[7 \rightarrow \text{Mary}]$
$\text{D}[3, \text{SG},i]\backslash\_\Delta_{NP}$ where i is a female person $\Rightarrow$ /she/

While this account suffices for English, more needs to be said about Italian as in Italian a contextually valued gender feature may value an unvalued gender feature on agreeing elements, such as adjectival predicates. In Italian, unlike in English, D agrees in gender. It follows that D comes to the derivation with an unvalued gender feature. As for PERSON, the PERSON feature is introduced as a valued feature on D as in English. We can thus extend the hypothesis that PERSON is licensed and associated with i as part of semantically triggered labeling. Since a DP is an endocentric structure, the features of the D head will become the label of the DP.[55] In turn, the instantiation of the PERSON feature on the D head itself becomes licensed and the unvalued gender feature becomes part of the label as well.

As for the semantic valuation of the syntactically unvalued gender feature, I follow the logic of Preminger (2009) and argue that ϕ-features may in principle remain unvalued. Yet, they get reset to a – typically default – value as part of sending the syntactic output to the interfaces. I argue that if an unvalued gender feature co-occurs in the label with an animate PERSON feature associated with an index value, the gender feature gets reset to a feminine gender value if the feminine gender presupposition is satisfied. The proposed implementation thus captures the observation that gender features may be generated as 'free riders' on the PERSON feature (Harley and Ritter 2002, Béjar and Rezac 2003, Adger and

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animate individuals of which the relevant properties are true.

[55]Technically, a minimal search operation identifies features in the minimally accessible set-merge representation, and identity-merges them as the label.

Harbour 2007, among others).[56]

Let us turn to the rest of the derivation. Since features in the DP label are formally identical with their counterparts on D, the last resort valuation of the gender feature in the label automatically values the gender feature on D as well. Since the gender feature on D has already established a matching Agree link with the unvalued gender feature on n, both instantiations of the gender feature get automatically valued. The morphology component then realizes the DP with the valued gender features. The derivation for a noun like *la chirurga* 'the.F surgeon.F' is schematized in (27).[57]

(27)   *la chirurga* 'the.F surgeon.F'

    a.   Feature distribution from the lexicon & matching:
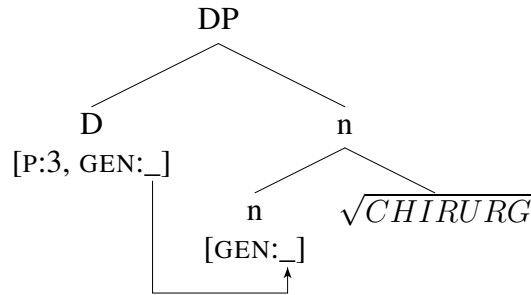
   b.   Labeling and CI licensing:
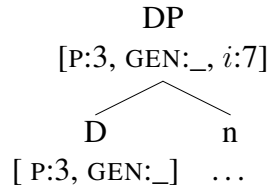
    c.   Maximize Presupposition-driven gender valuation:

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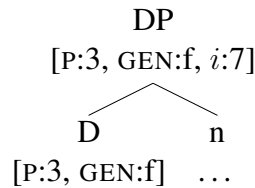
[56]A related idea has been expressed in the formal semantics literature as well. Most notably, Sudo (2012) models gender as part of indices associated with PERSON.

[57]Strictly speaking, there should be no DP label in the first step of the derivation. I keep the traditional label in for clarity.

d.   Automatic feature valuation and morphological output:
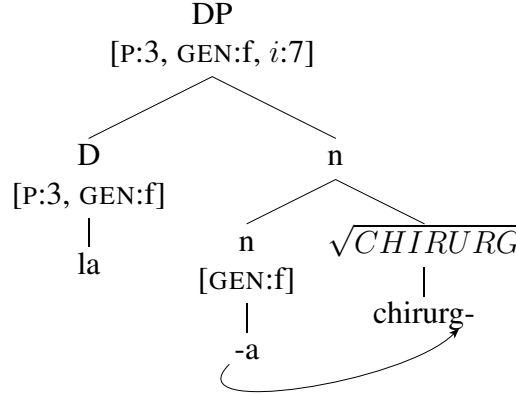
Since the contextually driven feature valuation is a last resort operation, it applies only if the gender feature is not valued in narrow syntax. If a gender feature is associated with a noun already from the lexicon, the gender feature on D obligatorily agrees with this lexically introduced value. Thus, the proposal captures the generalization that only a subset of nouns may have their value determined from the context. It also captures Matushansky (2013)'s intuition that semantic gender features are last resort.

Crucially, CI valuation of the gender feature within a DP is possible only if the feature has not been previously valued from the lexicon.[58] That is, the gender feature on D may be valued via the PERSON feature only if the gender feature on D is unvalued at the point of Transfer. Thus, the valuation takes place in the configuration in (21) but not in the configuration in (22). Consequently, only a gender feature projected in a DP structure based on a lexical nominal representation of the liberal type (28a) or the semi-conservative type (28b) may have a semantically interpretable gender feature. Which is to say, only the gender feature of mating nouns (e.g., *il chirurg-o* 'the.M surgeon.M' vs *la chirurg-a* 'the.F female surgeon.F') and semi-conservative nouns (i.e., nouns forms based on a class feature but with the agreeing elements in the structure determined by the natural gender of the referent, e.g., *il chirurg-o* 'the.M surgeon' vs *la chirurg-o* 'the.F female surgeon') is semantically interpretable.

(28)   *Lexicon representations of nouns compatible with natural gender*
      a.   Liberal (*il chirurgo, la chirurga*): $\sqrt{root}$

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[58]This follows from the timing of syntactic operations in (6).

b. Semi-conservative (*il chirurgo, la chirurgo*):

$$
\begin{array}{ccc}
 & & n \\
 & \diagup\diagdown & \\
n & & \sqrt{root} \\
[\text{CL}{:}1] & &
\end{array}
$$
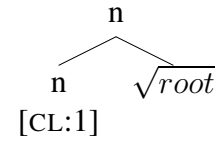
The consequence is that only a gender feature derived from a PERSON feature is semantically interpreted. Grammatical gender introduced in the lexicon is not.[59] No distinction between interpretable and uninterpretable syntactic features is needed to derive the interpretive distinction. Furthermore, the proposed implementation sheds light on the descriptive distinction between so-called animate and inanimate gender. Technically, animate gender is a gender feature which requires the co-occurrence of a PERSON feature with an animate referent. Inanimate gender lacks this co-occurrence requirement.

2.3 More on the role of timing: Spell-Out vs Transfer

A core property of the syntax-semantics system proposed in this paper is that there is a point in the derivation when the narrow syntax representation can interact with the semantic component. Namely, CI licensed values are accessible to narrow syntax only when a phase is completed. In this section I argue that while there is only one point in the derivation when syntax features can be valued by CI, there are *two* distinct points when the structure can be sent to morphology. The derivational distinction corresponds to the independently proposed distinction between the Spell-Out and the Transfer of a phase. I will utilize this distinction and argue that it plays a substantial role in the Italian gender system.

I model Spell-Out as the point in the derivation when narrow syntax operations are completed. By Transfer I mean the point in the derivation when a phase is sent to the CI interface.[60,61] Once the structure gets spelled-out, no new syntactic relations can be created. Here the independently proposed distinction be-

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[59]See also Bobaljik and Zocca (2011) for a related set of facts.

[60]I suspect the distinction between Spell-Out and Transfer underlies the disagreement in the literature whether the whole phase or only the phase head complement is spelled-out (for example, Chomsky 2001 vs Nissenbaum 2000). While syntax needs a local access to the edge of the phase (Phase Impenetrability Condition of Chomsky 2000), the semantics module can interpret only semantically complete units. Exploring this issue, however, goes beyond the scope of this paper.

[61]An anonymous reviewer raised an important question of how the proposed model relates to the notion of LF as in Heim and Kratzer (1998). Although this might turn out to be a vast simplification, there is no fundamental difference between LF and the model of CI used here. Under this view, Transfer maps the narrow-syntax structure onto a representation that may be further modified at CI/LF. For instance, some syncategorematic elements sensitive to the narrow-

tween matching and valuation as components of Agree becomes crucial. While the narrow syntax component cannot create a new matching link after Spell-Out, an existing matching link can get valued at the interfaces.[62] In the case we investigate here, it means that unvalued matched features can be valued by CI. After the feature gets valued and the structure is transferred, such a semantically enriched syntactic representation is realized by the morphology module. I argue that an economy condition that prefers the two interfaces to be isomorphic (be it the Maximize Presupposition principle of Heim 1991, or an economy condition of the sort proposed in Williams 2003, Reinhart 2006, Bobaljik and Wurmbrand 2012, Kučerová 2012, among others) may apply only during the temporal window between Spell-Out and Transfer. In turn, the realized morphological representation can reflect semantic features that were not originally present in the narrow syntax derivation only if the phase was sent to the morphology module at the point of Transfer, instead of Spell-Out. A model of the proposed grammar architecture is given in (29).

(29)   *Model of a derivation with Transfer preceding morphology:*

morphology   CI

$$\boxed{\text{Transfer} \sim \text{CI valuation}}$$

$$\boxed{\text{Spell-Out}}$$

Syntax

Lexicon
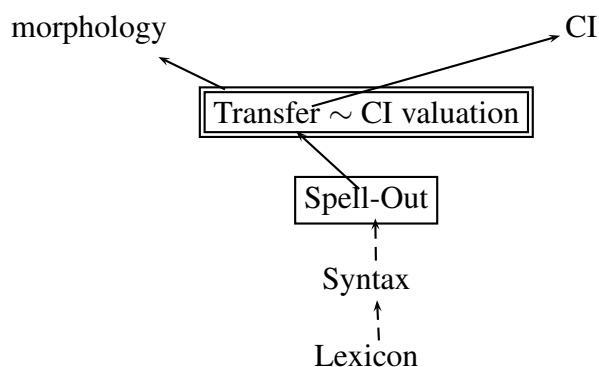
This derivational trajectory accounts for Italian nouns in which either the form of the noun itself or the agreeing elements within the extended DP morphologically reflect the natural gender of their referent, i.e., mating nouns, which I argue are based on liberal roots, such as *il bambino*, *la bambina* or *il chirurgo, la chirurga*, and semi-conservative nouns, which I argue come from the lexicon with a class

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syntax properties of their environment, such as a lambda-abstractor introduced for some instances of movement (A-bar movement but perhaps not all instances of A-movement) could be part of the Transfer procedure.

[62]This amounts to saying that narrow syntax requires unvalued features to be matched but not necessarily to be valued. See Preminger (2009) for empirical arguments in favor of this view.

marker but without a valued gender feature, such as *il chirurgo, la chirurgo*. In this type of structure, there is no valued gender within the DP in narrow syntax. The semantically informed value gets assigned when the DP phase is Transferred. Since morphology realizes the phase only after it undergoes Transfer, morphology faithfully reflects the semantically valued gender feature. We saw a detailed derivation of this type in (27).

The empirical question is whether a syntactic derivation could be sent to the morphology module *before* the phase is transferred and the features are valued by the CI interface. I argue that an Italian speaker's grammar indeed allows for both derivational options: the phase can be sent to morphology *before* it undergoes Transfer, or *after* it undergoes Transfer. If the phase is sent to morphology before it undergoes Transfer, the morphological realization of the DP cannot realize a semantically valued gender. The corresponding derivational trajectory is schematically given in (30).

(30)   *Model of a derivation with Transfer parallel to morphology:*
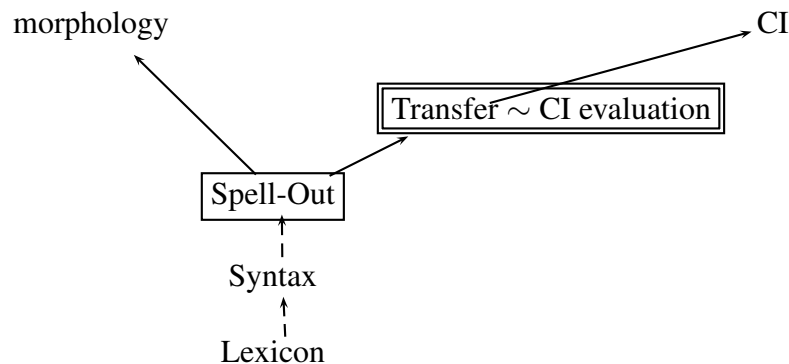
The empirical support for this timing distinction comes from the data discussed in section 1.3. We saw that lexically semi-conservative nouns exhibit two distinct agreement patterns. That is, if a noun like *soprano* comes from the lexicon with a class specification and if it denotes a female referent, the form of the noun is invariably *sopran-o* and it triggers feminine agreement on predicates. However, the elements *within* the DP agree either in feminine, as in (31a), or in masculine, as in (31b).

(31)   a.   la   soprano è andata
                 the.[F] soprano is gone.[F]

36

    b.   il   soprano è andata
        the.$\boxed{\text{M}}$ soprano is gone.$\boxed{\text{F}}$

The pattern when both DP-internal and DP-external elements agree in feminine corresponds to the derivation schematized in (29). Which is to say, if the DP-internal and DP-external agreement is identical, the narrow syntax representation of the DP has been enriched by CI before the DP has been sent to the morphology module. In other words, the morphological realization of the DP reflects the label of the DP

The surprising pattern is when the DP-internal elements appear as masculine, as in (31b). I argue that this agreement pattern arises only if the narrow syntax representation of the DP is sent to the morphology module immediately after Spell-Out, that is, before the phase is transferred and the DP labeled. Since the syntactic structure contains an unvalued ϕ-feature, morphology must resort to a default morphological realization, which in Italian corresponds to masculine.[63] In other words, if the internal agreement appears as masculine, we see an effect of *failed agree* in the sense of Preminger (2009). Crucially, the failed-Agree realization arises only within the morphology module. That is, the narrow syntax feature valuation remains unaltered.

However, for the DP to be selected for further syntactic derivation, i.e., to be merged with other syntactic material, the DP must first undergo Transfer and be labeled in the process. At this point, the unvalued gender feature can be valued by CI. Although this feature valuation is not morphologically reflected in the DP itself, as the structure has already been spelled-out, the CI valued feature is available for further Agree relations, such as Agree between the transferred DP and a predicate. The reason is that Agree targets features in the label, and the semantically valued gender is part of the label. Thus, the feminine agreement we see on the participle in (31b) is a morphological reflex of syntactic Agree between the unvalued gender feature on the participle and the valued gender feature in the label of the Transferred DP.

A crucial property of the proposed system is that a feature can get valued by CI only as a last resort. The proposal thus makes a clear prediction: If there is a valued feature present in the structure (introduced from the lexicon), the label of the DP cannot reflect a semantically enriched value of such a feature, and in turn no local Agree link can be valued by a semantically valued feature. This is precisely what happens with conservative nouns. For speakers who store *chirurgo*

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[63]See fn. 30 for evidence that masculine is the morphological default in Standard Italian.

in the lexicon with a class and masculine gender feature, the masculine gender feature values the unvalued gender on D and in turn becomes part of the DP label. Since the gender feature in the label is valued as masculine, all local Agree links are valued as masculine even if the intended label is a woman, as in (32a). The corresponding derivation is schematized in (33). In other words, once the label is set, the values cannot be altered. Only unvalued features in the label can be valued as last resort to comply with the Maximize Presupposition principle.

(32)   *Lexically given gender in the label overrides Maximize Presupposition:*

    a.   il   chirurgo è andato
        the.$\boxed{\text{M}}$ soprano is gone. $\boxed{\text{M}}$

(33)   *il chirurgo* 'the.M surgeon.M': conservative structure, denoting a female:
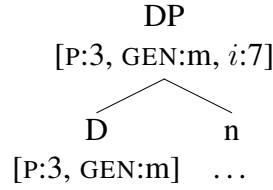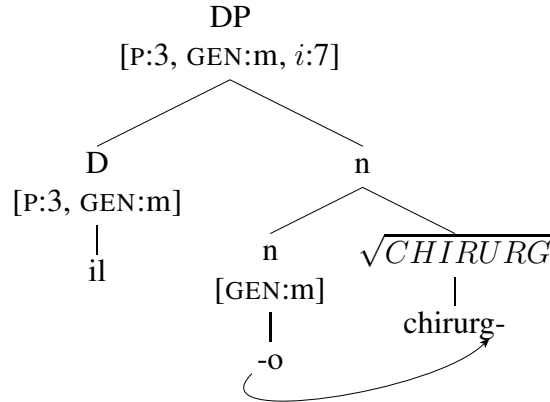
    a.   Feature distribution from the lexicon & matching:
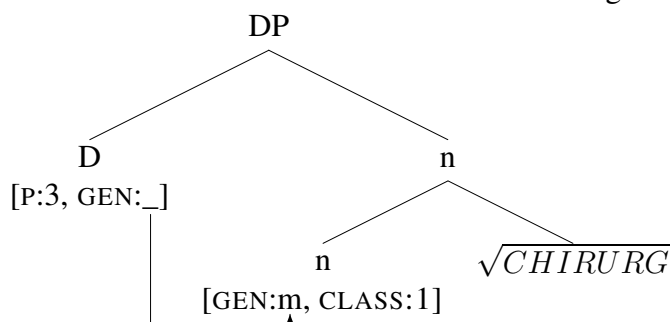
    (i)   Feature valuation from the structure:
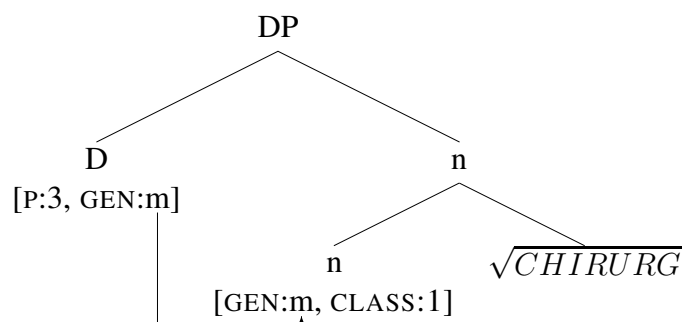
    (ii)   Labeling and CI licensing (where [7 → Mary]):

DP
[P:3, GEN:m, i:7]

D   n
[P:3, GEN:m] . . .

(iii) No effect of Maximize Presupposition & Morphological output:

DP
[P:3, GEN:m, i:7]

D   n
[P:3, GEN:m]

il   n $\sqrt{CHIRURG}$
            [GEN:m]
                         chirurg-
              -o

The proposal predicts that if a noun comes with a valued gender feature from the lexicon, any local agreement must respect the lexically given gender specification. Which is to say, if a noun comes from the lexicon with a valued gender feature that does not match the natural gender of the noun's referent, the natural gender may be reflected only in non-local agreement (for instance, across a sentence boundary) but never in a local agreement configuration, where by local I mean an Agree relation established in narrow syntax.[64] To explore this prediction, we need to look at grammatically feminine nouns in order to control for morphological default realizations.

Grammatically feminine nouns like *guida* 'guide' and *guardia* 'guard' obligatorily trigger feminine agreement on predicates, irrespective of the natural gender of their referent. Ferrari-Bridgers (2007) observes, however, that there is a striking exception to the pattern: if such a noun appears in a nominal conjunction, then it triggers context-dependent agreement. The switch is demonstrated in (34). While for Ferrari-Bridgers (2007) the data mean that this type of noun is underspecified

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[64]The predictions of the present model thus radically differ from models that assume the presence of a pronoun within D or of two distinct types of features, as in Collins and Postal (2012).

for gender, I argue that the pattern provides evidence for the grammar architecture proposed here. Since such a noun comes from the lexicon with valued gender, natural gender agreement is restricted only to non-local syntactic operations. As we can see, the participle in (34a) is valued by Agree with the DP labeled by the lexically specified gender. In other words, local agreement must reflect the lexically specified value. In contrast, if such a DP is embedded in a coordination, participle agreement with the coordination reflects the natural gender of the referents, as in (34b)–(34c).

(34)   a.   La brava guida   si   e'persa nel   bosco
             the good guide.[F] her/him lost.[F] in the woods
             'The guide lost his/her way in the forest.'
       b.   La guardia e   sua sorella sono andate   al   cinema sta
             the guard.[F] and self sister   have gone.[F.PL] to-the movies this
             sera
             evening
             'The guard and her sister went to the movies tonight.'
       c.   La guardia e   sua sorella son andati   al   cinema sta
             the guard.[F] and self sister   have gone.[M.PL] to-the movies this
             stera
             evening
             'The guard and his sister went to the movies tonight.'
                              [adapted from Ferrari-Bridgers (2007, 151, (4))]

I argue that the difference in the agreement pattern reflects distinct locality properties of the two agreement patterns, that is, the agreement with a coordinate is different in that Agree cannot directly access the DP in question. Instead, the participle probes the label of the coordination. Since conjunction forms a plurality (Munn 1993, Bošković 2009, Bhatt and Walkow 2013), which is a process that requires access to the semantic component, the compounded gender value of the two conjuncts is based on the value provided by CI, instead of being determined by the lexicon. In turn, the natural gender value is accessible to agreement only if Agree targets a semantically specified label, instead of the ϕ-features present in the label of the DP.[65]

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[65]An anonymous reviewer raised the question of whether coordination could be derived by a morpho-syntactic mechanism, instead of referring to semantic plurality. I am not aware of a proposal that would successfully account for the difference between 'a good friend and his editor was/were...' without using some semantic component. Thus, I follow proposals that argue for some combination of semantic and morpho-syntactic valuation (Farkaş and Zec 1995, King and

Another prediction concerns a cross-linguistic variation. The current proposal assumes that masculine within a DP behaves as semantically unmarked because the masculine morphology arises via failed Agree, that is, there is no valued syntactic feature that would be interpreted by semantics. If a language resorted to feminine as its default failed-Agree value, we would expect that feminine would be associated with a wider variety of semantic interpretation. A cross-linguistic investigation of this prediction goes beyond the scope of this paper, but some Arabic dialects, for instance, might be good candidates for testing this prediction.

2.4   Further extensions

Although the proposed grammar architecture model was specifically developed for Italian nominal inflection, if it is on the right track, it should extend to other empirical domains as well. In general, the model predicts that the grammatical and the semantic values of ϕ-features are not necessarily established at the same time within the course of the derivation, and consequently, derivational-timing differences correspond to interpretive differences. We thus expect to find a parallel derivational effect in other languages and with other features. I briefly discuss three sets of data that provide suggestive evidence for the proposed model.

We have known since the foundational work of Picallo (1991) and Ritter (1993) that the domain of gender valuation varies. As Ritter (1993) observed, nominal derivational morphology in Hebrew does not preserve the gender of the root noun. However, the gender of a Hebrew noun cannot switch because of the natural gender of its referent. The opposite is true of Spanish (Harris 1991). As we have seen in this paper, neither of these two facts is surprising. Natural gender-dependent switching (mating nouns) is possible only if a noun comes from the lexicon without a lexically valued gender feature.[66] While this is occasionally possible in Romance languages, Hebrew does not seem to have this option. In contrast, the fact that the lexically specified gender does not percolate through Hebrew derivational nominal morphology is not surprising. Recall our discussion of Italian V-N compounds in Section 1.4. As we saw there, if the derivational D[67] cannot access the lexically given gender feature on the root (for reasons of locality), the overall gender is fully determined by the outer derivational morphol-

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Dalrymple 2004, Heycock and Zamparelli 2005, among others).

[66]That nouns may differ in whether or not their gender feature is lexically specified has been independently argued by Alexiadou (2004) for Romance, Greek, and Hebrew, and Riente (2003) for Italian.

[67]I call the D head derivational as technically these are nominalized structures.

ogy.[68] Similarly, if the form of the root noun is in principle independent of the lexically determined gender feature value, it is not surprising that in languages like Hebrew, a word that has the phonotactic shape of masculine nouns can still trigger feminine agreement as can be seen in (35).

(35) a. šana   tova
          year.F.SG good.F.SG.
          *šana   tov
          year.F.SG good.M.SG.
      b. šan-im   tovot
          year.F.PL good.F.PL.
          *šan-im   tov-im
          year.F.PL good.M.PL.

<div align="right">Ritter (1993, ex. 8, p. 799)</div>

Another related data set comes from German. As observed by Yatsushiro and Sauerland (2006), there are instances of morphologically marked gender features that may but do not have to be compositionally interpreted.[69] They demonstrate this point on the German derivational morpheme *-in* that forms profession nouns for females. The critical distinction can be observed in a superlative DP, as in (36).

(36) Merkel jetzt beliebteste   Politiker-in   Deutschlands.
      Merkel now most-popular politician-FEM of-Germany
      (i) 'Merkel now most popular female politician in Germany.' [= true even if there is a male politician more popular than Merkel]
      (ii) 'Merkel now most popular politician in Germany.' [= false if there is a male politician more popular than Merkel]

<div align="right">(Yatsushiro and Sauerland 2006, 11, (2))</div>

If the profession noun *Politiker* combines with the feminine ending *-in*, the superlative meaning of the complex DP can be either calculated with respect to

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[68]Languages differ in how nominal derivational morphology treats gender. Languages such as German resemble Hebrew in that the gender of a diminutive is solely determined by the derivational morphology (diminutives are always neuter for German). However, in other languages, such as Russian, the gender of the diminutive tends to retain the lexically determined value of the nominal root. See, for example, Wiltschko and Steriopolo (2007) and Matushansky (2015).

[69]For an early and comprehensive argument that morphological features corresponding to functional categories do not always compose compositionally, see Carlson (1983) .

female politicians only (then *-in* is semantically active and the superlative morpheme scopes over it), or it may refer to politicians of both genders (then *-in* is not semantically interpreted; instead it is a pure 'agreement' reflex of the natural gender associated with the individual Merkel that can be modeled as being in the scope of the superlative morpheme). A theory that associates interpretability of gender features with a distinct height of functional heads would either have to postulate two distinct derivational morphemes, or the morpheme would need to have two distinct functional projections for gender. Neither option seems well motivated. The problem is simpler in the present account and can be straightforwardly tied to the Spell-Out/Transfer timing distinction. When the morpheme *-in* gets morphologically realized before CI can associate the gender feature with a semantic index corresponding to a feminine referent and in turn activate the gender presupposition that would enforce the female interpretation, then we obtain reading (i). When the feature bundle is sent to morphology after the semantic index is added, then we obtain reading (ii).

An analogical distinction in the derivational timing can be shown for number features as well. In some British dialects, group nouns like *team* may trigger both singular and plural agreement. The seeming optionality disappears in certain contexts: if such a noun is an indefinite, the agreement pattern restricts the scope of the indefinite. Consider (37).

(37)   A northern team is/are certain to be in the final.

        a.   is: $\exists > certain$, $certain > \exists$

        b.   are: $\exists > certain$, $* \ certain > \exists$

<div align="right">(Sauerland and Elbourne 2002, 288, (14))</div>

While the singular agreement is compatible with two distinct LF interpretations, the plural agreement forces a wide scope of the indefinite.[70] Unless we posit a look-ahead derivation, this correlation between agreement and a particular LF representation strongly suggests that the grammatically based singular agreement is established *before* the corresponding LF is determined. In contrast, the semantically informed plural agreement strictly refers to a point in the derivation *after* the potential scope ambiguity has been resolved.[71] Theories that attribute differ-

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[70]Which is to say, for the plural agreement proposition to be true, there must a particular team that is certain to be in the final. In contrast, for the singular agreement proposition to be true, there may be either a particular team from the north or only teams from the north (in which case, a northern team is certain to be in the final).

[71]The present account is very different from that offered in Sauerland and Elbourne (2002). I

ences in grammatical and semantic features to distinct functional heads within an extended DP have little to say about this difference in derivational timing. In contrast, the theory proposed here has a straightforward answer for the observed asymmetry. If the singular, that is, grammatical agreement is established before Transfer, it does not reflect the semantic interpretation. In contrast, if the plural agreement gets established only as part of Transfer, it is reflective of the semantic representation.[72] This of course does not account for all the properties of the pattern, that is, why only wide scope triggers the semantic agreement and why semantic agreement arises at all if there is a valued grammatical feature in the structure. The overall pattern, however, is compatible with the model of ϕ-feature valuation introduced in this paper.

3   Conclusions

This paper provides an explicit model of Italian nominal inflection in the full course of its derivation, starting with its lexicon representation, followed by its narrow syntax derivation, and its realization in the morphology and semantic interfaces. Extensions of the proposed model, however, go beyond Italian, especially the proposed model of ϕ-features at the syntax-semantics interface.

This paper makes two major theoretical contributions. The first contribution concerns lexical representation of nominal structures and contributes to our current understanding of root representations in the lexicon and the distinction between interpretable and uninterpretable features. The paper provides evidence that nouns can come from the lexicon with or without a valued gender feature. An unvalued gender feature may get valued by CI when the DP is sent to the syntax-semantics interface. The logic of the proposal is that a lexically determined gender feature is never semantically interpreted, a fact that often gets masked by the lexi-

do not follow their analysis because it incorrectly predicts that grammatically plural nouns that denote singular objects, such as pluralia tantum, should optionally trigger a singular agreement. As far as I can tell, the symmetry problem is inherent to their account and cannot be fixed without additional stipulations.

[72]As pointed out by an anonymous reviewer, this conclusion runs against the observation that plural marking in English corresponds to an interpretive default for number (Sauerland 2003, Sauerland et al. 2005). Yet, if the number value is contextually provided, the value must match the semantic value (in the sense of plural as mereological or Boolean conjunction). I don't have a conclusive answer as to when plural marking corresponds to a semantic default. If, however, the analysis proposed in this paper for the interpretation of gender is on the right track, an association of the syntactic number feature and a semantic index could be a key element.

cal semantics of the corresponding root. A gender feature is interpreted only if it is valued from the syntax-semantics component. That is, the distinction between interpretable and uninterpretable features is reduced to independently needed properties of the assumed grammar architecture. Second, the paper proposes a theory of ϕ-features at the syntax-semantics interface that strictly relies on the Minimalist Program grammar architecture. The proposed model provides evidence that there are two distinct routes for a syntactic representation to be sent to morphology: either the narrow syntax representation is sent to morphology at the point of Spell-Out and then the morphological realization reflects the narrow syntax feature configuration, or it can be sent to morphology at Transfer, that is, with the syntactic representation enriched by semantic information. The latter route ties the Italian data patterns to data that have been independently argued to involve a derivational asymmetry where the morphological realization is sensitive to the semantic representation (Williams 2003, Reinhart 2006, Bobaljik and Wurmbrand 2012, Kučerová 2012, among others).

A core property of the syntactic implementation is that although the gender feature may differ in the locus of its valuation, grammatically, both types of gender feature – grammatical and natural gender – are realized within the same Agree chain. This property, combined with the two possible derivational routes, lends itself to account for several persuasive properties of the grammatical vs semantic feature distinction that remain unaccounted for in the literature to date. First, if there are independent instances of gender feature valuation – a proposal spelled out most precisely in Kramer (2009, 2015) – we would expect to find gender stacking, analogical to number and case stacking (Hagit Borer, p.c.). This prediction is not borne out in the current analysis, suggesting it is incorrect. Indeed, I am not aware of any language that has such a property. Even though there may be more than one source of gender feature valuation, there is only one Agree chain within an extended DP. Thus, this structural property accounts for the lack of gender stacking.

In addition to providing a theoretical motivation for distinguishing between syntactic valuation and contextual valuation as a direct consequence of the phase-based grammar architecture, the paper makes two further theoretical contributions. The first is that only a subset of nouns are based on category-neutral roots (cf. Marantz 1997), a conclusion supported by data from derivational morphology and compounding. Second, the proposal sheds greater light on the cross-linguistically persuasive generalization that animate 3rd person nominals share feature properties with 1st and 2nd person (Ormazabal and Romero 1998, 2007, Adger and Harbour 2007, Ritter 2014, Wiltschko and Ritter 2015, Welch 2014,

Lochbihler and Oxford 2015, among others). This follows under the hypothesis that animate nouns share the [+participant] feature with the 1st and 2nd person nominals, and in turn are licensed by CI in the same manner as them. Since 3rd person inanimate nominals have different person feature valuation, they may be treated differently at the CI interface.

Finally, the paper opens the door to rethinking a cross-linguistically prevalent dependency of gender on number. If semantically interpretable gender is indeed dependent on PERSON and there is a connection between semantic individuation and PERSON, there might be no direct dependency between gender and number (cf. Greenberg 1963, Noyer 1992, Harley and Ritter 2002, among others). To fully explore this hypothesis, however, goes beyond the scope of this paper.

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