The Location of Gender Features in the Syntax

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Abstract: The goal of this paper is to critically review the results of linguistic research on the syntactic location of gender features. It has become relatively clear that gender features do not project their own phrase "GenP" and they are not located on the Num(ber) head that hosts number features. Instead, the field mostly agrees that gender features are located on the nominal -- either on N or, in approaches that decompose lexical categories, on the nominalizing head *n*. Additional gender features have been proposed higher in the structure in order to capture certain processes that impose their own gender (e.g., diminutives are always feminine in the Semitic language Amharic) and to capture patterns of hybrid agreement (e.g., Russian nouns that are grammatically masculine but may trigger feminine agreement when referring to a woman).

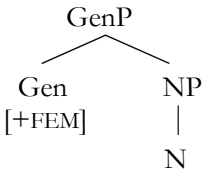
1 Introduction

The syntactic literature on gender is extensive; considerable progress has been made on the syntactic locus of gender, the identity of gender features, and the mechanics of gender agreement. This paper critically reviews the results of this work for the location of gender features in the syntactic structure. I assume gender features are in the syntax because they participate in agreement relations and, following Chomsky 2000, 2001, I assume that agreement relations are established during the syntactic derivation (see also Pfau 2009:106-127 for additional evidence from speech errors for gender being in the syntactic derivation). In Section 2, I show how gender features do not project their own phrase "GenP." In Section 3, I discuss how gender features are almost always proposed to be located on the nominal, either on N or, in approaches that decompose lexical categories, on the nominalizing head *n*. In Section 4, I review the evidence for additional projections hosting gender in the syntax. Section 5 concludes.

2 There is no GenderP

Gender features have occasionally been claimed to be the head of their own phrase, namely, Gen(der)P (Picallo 1991, Koopman 2003ab, De Belder and van Koppen 2015). GenP has been proposed to be immediately on top of NP, presumably because gender morphology is usually closest to the noun. For example, in the English noun *actr-ess-es,* the feminine suffix *–ess* is closer to the noun than the plural suffix *-es*. It is widely assumed that the order of morphemes reflects the order of syntactic projections (Baker's 1985 Mirror Principle); so, since gender is before number in *actr-ess-es,* a gender projection must be below a number projection and immediately above the noun. (1) is a schematic representation of GenP for a feminine noun.

(1)



Some decisive arguments have been advanced against GenP in Ritter 1993, di Domenico 1997, Alexiadou 2004, Alexiadou, Haegeman, and Stavrou 2007:239-246, and Kramer 2015: Ch. 2, among others. In this section, I assemble these arguments and go through the evidence. Crucially, I do not address proposals where GenP is the location of a gender agreement/concord marker (as in, e.g., Shlonsky 1989, Coopmans 1994, Mallen 1997, Laenzlinger 2005). This paper is only concerned with gender features that are involved in gender assignment, not in gender agreement.[1]

For some GenP proposals (Koopman 2003ab, De Belder and van Koppen 2015), it does not make a substantive difference whether gender features are located in GenP or in NP; they use GenP merely as a convenient location for gender features. In contrast, Picallo 1991 explicitly argues in favor of GenP, but the evidence is not wholly convincing (Ritter 1993, Alexiadou 2004, Alexiadou, Haegeman, and Stavrou 2007, Kramer 2015). For example, Picallo 1991 observes that Catalan nouns are inflected for gender and number, as in (2).

(2) a. el gos-∅ b. els goss-o-s

the.M dog-M the.MPL dog-M-PL

c. la goss-a d. les goss-e-s

the.F dog-F the.FPL dog-F-PL (Picallo 1991:280; glossing by RK)

Picallo assumes that inflectional elements head their own projections; therefore, since gender is expressed as inflection in Catalan, there must be a GenP.

However, following influential work by Harris (1991), Alexiadou (2004:24) points out that the "gender inflection" in Romance languages – the post-stem vowels (and lack of vowel) in (2) --- actually expresses inflection class. Harris 1991 showed that, in Spanish, post-stem vowels are found on adverbs (even though adverbs lack gender) and the choice of vowel does not correlate well with gender (e.g., nouns can have the "feminine" final vowel and trigger masculine agreement and vice versa, some final vowels occur with both genders, etc.). Therefore, the vocalic endings on Romance nouns are not gender markers, and this piece of evidence for projecting a GenP loses its force.

Picallo (1991) also claims that the specifier of GenP is the location of certain nominal arguments. For example, in (3), she proposes that *d'en Pere* 'of Pere' is in Spec,GenP and *de Nabokov* 'of Nabokov' is in Spec,NP (the noun undergoes head movement to Num; lower copies are struck through).

(3) [$_{DP}$ las [$_{NumP}$ novelles [$_{GenP}$ d'en Pere ~~novelles~~ [$_{NP}$ de Nabokov ~~novelles~~]

the novels of Pere of Nabokov (Picallo 1991:283)

However, *de Nabokov* 'of Nabokov' could be a complement to the noun (depending on the correlation between syntactic position and thematic roles), in which case *d'en Pere* could be in Spec,NP (Kramer 2015:24-25). Moreover, even if *de Nabokov* is a specifier, there is no evidence in favor of *d'en Pere* being in the specifier of GenP in particular; it could be hosted by any functional phrase (e.g., perhaps a Poss(essor)P). Overall, then, there has been no strong empirical evidence advanced in the literature in favor of GenP.

In general, a syntactic projection is well-motivated if (i) it is associated with multiple syntactic effects (a feature in its head participates in agreement, its head serves as a landing site for head movement, etc.), and (ii) there is evidence for it at the semantic interface and at the morphophonological interface (Chomsky 1995:355), i.e., it has an effect on interpretation and on pronunciation. For example, there is evidence for a number projection Num(ber)P because number features participate in agreement and Num is a landing site

for N movement (see e.g., Ritter 1991 on Hebrew, Valois 1991:53 on French). Moreover, number features have consistent semantic effects (they cause a noun to be interpreted as singular or plural), and most languages distinguish singular and plural morphologically (Dryer 2013).

GenderP is not very well-motivated according to these criteria. It has only a single clear syntactic effect: agreement. In many of the familiar gender systems, gender only intermittently affects interpretation and only indirectly affects morphophonology. For example, in Spanish, the noun *artista* 'artist' is interpreted as female-referring if feminine and male-referring (or sex-unspecified) if masculine. However, the word *verdad* 'truth' is also feminine, and the feminine-ness is not interpreted semantically since the concept 'truth' cannot be biologically female. Gender is also not consistently expressed morphophonologically on nouns in Spanish (Harris 1991), except for a few derivational suffixes (e.g., *actor*/*actr-iz* 'actor/actress'). Therefore, there is little evidence for GenP in Spanish.

On the other hand, in certain languages, gender can be regularly interpretable or pronounceable. For example, in Tamil, feminine nouns refer to human females, masculine nouns refer to human males, and neuter nouns refer to anything else – with few to no exceptions (Arden 1942, Asher 1985). Gender therefore has a consistent interpretation associated with biological sex and human-ness. In Modern Hebrew, feminine gender is associated with a particular morphophonological signature – specifically, almost all feminine nouns have a suffix that marks feminine gender (Faust 2013). However, importantly, there is no single language where gender is consistently interpretable and consistently pronounced. This is in stark contrast to, say, the consistent marking and interpretation of plural nouns across languages.

Overall, then, there is little compelling evidence for GenP – either in the previous literature or by thinking through the criteria for projection in the syntax.[2] To be sure, a better case can be made for GenP in a language like Tamil than can be made in a language like Spanish. However, if languages like Tamil and Hebrew can be explained without a GenP, and GenP is unmotivated for languages like Spanish, it is simpler to claim that GenP does not exist at all (cf. argumentation in Chomsky 1995:349-355 for the elimination of Agr nodes). This is what I proceed to do in the next section.

3 Gender on the Noun

If gender does not project its own phrase, but is still present in the syntax, it must be that some other head hosts the gender features. In this section, I first show how there is little evidence that the Num(ber) head hosts gender (Section 3.1), and then discuss how the majority of the field agrees that gender is located on the noun head itself (Section 3.2).

3.1 Gender is not on Num

Gender features have sometimes been proposed to be syntactically located on Num, as in Ritter 1993 for Romance languages, and Giurgea 2008 and Croitor and Giurgea 2009 (in part) for Romanian. However, in my previous work (Kramer (2015: Ch.8)), I have argued that the evidence for gender features being on Num is not compelling. For example, Ritter (1993) notes that, in some languages, gender and number are exponed simultaneously with a portmanteau morpheme. One case-in-point is Italian where *–i* expresses masculine plural and *–e* feminine plural ((4)).

(4) a. ragazz-i b. ragazz-e
young.person-MPL young.person-FPL
'boys' 'girls' (Alexiadou 2004:34)

Thus, it seems plausible that gender and number are part of the same syntactic head. However, under standard assumptions about the structure of the nominal phrase, the number projection is immediately above the noun phrase (Alexiadou, Haegeman, and Stavrou 2007:234; see (8) below). Therefore, if gender features are on the nominal head, then gender and number are structurally local enough to become a portmanteau, e.g., by undergoing the Distributed Morphology operation Fusion which combines two syntactic heads into one morphological node (see e.g., Halle 1997, Kandybowicz 1997). Additionally, if gender is on N/*n*, gender is local enough to allomorphically condition number; this means that a single morpheme whose form seems to vary based on gender and number may in fact be a Num head whose allomorphy is determined by the nearby gender feature (for an example of this type of analysis, see Carstens 1991 on noun class in Swahili). So, morphemes that express gender and number at the same time do not necessarily indicate that gender features are on Num.

The other major piece of evidence for gender being on Num is that, in some languages, changing the number of a noun also changes its gender. For example, in Romanian, "neuter" nouns trigger masculine agreement in the singular and feminine agreement in the plural, as shown in (7).

(5)	a. o femeie	b. două femei	**Feminine**
	a.FS woman	two.FPL woman.FPL	
	'a woman'	'two women'	
(6)	a. un bărbat	b. doi bărbaţi	**Masculine**
	a.MS man	two.MPL man.MPL	
	'a man'	'two men'	
(7)	a. un glas	b. două glas-uri	**Neuter**
	a.MS voice	two.FPL voice-PL	
	'a voice'	'two voices'	(Maurice 2001:231)

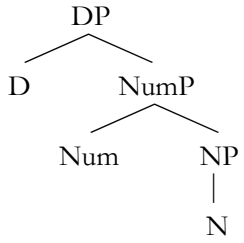
However, building on Farkas 1990, I proposed in my previous work (Kramer 2015:Ch.8) that neuter nouns have no gender features, and receive masculine gender by default in the singular and feminine by default in the plural (see also Kramer 2015:148-166 and Acquaviva 2008:Ch.5 for similar analyses of gender-switching facts in other languages). For the Romanian data, Num-based-gender proposals also struggle to explain gender agreement with coordinated subjects, make incorrect predictions, and fail to characterize neuter nouns properly (Giurgea 2014, Kramer 2015:179-180). Overall, then, there is scant evidence that gender features are only on Num.[3,4]

3.2 Gender on the Nominal

3.2.1 The Structure of the Analyses

In generative syntax, the standard minimum structure for a nominal phrase is in (8).

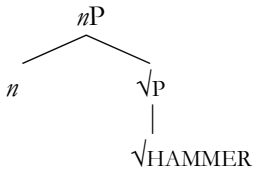
(8)



The majority of the gender literature agrees that gender features are located on the N head, at the very bottom of the tree. However, this idea comes in two forms, depending on the structure of lexical categories.

Traditionally, a noun has a syntactic representation like the bottom of (8): the N head of NP. Accordingly, many analyses of gender have argued that gender features are on N, forming part of the idiosyncratic information in the lexical entry of a noun (see e.g., Roca 1989, Harris 1991, Ralli 2002, Riente 2003, Alexiadou 2004, Carstens 2000:328, 2010, 2011, and, in another framework, Wechsler and Zlatić 2003). However, a prominent alternative theory is that each lexical category is decomposed into two parts: a category-neutral root (represented with a square-root sign and small caps) and a category-defining head that turns the root into a full-fledged lexical category ((i.e., a nominalizer, verbalizer or adjectivalizer). The category-defining heads are most often represented in lower-case italics and referred to as "little n, "little v," etc. A representation of the English noun *hammer* in this approach is in (9) (note that it is controversial whether or not roots project phrases; see e.g., Harley 2014). The verb 'to hammer' would be formed by adding a *v* to the root √HAMMER.

(9)



This type of analysis is known as lexical decomposition since it decomposes lexical categories into a root and a categorizing head. Lexical decomposition is often associated with Distributed Morphology (see e.g., Marantz 1997, 2001, Arad 2003, 2005, among many others), but it is by no means limited to this framework (see e.g., Borer 2005, 2013, Fathi and Lowenstamm 2016).

With respect to gender, the lexical decomposition literature agrees that syntactic gender features are not located solely on the root. Roots are most often assumed to lack grammatical features like gender altogether (Borer 2005, 2013:264, Acquaviva 2009) and putting nominal gender features on a root also severely undermines the idea that roots are category-neutral (Acquaviva 2009). Moreover, nouns like *artista* 'artist' in Spanish can be interpreted as referring to a male artist or a female artist, and nouns like this would

be forced to have two synonymous, homophonous roots with different gender features -- a non-optimal state of affairs given how common these nouns are across and within languages (Kramer 2015:32-33).

Instead, lexical decomposition approaches almost all claim that gender is located on or around the category-defining head *n* (see e.g., Ferrari 2005, Kihm 2005, Lecarme 2002, Lowenstamm 2008, Acquaviva 2008, 2009, Kramer 2009, 2014, 2015, Percus 2011, King 2015, Deal 2016, Fathi and Lowenstamm 2016).[5] Evidence for this is that gender plays a role in other phenomena associated with *n* like nominalization (see Section 4.2) and inflection/declension class (which, in Distributed Morphology, is inserted post-syntactically at *n* and conditioned by gender). Moreover, in some of my previous work (Kramer 2009, 2012, 2016), I show that irregular plurals in Amharic are formed by *n* and accordingly, irregular plural morphology and gender morphology cannot co-occur. In a *n* approach to gender, it is commonly claimed that a two-gender masculine/feminine system has a feminine *n* (*n*[+FEM]) and a masculine *n* (*n*[-FEM]). Licensing conditions match up the right root with the right *n* (Acquaviva 2009, Kramer 2015:Ch.3).

Henceforth, I refer to the analysis with gender on N as the N-analysis and the lexical decomposition approach as the *n*-analysis. Both analyses successfully capture many of the key facts about gender. For example, both analyses explain why gender morphemes are immediately next to the nominal/root since they are on N in the N-analysis and on the projection immediately above the root in the *n*-analysis. Both analyses can also capture the morphophonological effects of gender. Recall from Section 2 that feminine nouns in Hebrew generally have a suffix that marks feminine gender. In the N-analysis, feminine nouns have feminine gender as part of their lexical entry, and either the feminine gender feature is realized as a suffix with a lexical rule or it is realized as a suffix post-syntactically. In the *n*-analysis, there is already a separate 'piece,' so to speak, for the feminine gender suffix; roots for nouns with feminine gender are licensed under *n*[+FEM], and the *n*[+FEM] can then be realized as the feminine suffix in the post-syntactic morphology.

Both analyses also capture the complex semantics of gender; I mostly use Spanish to demonstrate henceforth. Every gender system displays a correlation between biological sex and/or animacy with one or more genders (Aksenov 1984, Corbett 1991, Dahl 2000, Kramer 2015).[6] The correlation of biological sex/human-ness with gender is exceptionless in Tamil (see Section 2), but even in Spanish, almost all female-

referring nouns are feminine and male-referring nouns are masculine. To account for this, most N-analyses rely on lexical rules to relate a semantic property to a gender. For example, Harris (1991:51) proposes that all lexical entries containing the specification 'female biological sex' in Spanish (e.g., the entry for *madre* 'mother') are assigned feminine gender by a lexical rule.

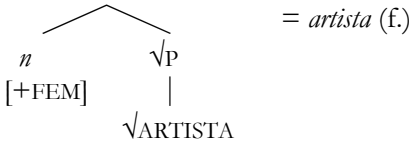
Since *n*-analyses are most often conducted in Distributed Morphology, and Distributed Morphology lacks a generative lexicon, they cannot usually appeal to lexical rules to connect sex and gender. Instead, *n*-analyses have often proposed that the gender features on or around *n* can be interpretable (Kramer 2009, 2014, 2015, Percus 2011). This has the effect that, say, when the root √MADRE 'mother' appears with a *n*[+FEM], the resulting nominal is interpreted as female (I include Spanish word markers/epenthetic vowels like *–e* in *madre* as part of the root but only for clarity; see Harris 1991). The presence of the [+FEM] feature ensures that the nominal will trigger feminine agreement.

In Spanish (like in many languages), inanimate-referring nouns also have gender, despite their lack of biological sex. As mentioned in Section 2, the noun *verdad* 'truth' is feminine but does not have a biologically female referent. Both the N-analysis and the *n*-analysis can cover these facts, too. In the N-analysis, inanimate nouns simply have their gender listed in their lexical entries; this prevents any rule that assigns gender based on semantics from applying. In the *n*-analyses found in my previous work (Kramer 2014, 2015) and in Percus 2011, these nouns are accounted for by building on the fact that syntactic features vary in their semantic interpretability (see e.g., Chomsky 2000). Specifically, each gender (masculine, feminine) has an interpretable and an uninterpretable version of its feature (e.g., interpretable and uninterpretable [+FEM]). Roots that are part of a nominal interpreted as animate (most often) combine with a *n* with an interpretable gender feature, like √MADRE 'MOTHER' does. But roots that are part of a nominal interpreted as **in**animate combine with a *n* with an **un**interpretable feature. These inanimate nominals will thus not be interpreted as being, say, "female" but they will trigger the same agreement as any other *n*P with, say, a [+FEM] feature.[7]

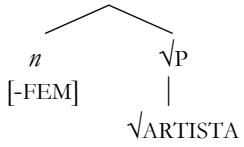
In Spanish and many other languages, a handful of animate nouns have the same gender no matter who they refer to, e.g., *persona* 'person' is always feminine. Both analyses can treat these nouns in the same way as inanimates. The N-analysis assumes that the gender of *persona* is listed as "feminine" in its lexical entry

(Harris 1991), and the *n*-analysis can assume that the root √PERSONA only combines with a *n*[+FEM] that is uninterpretable (Kramer 2015: Ch.6, Percus 2011).

Finally, many languages have nouns that can be either masculine or feminine depending on the biological sex of the referent, e.g., Spanish *artista* 'artist' (on these nouns generally, see Corbett 1991:181-2, Wechsler and Zlatić 2003, Alexiadou 2004). I refer to these nouns as "variable-gender" nouns. In my previous work (Kramer 2009, 2014, 2015), they are accounted for by having, say, the root √ARTISTA licensed under either *n*[+FEM] or *n*[-FEM], both with interpretable gender features.[8]

(10) a. 

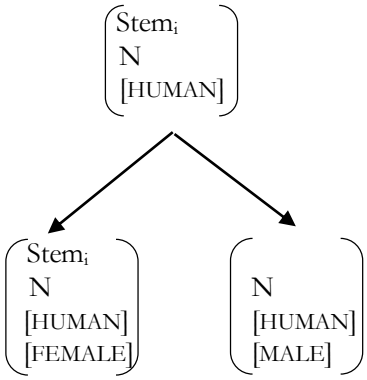
= *artista* (f.)

b. 

= *artista* (m.)

In the N-analysis, the account of variable-gender nouns is slightly more complicated. For example, Harris (1991) assumes that the generative lexicon of Spanish contains a Human Cloning Rule, shown in (11).

(11) **Human Cloning Rule** (Harris 1991:51)



For example, the lexical entry of the noun *artista* contains the stem *artista*, the category information that it is a noun, and the specification 'human' --- but it does not specify sex. Therefore, the stem undergoes Human Cloning and then there are two lexical entries: one male *artista* and one female *artista.* In Harris's (1991) system, the male *artista* will be assigned masculine gender by default, and the female *artista* will be assigned feminine gender by the rule referred to above that assigns feminine to any lexical entry with the specification 'female' (Harris 1991:51). So, the N-analysis captures variable-gender nouns through the addition of lexical rules like (11).

Overall, then, both the N-analysis and the *n*-analysis are successful in capturing a wide array of gender-related facts. How can these analyses be distinguished?

3.2.2 Comparing the Analyses

It is not entirely clear whether facts about gender can determine whether lexical decomposition is more successful than the traditional approach to lexical categories. In my previous work (Kramer 2015), I assembled some argumentation in favor of the *n*-analysis, but there is no responding work (to the best of my knowledge) arguing in favor of the N-analysis. In this section, I summarize the arguments for the *n*-analysis.

First, if one adopts the Borer-Chomsky hypothesis of linguistic variation, the N-analysis cannot be correct (Kayne 2005). The Borer-Chomsky hypothesis states that parametric variation is all due to variation in the features on functional heads. Nouns are lexical heads, and yet languages vary in what gender they assign to nouns under the N-analysis (e.g., the word 'morning' is masculine in French, feminine in Hausa, and neuter in Russian; Kramer 2015:2). Having gender on *n* avoids this problem.

Second, the N-analysis is less economical than the *n*-analysis in that it separates biological sex and gender – a step which seems innocent for a language like Spanish, but it is much more suspect for a language like Tamil. For example, as noted in Section 3.2.1, Harris (1991) proposes a lexical rule for Spanish that adds feminine gender to a lexical entry if the lexical entry has the specification "female." However, in Tamil, all human female-referring nouns have feminine gender, so it seems unnecessary to always convert female to feminine if "female-ness" is (in a sense) equivalent to feminine gender in Tamil. In a *n*-analysis, gender features can be semantically interpretable, so that the same [+FEM] feature is interpreted as female and causes feminine gender agreement. The *n*-analysis thus encodes the equivalence of biological sex and gender directly, whereas the N-analysis requires an extra step to do so.

Finally, in Amharic, masculine is the default gender, but certain nouns are feminine when their biological sex is unknown, e.g., *ayt'* 'mouse' (Leslau 1995). These feminine-default nouns are difficult for an N-analysis to deal with. If their grammatical gender is unspecified in their lexical entries, they will be assigned masculine gender since that is the typical default. If their gender is listed as feminine, then any noun referring to a male mouse will trigger feminine agreement (contrary to fact; Kramer 2015:30). In contrast, the *n*-

analysis states that the roots for these nouns are licensed under either interpretable *n* ([+FEM] or [-FEM], creating the interpretations 'female mouse' and 'male mouse') or under the uninterpretable *n* [+FEM] (a mouse with unspecified natural gender, will trigger feminine agreement).

Overall, then, there is some evidence in favor of the *n*-analysis, but a focused defense of the N-analysis remains to be constructed.

4 Gender in Multiple Locations

In some analyses of gender, it has been proposed that gender features can appear on other projections in addition to NP/*n*P. I refer to this as the "multi-location" approach to gender and in this section, I survey these approaches. I suggest that there is little evidence from the basic facts of gender assignment that gender features must be in multiple locations (Section 4.1), but phenomena that impose gender (Section 4.2) and hybrid agreement (Section 4.3) furnish some evidence in favor of a multi-location approach.[9]

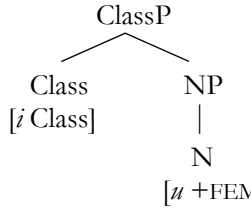
4.1 Multi-Location Approaches: Basic Facts

There are two main types of multi-location analyses that focus on the basic facts of gender assignment. One type has a higher gender feature as a probe and the lower as a goal (Section 4.1.1) and the second type has the higher and lower gender features differ in interpretability (Section 4.1.2). I argue that both types ultimately struggle with capturing the intricate semantics of gender.

4.1.1 Two Locations for Gender: A Higher Probe and a Lower Goal

Several multi-location analyses propose that gender features are in two locations: (i) the root/N, and (ii) a classification/categorization projection immediately dominating the root/N; the head of the classification projection is a probe with an unvalued gender feature and receives its value from the N/root (Picallo 2007, 2008, Armoskaite 2011, Fathi and Lowenstamm 2016). Picallo 2007, 2008 uses this structure to capture commonalities across gender systems based on biological sex/animacy, gender systems traditionally called noun class (e.g., Bantu), and noun classifier systems. She argues that they all have the basic structure in (12), where the class feature is interpretable and the gender(/noun class/noun classifier) feature on N is uninterpretable.

(12)



(Picallo 2008:50, Kramer 2015:61)

However, it is unclear how to interpret the class feature. Picallo (2008:50) notes that the class feature connects non-linguistic entity categorization to the grammar, but the details are not specified. Also, if gender on N is always uninterpretable, it is not obvious how correlations between semantic properties and certain genders are captured.

Similarly to Picallo 2008, Armoskaite 2011 assumes that there is a categorizing projection immediately above a root and its categorizing feature must be valued from the root. The identity of the categorizing feature varies cross-linguistically: biological-sex-based gender for Lithuanian but animacy for the Algonquian language Blackfoot. She claims that the feature on the categorizing projection is uninterpretable, and the feature on the root is interpretable – the opposite of Picallo 2008. However, if gender on the root is always interpretable, it is unclear how the gender on the root for an inanimate noun like *verdad* 'truth' (Spanish) would be interpreted.

Related to this line of analysis is recent work by Fathi and Lowenstamm (2016). Fathi and Lowenstamm propose that, in French, there is always an unvalued gender feature F on *n* that serves as a probe. Either the gender feature is valued from a lower version of F (adjoined to the root) or it is assigned an arbitrary value when the lower F is absent. The lower F is hypothesized to occur with all nouns that distinguish gender phonologically, e.g., *chat* 'male (or generic) cat,' and *chatte* 'female cat.' Fathi and Lowenstamm (2016:486-7) deliberately do not discuss whether the higher and lower F are (un)interpretable. However, they posit a redundancy rule that connects the lower +F to female biological sex in animates that distinguish gender phonologically, successfully predicting that *chatte* refers to female cats.

Fathi and Lowenstamm 2016 thus capture semantic generalizations about gender better than the previous proposals. However, one set of French nouns seems to remain problematic for this approach: nouns that do not display a phonological gender alternation but nevertheless show a correlation between gender and semantic interpretation. Some of these nouns are in (13).

(13)

Masculine		Feminine	
frère	'brother'	soeur	'sister'
oncle	'uncle'	tante	'aunt'
mari	'husband'	femme	'wife'
neveu	'nephew'	nièce	'niece'
étalon	'stallion'	jument	'mare'
bélier	'ram'	brebis	'ewe'

For example, it is highly unlikely that *oncle* 'uncle' and *tante* 'aunt' are derived from the same root and thus they do not express a phonological gender alternation, unlike *chat/chatte*. According to Fathi and Lowenstamm 2016, nouns that do not show a phonological gender alternation lack the lower F, and thus they are assigned a gender arbitrarily. Nevertheless, in all of the nouns in (13), feminine gender correlates with female biological sex and masculine gender correlates with male biological sex. Of course, some animate nouns in French do in fact have an arbitrary gender, like the classic example *la sentinelle* 'the.F (male or female) sentinel.' But it should be possible in Fathi and Lowenstamm's system, for example, for an animate noun that denotes only male entities (e.g., *oncle* 'uncle") to be arbitrarily assigned feminine gender. This is unattested. Overall, then, gender approaches that propose a higher probe gender feature and lower goal gender feature have difficulty accounting for the correlations between gender and semantic interpretation.

4.1.2 Two Locations for Gender: *n* and Root

The other type of multi-location analysis does not assume a probe-goal relationship between the gender features. Instead, it proposes that some gender features are on *n*, while other gender features are on the root; the gender features in the two locations differ in semantic interpretability (Kramer 2009, Steriopolo and Wiltschko 2010, Atkinson 2015; see also Duek 2014 in n.9). In Kramer 2009 and Atkinson 2015, *n* hosts semantic features and the root has non-semantic gender features. In Steriopolo and Wiltschko 2010, it is the opposite: the root has semantic features and *n* has non-semantic gender.

These analyses all suffer from two drawbacks, though. First, as discussed in Section 3.2.1, it is unlikely that gender features are ever on the root. Secondly, it is probably not necessary to have two

positions for gender features in order to account for gender semantics. As described in Section 3, Percus (2011) and Kramer (2014, 2015) assume that gender has a single syntactic position and they account for the semantic generalizations by saying gender features can be either interpretable or uninterpretable. Kramer (2014, 2015) in particular reanalyzes the same data as Kramer 2009 more simply (gender just on *n*) and with no loss of explanatory power.

In sum, there is not strong evidence from the basic facts of gender assignment that gender features are found in multiple syntactic locations.

4.2 Multi-Location Analyses: Gender Imposition

Better evidence for multi-location comes from certain morphosyntactic phenomena that impose gender on a nominal. For example, in Amharic, all diminutives are feminine, even if the noun is typically masculine and the referent is male, as in (14).

(14) a. yɨh bäre b. yɨtʃtʃ bäre

this.M ox this.F ox

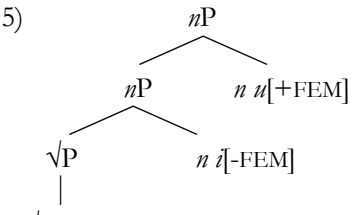
'this ox' 'this small, cute ox' (Kramer 2015:217-218)

Other phenomena in this vein include nominalization (see e.g., Ferrari 2005 on Bantu, Markova 2010 on Bulgarian, Kramer 2015 on multiple languages), evaluative morphology in general (see e.g., Maho 1999:88-9 on Bantu, Wiltschko and Steriopolo 2007 on German, Kramer 2015 on multiple languages), possibly "minor genders" like the locative gender in many Bantu languages (see e.g., Corbett 1991:159-60 on Chichewa; see Carstens 1997 for an alternative analysis), and, occasionally, certain numbers like the singulative (see e.g., Mathieu 2012 on Ojibwe). These phenomena do not always impose a particular gender, but they have the potential to do so in a given language.

Since the gender imposed by these phenomena must have a source, many researchers have proposed that a new syntactic head is merged which has a gender feature on it -- in addition to the gender feature on the base noun (see e.g., Kihm 2005, Ferrari 2005, Ferrari-Bridgers 2008, Kramer 2009, 2015 on nominalization; Ott 2011, Kramer 2015 on diminutives; Mathieu 2012 on singulatives). For example, it is reasonably common to analyze diminutive formation from a lexical decomposition perspective as a

diminutive *n* combining with an *n*P (i.e., as a type of nominalization; see e.g., Wiltschko 2006, Wiltschko and Steriopolo 2007, Steriopolo 2008, Kramer 2015). Then, it is straightforward to propose that the diminutive *n* contains a gender feature, like its brethren *n*'s that combine with roots. Assuming that the highest instance of a gender feature in the DP is the one that is agreed with by any higher targets (see Kramer 2009, 2015, Steriopolo and Wiltschko 2010, Ott 2011), all diminutives are predicted to have the same gender. The structure of the diminutive in (14)b in this analysis is shown in (15) (Amharic is head-final).

(15)



(Kramer 2015:218)

The root √BÄRE first combines with a *n* with an interpretable masculine feature, resulting in the interpretation of the root as a male-referring nominal. Then, this structure combines with the diminutivizing *n* which has an uninterpretable feminine gender, resulting in a nominal that triggers feminine agreement. It is clear that gender is present on both of the *n*'s since the lower *n* is still interpreted (i.e., the ox is still interpreted as male) and the higher *n* serves as the controller for agreement (e.g., on the demonstrative in (14)b).

This is a multi-location approach to gender: gender features are on two distinct *n*'s in (15). So, phenomena that impose a particular gender provide some evidence that gender features can be found in additional locations in the DP.[10]

4.3 Multi-Location Analyses: Hybrid Agreement

Hybrid agreement occurs when a target agrees with some semantic property of a noun's referent -- not with the expected grammatical or formal property of the noun itself (see e.g., Corbett 1979, 1991, 2006). Although hybrid agreement is attested based on human-ness (Corbett 1991) and number (Enger 2004, Ouwayda 2014), the most famous cases involve the target agreeing with the referent's biological sex. For example, the Russian noun *vrač* 'doctor' is formally masculine and thus triggers masculine agreement; yet, when it refers to a female doctor, as in (16), it can optionally trigger feminine agreement.

(16) ona xoroš-ij/**aja** vrač

she good-M/**F** doctor

'She is a good doctor.' (Corbett 1991:238)

Strikingly, the adjectives modifying a hybrid noun can differ in whether they agree with the gender of the noun or the biological sex of the referent.

(17) očen' xoroš-aja glavn-yj vrač

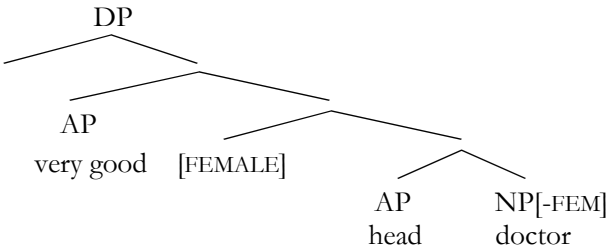
very good-F head-M doctor

'a very good head doctor' (Pesetsky 2013:37)

The adjective closest to the noun agrees with the gender of the noun. In (17), this is because low, non-intersective adjectives always agree with the gender of the noun, and never the biological sex of the referent. However, even with two higher, intersective adjectives, Pesetsky (2013:38) claims that, if they differ in agreement, the leftmost adjective agrees in biological sex and the rightmost in gender with the noun.

Hybrid agreement seems to provide evidence for two gender features within the same DP: the gender of the noun (henceforth: arbitrary gender) and biological sex.[11] One very common approach to hybrid agreement is to posit two different locations for these features: arbitrary gender is on the nominal, but a biological sex feature can be optionally merged higher up in the structure (see e.g., Sauerland 2004, Pereltsvaig 2006, Yatsushiro and Sauerland 2006, Asarina 2009, Steriopolo and Wiltschko 2010, Pesetsky 2013, Rappaport 2013, Landau 2015, Acquaviva 2015, King 2015).[12] This is shown schematically in (18) for the data in (17).

(18)



In some of these proposals (Sauerland 2004, Pereltsvaig 2006, Steriopolo and Wiltschko 2010, Rappaport 2013), the biological sex feature is on/above D, which is too high for it to affect biological sex agreement on adjectives (this holds whether DP-internal agreement is accomplished via the syntactic relation Agree

(Chomsky 2000, 2001) or feature sharing (see e.g., Norris 2014)).[13] However, the remainder of the proposals (Yatsushiro and Sauerland 2006, Asarina 2009, Pesetsky 2013, Landau 2015, Acquaviva 2015) locate the biological sex feature in the middle of the nominal spine, like in (18), either as its own 'gender' head (Asarina 2009, Pesetsky 2013, Acquaviva 2015) or as a feature on Num (Landau 2015). These analyses are thus multi-location approaches to gender.[14]

However, there are several analyses of hybrid agreement that do not rely on a second location for gender features **as controller features**, i.e., as features that are themselves agreed with. For example, Matushansky (2013) and Ackema and Neeleman (2013) develop analyses where the biological sex features that are the main indicator of hybrid agreement are merged on the **targe**t that reflects them morphologically (e.g., on the adjective in (16)). This approach does not require an additional location for gender in the syntax. Similarly, Smith (2015) makes key changes to the mechanism of Agree, and adopts some non-standard assumptions about the merge order of various targets, in order to generate the attested patterns. These analyses show that hybrid agreement is not crystal clear evidence in favor of a second location for gender features in the syntax, and further investigation is necessary to determine which approach is best for hybrid agreement generally (see King 2015, Landau 2015 for recent evaluations of a variety of approaches).

5 Conclusion

This paper has reviewed the question of where gender features are located syntactically. It is clear that there is no GenP, and that gender features are not located (only) on Num. Instead, most of the field agrees that gender features are on the nominal head, whether on N in a traditional approach or on *n* in a lexical decomposition approach. The basic facts of gender assignment do not indicate that gender needs to be anywhere else in the structure. However, gender features are most likely present on additional heads in the structure when we see linguistic phenomena that impose their own gender (e.g., some diminutives). Additionally, hybrid agreement may be best analyzed by having an additional biological sex feature present in the structure, although this remains an open question.

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Biography

Ruth Kramer's research focuses on syntax and morphology, with a special emphasis on the Ethiosemitic language Amharic. She has particular interests in number, gender, agreement, case, and morphological operations, and she has authored papers in these areas for *Syntax, Natural Language and Linguistic Theory, Linguistic Inquiry, Lingua* and *Language Sciences*, among others. Her book *The Morphosyntax of Gender* (Oxford 2015) develops a new cross-linguistic analysis of gender that focuses on gender being located on *n* and integrates natural gender into the syntax. She has taught at the Department of Linguistics at Georgetown University since 2009, and has held visiting positions during that time at the University of Chicago and New York University. She holds a BA in Linguistics and Egyptology from Brown University and a Ph.D. in Linguistics from the University of California, Santa Cruz.

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[1] I also temporarily set aside proposals where GenP has gender features *in addition to* gender features being on the noun (e.g., Puškar 2015); see Section 4.3.

[2] There is also a fair amount of experimental evidence that gender does not project its own phrase, mostly from research on processing, e.g.., di Domenico and de Vincenzi 1995, de Vincenzi and di Domenico 1999, de Vincenzi 1999, Barber and Carreiras 2005 and Carminati 2005.

[3] Much experimental research has also concluded that gender and number are on separate projections in the grammar because they behave differently in processing. See e.g., de Vincenzi and di Domenico 1999, de Vincenzi 1999, Antón-Méndez et al. 2002, Barber and Carreiras 2005, Fuchs, Polinsky and Scontras 2015.

[4] Harbour (2007, 2011) demonstrates that noun class in Kiowa is determined by number-related features like collective/non-collective and count/mass. If Kiowa noun class is understood as a type of gender, this could indicate that a number head is hosting gender-like features. However, Harbour (2007: Ch.3, 2011:566-567) proposes that these number-related noun class properties are located on N, i.e., the typical place for gender features. Thus, Kiowa does not furnish evidence in favor of gender/noun class features being on Num.

[5] To the best of my knowledge, the only exception is the exoskeletal approach of Borer 2005, 2013. In the exoskeletal approach, roots cannot have syntactic features so it follows that gender must not be on the root. However, Borer 2005, 2013 does not contain any specific proposal about the location of gender. If an exoskeletal approach to gender is developed in the future, it would be productive to compare it with the approach to gender discussed in this paper.

[6] Certain languages correlate additional semantic properties with genders. For example, many Bantu languages (in addition to having noun classes based on animacy) contain noun class pairings that are loosely associated with semantic properties like size and shape (see e.g., Denny and Creider 1986, Maho 1999, Katamba 2003:114-119). Also, in Spanish, many fruit trees are masculine while the corresponding fruits are feminine (e.g., *manzano* 'apple tree,' *manzana* 'apple').

However, the correlations are often not categorical; for example, in Spanish, *higuera* 'fig tree' is feminine and *higo* 'fig' is masculine (Harris 1991). Therefore, it is not as obvious how to encode these correlations in the grammar, and I focus on the clearer correlations between biological sex/animacy and gender.

[7] One immediate question in this approach is how to ensure that gender features are interpretable or uninterpretable in the right contexts. Kramer (2014, 2015) assumes that *n*'s come in different flavors (interpretable [+FEM], uninterpretable [-FEM], etc.) and then licensing conditions match up roots and *n*'s. Percus 2011 assumes that certain semantic constraints determine whether or not a given gender feature is interpreted.

[8] Variable-gender nouns are somewhat more complicated in Percus 2011. Since gender features are interpreted presuppositionally, they ensure that the roots that they combine with entail femaleness or maleness. Thus, since *artista* can be interpreted as 'female artist,' the root √ARTISTA must be female-entailing. However, this makes it difficult to derive the interpretation of *artista* as 'male artist' because it is not ideal to have two homophonous, near-synonymous roots √ARTISTA where one is male-entailing and one is female-entailing. See Percus 2011:186-187 for details and an interim solution to the problem involving an additional element at LF that triggers a female interpretation.

[9] A few other phenomena have been argued to provide evidence for multi-location, but I mention them only briefly here due to space limits. Duek 2014 seeks to explain the different agreement patterns for nouns with different types of gender in Brazilian Portuguese; following Kramer (2009), she assumes sex-based gender is on *n* and non-semantic gender is on the root. Panagiotidis (2015) focuses on differences in gender across different types of pronouns, proposing that semantic gender is in an Anim(acy)P that immediately dominates *n*P and non-semantic gender is on *n*.

[10] For this conclusion to hold, it must be true that gender features can be either interpretable or uninterpretable (as argued in Percus 2011 and Kramer 2009, 2014, 2015.) This idea is not universally accepted for gender (see e.g., Zamparelli 2008), but it is a fairly standard assumption that syntactic features can be either interpretable or uninterpretable (see e.g., Chomsky 2000, 2001, Pesetsky and Torrego 2001, 2002, 2007).

[11] This idea has been fruitfully explored in HPSG, but space constraints prevent a thorough review. See in particular Kathol 1999, Wechsler and Zlatić 2000, 2003, 2012, Wechsler 2011, Alsina and Arsenijević 2012ab.

[12] An exception here is Puškar 2015 where arbitrary gender is higher and biological sex lower in order to account for the unusually complicated patterns of hybrid agreement in Bosnian/Serbian/Croatian.

[13] King 2015 has biological gender on D and proposes that an adjective can Agree upwards with D. This allows for a feature on D to affect DP-internal agreement. However, the analysis is then forced to contain a null blocking morpheme that arbitrarily cuts off gender agreement so it does not necessarily reach lower adjectives.

[14] An important question is whether the higher gender feature is present in every DP. Steriopolo and Wiltschko 2010 and King 2015 propose that certain Russian nouns lack the high biological sex feature because they do not participate in hybrid agreement (e.g., *čelovek* 'person' is always masculine despite being Class 1 like *vrač* 'doctor'). However, as noted in Matushansky 2013, it is not obvious how it is ensured that high gender does not appear. Overall, any complete analysis of hybrid nouns must explain why some nouns are not hybrids, and it is unclear how this will impact the syntax of gender (see Asarina 2009 and Rappaport 2013 for some additional discussion of how to limit hybrid agreement).