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Asymmetric inflection in Berber: the view from gender

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Abstract: This paper examines the distribution of grammatical markers in Tashlhiyt Berber nouns, with special attention to the gender marker. It asks why the feminine marker [t] is both prefixed and suffixed to the nominal stem, and what underlies the cooccurrence restrictions it obeys when combined with other grammatical markers. Based on evidence from native and loanwords morphology, it is proposed that the canonical locus of gender is suffixal and that its alleged circumfixal nature results from a copy of a +GEN feature to an obligatory affixal position to the left of the stem. As a result, a prefixal [t] appears whenever the noun is feminine and the prefixal position is available. This systematically happens in native nouns, as opposed to loanwords, whose semantically null prefix [l] prevents the feminine prefix from being realized. The proposal also explains several otherwise unmotivated facts in the nominal morphology, namely (i) the absence in Tashlhiyt Berber of consonant-initial nouns, (ii) the lack of feminine nouns beginning with a [tC] cluster in the free state, and (iii) the ubiquity of the prefix [l] in borrowed nouns. Evaluative morphology provides further evidence for the prefixal position in loanwords and in compounds: since their prefixal position is occupied by the [l] prefix and the bound noun [bu] ‘owner of/characterized by’, their augmentatives and diminutives undergo a process of thematization which entails the addition of another prefixal position, e.g. [l-kamjun] ‘truck’ / [a-l-kamjun] (AUG).

Keywords: Berber, Compounds, Gender, loanwords, Nominal Morphology

1. Introduction

Berber nouns are inflected for gender and number (as well as “state”, to be presented later). There are two genders. As illustrated in (1a), masculine grammatical gender can be described as having no overt marker; feminine grammatical gender is most often marked by a consonant [t] both prefixed and suffixed to the stem in the singular forms. Equi-radical pairs do not necessarily reference the same type of entity (1b). The examples in this paper are all from the Tashlhiyt variety, of which the second author is a native speaker; but the facts are similar in other Berber varieties.¹

1) Equi-radical M-F nouns

	M.SG		FM.SG	
a.	afruχ	‘boy’	t-afruχ-t	‘girl’
	afunas	‘ox’	t-afunas-t	‘cow’
b.	asaru	‘pipeline’	t-asaru-t	‘key’
	agnaw	‘dumb’	t-agnaw-t	‘dumb’
	izi	‘fly’	t-izi-t	‘midge’

For many animate nouns, a paradigm such as (2) can be found. Such paradigms reveal two other alternations. First, the initial vowel [a] of the singular is not part of the stem (cf. Basset 1932, 1945; Dell & Jebbour 1995; Dell & Elmedlaoui 2002: 29; El Moujahid 1997; Guerssel 1992; *contra* Iazzi 2018: 794): in both M and F, it alternates with [i] in the plural. We will return to this point. More importantly for the immediate purpose, the feminine plural involves only a *prefix* [t].

¹ Abbreviations used: AUG = augmentative, CS = Construct State, DIM = diminutive, FS = Free state, F = Feminine, M = Masculine, PL = Plural, SG = Singular.

2) Full SG-PL equi-radical paradigm (in Free State)

	SG	PL
'ox'	a-funas	i-funas-n
'cow'	t-a-funas-t	t-i-funas-i-n

Similarly, some feminine *singular* nouns display a [t] only word-initially:

3) Feminine SG nouns with no suffix [t]

a. tawda	'fear'	d. tala	'small hill'	g. tassmi	'needle'
b. turfa	'ally'	e. tijmi	'sauce'	h. tili	'goat'
c. tamda	'pond'	f. taguni	'sleep'	i. tizi	'period'

Based on (2) and (3), one may conclude that unlike most other Afro-Asiatic languages, the gender marker in Tashlhiyt is predominantly prefixal.

However, there is reason to think that morphological activity related to gender also occurs at the *right* edge of the nouns in (2) and (3). In (2), the vowel [-i-] appears between the stem and the plural marker only in feminine nouns. In (3), all of the items on the list are V-final – indeed, with some very specific exceptions, there is no singular feminine noun in Tashlhiyt beginning in [t] and ending in a consonant other than [t]. It seems that for a noun to be feminine, its right extremity must be marked for this property.

Loanwords from Moroccan Arabic and European languages conform to this generalization: when grammatically feminine, they all display a marker at the right edge. A final [a] correlates with feminine gender in (4a). That this final vowel is to be considered a gender marker is suggested by the Arabic loans in (4b), in which the original Arabic [a] has been substituted in Tashlhiyt by [t]. Some nouns even exhibit variation between final [a] and final [t]: [lmus^ʕiba] is also acceptable for 'catastrophe', and so is [lħrfa] for 'profession'. Importantly, moreover, these nouns do not exhibit a prefix [t-]; instead they all begin with [l], which corresponds to the definite article in Arabic (but does not have that function in Tashlhiyt, cf. Dell & Jebbour 1991: 129; Dell & Elmedlaoui 2002, 35; Iazzi 2018: 888).

4) FSG nouns with suffix [a] and no prefix [t], originating in Arabic

a. lmakina	'machine'	b. lħrf-t	'profession, craft'
lkuzina	'kitchen'	lbhim-t	'livestock'
lmagaza	'store'	lʒn-t	'heaven'
lbaraka	'blessing'	lxnf-t	'bag'
lqamiʒa	'shirt'	lxdm-t	'job'
lmagana	'watch'	lmus ^ʕ ib-t	'catastrophe'

Incorporating the nouns in (4), one may generalize as follows. There are feminine nouns with no prefixal gender marker, but there are *no* feminine nouns with no suffixal marker. The following question is immediately raised: why and when does one find, alongside a feminine suffix, a feminine prefix? In this paper, we provide the following answer:

5) The distribution of the prefixal gender marking

All nouns in Berber *must* begin with a prefixal *site*:

- Features from the nominal base are copied onto that position and realized there *if* possible.
- A feature +GEN in this prefixal position is realized [t].

It follows from our proposal that the two [t]'s in e.g. [t-a-funas-t] are not the same. Rather, the one to the right of the stem is basic. Its distribution is arbitrary – it is determined lexically. The prefixal [t], in contrast, appears predictably whenever the noun to its right is feminine and the prefixal position is available. In other terms, the inflection is asymmetric: the feature to the right of the noun is inherent, the one to its left is contextual. For this reason, there is no reason to call [t...t] a circumfix or a discontinuous morpheme, as some authors do (Boukhris et al. 2008: 35; Taine-Cheikh 2006; Iazzi 2018: 834). Rather, the situation is in fact not very different from what is found for instance in Romance ART+N, e.g. Portuguese [ə kazə] ‘a house’.

Once the asymmetry in the nature of gender markers at the left and right edges is recognized, one can conclude that as in all other Afro-Asiatic languages, the canonical position of feminine gender in Tashlhiyt is to the right of the stem. It is not surprising that the phonological form of the gender marker in Tashlhiyt is mostly either /-t/ or /-a/, as in Hebrew and Arabic.

It will be shown below that the proposal in (5) is supported by its ability to explain several otherwise unmotivated facts about gender morphology in Berber. First, all loanwords in Tashlhiyt begin with a semantically-null prefix [l-]. Second, noun stems can begin with non affixal vowels, but not consonants. Third, the prefix [t] can precede a consonant only in the “construct state”, as opposed to [l-] which can occur directly before a consonant regardless of the state of the noun.

The paper is structured as follows. Section 2 presents the data more fully, adding to the discussion the common [bu]-compounds. It illustrates the set of generalizations just mentioned, and explains why some of them are typologically odd. Section 3 includes the analysis. It shows how the idea of an obligatory prefixal position can be used to explain away the odd distributional facts of the data section. A set of realization rules is provided that covers co-occurrences of and incompatibilities between regular markers, and a logic is presented for the appearance or lack of gender markers, and indeed inflection in general, at the left edge of nouns. A final subsection discusses corroborating evidence from derived augmentatives and diminutives, and section 4 concludes.

2. Noun types and their inflection, with special attention to gender inflection

This section provides the empirical basis for the claim in (5) through a closer, fuller examination of the Tashlhiyt data.

2.1. V-initial nouns

The paradigm in (6a) elaborates on (2) above. It adds the category of Free or Construct state (FS, CS). The FS and CS are forms that the noun takes in a well-defined set of syntactic environments (cf. Ouhalla 1988; Bader & Kenstowicz 1987; Guerssel 1992, 1995; Ennaji 2001; Bendjaballah & Haiden 2008; Lahrouchi 2013, among others). The FS is in addition the citation form. Importantly for the study of the expression of nominal gender, not all paradigms are full as in (6a). Some feminine nouns, such as the one in (6b), do not have a masculine counterpart, yet they exhibit the same alternations at the left edge as feminine nouns with a masculine counterpart. This is especially common for feminine nouns ending in a vowel.

6) Fuller paradigm of M-F pair of native nouns

		SG	PL
a.	‘ox’	FS a-funas	i-funas-n
		CS u-funas	i-funas-n
	‘cow’	FS t-a-funas-t	t-i-funas-i-n
		CS t-funas-t	t-funas-i-n
b.	‘thing’	FS t-a-ɣaws-a	t-i-ɣaws-iw-i-n
		CS t-ɣaws-a	t-ɣaws-iw-i-n

The initial vowel of the item reflects the different values of the paradigm. Let us call it the “theme vowel”, V_{th} . As already mentioned, one may generalize that V_{th} is [a] in the SG, [i] in the PL. The CS is marked by [u] in the MSG (as well as in some plural forms, see next paragraph); and by the absence of V_{th} in the F. Importantly for the present purpose, this absence derives an initial sequence [tC].

One may conclude from (6) that all stems begin with a consonant, like [-funas-]. However, consider the two masculine nouns in (7). The vowel in the beginning of the noun ‘mountain’ behaves like the V_{th} of ‘ox’ in (6) above: it alternates with [i] in the PL, [u] in the CS.SG. In contrast, the initial vowel of ‘widower’ does not behave at all like a V_{th} . Instead, it is constant throughout the paradigm: it is not replaced by the [i] of the PL *or* the [u] of the CS.SG, which instead appears as an initial glide [w] (both in the SG *and* in the PL).

7) Thematic vs non-thematic native nouns - masculine

		SG	PL
a.	‘mountain’	FS a-drar	i-drar-n
		CS u-drar	i-drar-n
b.	‘widower’	FS adgal	adgal-n
		CS w-adgal	w-adgal-n

Since the initial stem vowel in (7b) is non-thematic, it is considered by all scholars as non-prefixal. It must be concluded then that **i.** some stems are V-initial, and **ii.** V-initial stems do not admit the FS and PL markers.

If masculine stems may begin with non-thematic vowels, one expects this option to be found among feminine nouns, too. And indeed it is. The nouns in (8) all involve a stem-initial vowel that is not thematic – it is not replaced by [i] in the plural. Note that the *right* extremity of the singular forms of such nouns are unsurprising: one finds there either a suffix [t] or a vowel. Importantly, both are easily identified as suffixes in (8), because both are regularly replaced in the plural by another suffix.

8) Non-thematic feminine nouns

		SG	PL
a.	‘fist’	t-ukkim-t	t-ukkim-i-n
	‘tree, branch’	t-addag-t	t-addag-i-n
	‘big bag’	t-arjal-t	t-arjal-i-n
b.	‘ally’	t-urf-a	t-urf-iw-i-n
	‘reservoir’	t-amd-a	t-amd-iw-i-n
	‘ladder’	t-asskal-a	t-asskal-iw-in

The generalization in (9) emerges:

9) Non-thematic feminine nouns

The appearance of a prefix /t/ on a stem is *not* dependent on the existence of a thematic vowel V_{th} .

We saw that some stems begin with a consonant (e.g. [-funas-]). In masculine nouns, such bases are always preceded by V_{th} . As for feminine nouns, if (9) is correct, one expects to find /t/ prefixed directly to C-initial stems, too, without the mediation of V_{th} . In other words, all other things being equal, one expects to find feminine nouns beginning with [t-C]. *No such nouns are found*. No feminine noun in Tashlhiyt begins with [tC] in the FS. This is so even though no phonological problem would be posed by such a cluster, as evidenced by the F.CS forms of nouns in (6). Why does one find such clusters only in this very specific configuration?

The beginning of an answer to this question was already given in the introduction: [t] realizes a [+GEN] feature on to the left extremity of all nouns *when possible*. We will elaborate on this answer in the analysis below. For now, let us concentrate on yet another aspect of our proposal. We've seen that gender must be marked on bases (at the right edge). Given the asymmetry between the two edges of the word, one might expect to find cases where gender is *only* expressed in its base position. This situation is indeed found in nouns like [l-ħrfa] 'profession', which we will examine in the next section.

2.2 C-initial nouns

There are two large groups of nouns beginning with a consonant (other than [t]): loans and compounds.

As already mentioned, loans, regardless of the source language, generally begin with /l/. These are masculine (10a) unless the noun ends in [a] or [t], in which case they are feminine (10b), again irrespective of the gender of the source language. As mentioned in the introduction, the final /a/ of Arabic is occasionally replaced by [t]. After the initial /l/ there can be either a vowel or consonant. Borrowed nouns do not have distinct CS forms, nor do they exhibit full M-F paradigms like the native noun in (6a) above (although evaluative morphology can be applied to these nouns, see section 3.3).

10) Loans beginning with /l/

a.	Ibanju	'bathtub' (Sp. [baɲo])
	lbar ^s aɣ ^s	'dam' (Fr [baʁaʒ])
	las ^s l	'ancestry' (Ar [as ^s l])
	lʔor ^s dinatur	'computer' (Fr. [oʁdinatœʁ])
	ladris	'address' (Fr. [adʁes])
b.	lkuzina	'kitchen' (Sp. [kosina])
	lmus ^s ibt~lmus ^s iba	'catastrophe' (Ar. [mus ^s iba])
	lħrft~lħrfa	'profession' (Ar. [ħrfa])
	lbakit _F	'package' (Fr. [pake] _M)
	loqt _F	'time' (Ar. [wəqt] _M)
	l'anba	'lamp' (Sp. [lampa])

As mentioned, the initial /l/ originates in the definite article of Arabic, but it does not carry that function in Tashlhiyt. Like its cognate in Arabic, it assimilates to following adjacent coronals (11a). Significantly for our purpose, if that consonant is a [t] and the /l/ assimilates to it, the

noun is still masculine (given that it does not end with [a] or [t]) (11b). In other words, the phonetic presence of a [t] at the left edge of a noun does not suffice for it to be feminine. In contrast, the presence of /a/ or /t/ at the *right* edge of the loaned nouns, even if that noun is masculine in the source language, *is* interpreted as a gender marker in Tashlhiyt (11a and 10b above).

11) loans beginning with /l/ with coronal-initial bases

- a. ʒ-ʒ^ʕaʕ^ʕd^ʕa_F ‘garden’ (<Fr. [ʒardɛ̃]_M)
- r-r^ʕest^ʕor^ʕa_F ‘restaurant’ (<Fr. [restorã]_M)
- s-srtafika_F ‘certificate’ (<Fr. [sɛrtifika]_M)
- b. t-træn_M ‘train’ (<Sp. [tren])
- t-tilifun_M ‘telephone’ (<Fr. [telefɔn])
- t^ʕ-t^ʕr^ʕbu_M ‘Turkish hat’ (<Ar. [t^ʕr^ʕboʃ])

Again, this is in conformity with the generalization regarding the non-availability of [tC] outside the CS, a category that does not exist in loans.

The reader is referred to Dell & Elmedlaoui (2002:35-6) for several reasons to analyze the nouns in (11) as synchronically involving an initial underlying /l/, as well as this /l/ being a prefix, rather than part of the stem. The latter conclusion seems evident enough in that if /l/ were not a prefix, the reason that all borrowed nouns begin with /l/ would be lost.

The second group of C-initial nouns comprises of head-initial compounds of the form [bu/mmu+N]. The non-head N regularly (though not always) carries inflectional morphology. Where relevant, it is in the CS. Such compounds can designate inanimate or animate entities. [bu] designates a masculine reference and [mmu] a feminine reference, but such marking is limited to compounds with human reference.

12) Compounds headed by [bu] (/[mmu])

	M	F	
a.	bu-tgmmi	mmu-tgmmi	‘home-owner’ (tgmmi ‘home.CS’)
	bu-uħlig	mmu-uħlig	‘big eater’ (uħlig ‘stomach.CS’)
	bu-tħanut	mmu-tħanut	‘shopkeeper’ (tħanut ‘room.CS’)
	bu-ugajju	mmu-ugajju	‘stubborn person’ (ugajju ‘head.CS’)
b.	bu-mħnd	*mmu-mħnd	‘hedgehog’ (mħnd ‘proper name’)
	bu-tagant	*mmu-tagant	‘boar’ (tagant ‘forest.CS’)
	bu-ttgra	*mmu-ttgra	‘turtle’ (ttgra is unattested)
	bu-s ^ʕ ffir ^ʕ	*mmu-s ^ʕ ffir ^ʕ	‘jaundice’ (s ^ʕ ffir ^ʕ is unattested)

Note that nouns beginning with [bu] are always masculine, regardless of the segment at the right edge; similarly, nouns beginning with [mmu] are always feminine. This, alongside the simple fact that gender is marked through the alternation [bu/mmu] in (12a), suffices to understand such nouns as compounds headed by the first morpheme. Still, importantly, [bu/mmu] are bound heads: they do not appear in isolation.

Parallel to the human/non-human distinction in (12), the two sub-types of [bu] compounds are also semantically compositional (12a) vs. opaque (12b). A ‘home owner’ is much more transparently ‘he of the home’ than a ‘boar’ is ‘he of the forest’; and of course, some of the examples of (12b) involve a non-head which is altogether unattested in isolation. As is common in compounds, lack of compositionality is reflected in the degree to which the non-head can be inflected (See for instance Borer 2013 and references therein). The inflectional markers of the

non-head [t-gmmi] ‘F.CS-home.F’ (12a) can be altered, and the reference remains of the same type: [bu-t-g^wmma] ‘owner of several houses’. In contrast, the seemingly inflectional markers of the non-head in (12b) cannot be altered without losing the meaning of the compound and rendering it compositional: [bu-t-agan-i-n] cannot mean ‘boars’, only the compositional ‘he of the forests’.² As will be shown in section 3.3, the two types of [bu]-compounds differ also in that evaluative morphology can apply only to non-compositional [bu]-compounds.

Besides [bu]-compounds, there are very few other C-initial nouns in Tashlhiyt that do not begin with /l/. Among these, the generalization already established about gender seems to hold: if the noun ends in [a] it will be feminine, e.g. the seemingly native feminine [muka] ‘owl’; and if it ends in a consonant other than [t] it will be masculine, e.g. [l^saz^s] ‘hunger’ and [fad] ‘thirst’ or the Arabic masculine loan [sknʒbir] ‘ginger’.³

To summarize, this subsection elaborated on C-initial nouns, some of which were already presented in the introduction. These support our view of the asymmetry between the right and left edges with respect to gender marking. Among nouns beginning with C all feminine nouns are marked as such at the right edge of the word, and those that aren’t are left-headed compounds. While several loans begin with [tC], that [t] is underlyingly an /l/ and is not interpreted as feminine; such nouns are therefore not counter-examples to the generalization as to the impossibility of the prefix [t] appearing before a consonant in the FS.

But alongside this distributional lacuna, we can now state another, much larger one. Setting aside compounds with [bu/mmu], *C-initial nouns where C is not a prefix are close to non-existent in Berber*. Even loans, instead of being borrowed in their original form, are fitted with a prefix.

2.3 Taking stock

Let us take stock of all of the available configurations in the *entire* nominal lexicon, concentrating on the left edge of the item. As shown in (13), a noun can begin with:

13) Entities at the left edge

- i. V_{th} (MSG [a-], MPL [i-])
- ii. State marker [u-] or [w-]
- iii. Gender marker [t-]
- iv. Prefix /l-/
- v. Bound head [bu-/mmu-]
or
- vi. non-thematic vowel

Given the above description, one may generalize as follows:

14) Generalization

If a noun is not prefixed, it is vowel-initial.

² Pluralization of all [bu]-compounds is achieved using an external particle [id]: [id bu tagant] ‘boars’, [id bu tgmimi] ‘home owners’. In some varieties, there is a F variant [istt] for nouns headed by [mmu]: [mmu-ugajju] (FSG) / [istt mmu-ugajju] (FPL) ‘stubborn person’. There are many more intriguing facts about [bu]-compounds that are beyond the scope of this paper. See Bensoukas (2015).

³ Owing to the rareness of C-initial nouns with a C other than /l/, we’ve not been able to find one that ends in [t]. We predict it will be interpreted as feminine.

This is a *strange* distributional fact, to say the least. Cross-linguistically, onsetless syllables are much more marked than syllables with onsets. If items without a prefix exist, and can begin with a vowel, they should also be able to begin with a consonant. Yet as we just saw, apart from a very few examples (see previous subsection), the only possibility for a noun to begin with a consonant is through prefixation.

The key to understanding this strange property is the other intriguing property of Tashlhiyt, mentioned in the end of the previous subsection, namely that all loans begin with a prefix. Why is that? It is time to provide an answer to all these questions.

3. Analysis

In the preceding section, three intriguing properties have been identified in the system: **(i)** unprefixated nouns must be V-initial; **(ii)** loans must be prefixated; and **(iii)** the prefix [t] appears before C only in the CS form of thematic nouns, although there is no general phonological problem with [tC]. We propose that all three properties follow from one assumption:

15) Proposal

There is an obligatory prefixal site for all nouns.

Property **(i)** above becomes much less strange if (15) is accepted. V-initial items are not unprefixated; rather, as we will show below, the initial vowel of the stem fills the obligatory prefixal position, thus blocking the realization of some, but not all of the thematic prefixes.

Property **(ii)** also follows directly from (15). In order to be accommodated in the language, borrowed nouns must be prefixated. The main donor language, Moroccan Arabic, provides what no doubt was initially recognized as a prefix (specifically, a definite article). The marker has since been generalized as a native strategy that is applied to loanwords. This allows such nouns to be exempted from the general prefixal marking: since the prefixal site is occupied, no other prefixal morphology – including the gender marker – can be associated to this site.

Finally, property **(iii)** combines both aspects of the analysis. As will be formalized immediately, only in the CS of thematic nouns with C-initial stems is the prefixal position otherwise empty; and so only in these will one find a [t] before a consonant. In /l/-initial noun, that site is occupied.

Thus, the cloud of strangeness that engulfed the morpho-phonology of Tashlhiyt nouns dissipates once one adopts (15). Of course, several new (and more technical) questions are raised. We answer them in the ensuing account. This account is ordered as was the presentation of the data. Section 3.1 examines native nouns, both with V_{th} and without it, and Section 3.2 covers the relevant aspects of loans and compounds. Section 3.3 discusses relevant cases of variation as well as a topic we've not yet mentioned – evaluative morphology – and shows how these corroborate our proposal.

3.1 Native nouns

3.1.1 Thematic nouns

In (16), we recall the full paradigm of native thematic nouns, i.e. nouns with C-initial stems.

16) Fuller paradigm of M-F pair of native nouns

		SG	PL
‘ox’	FS	a-funas	i-funas-n
	CS	u-funas	i-funas-n
‘cow’	FS	t-a-funas-t	t-i-funas-i-n
	CS	t-funas-t	t-funas-i-n

We will now show how the realization of features on the obligatory prefixal position can be formalized such that in the feminine CS, and only in this position, only [t] is found. While this formalization is *not* the central claim of the paper, it is provided for completeness.

To express the three dimensions of inflection, we use the following three binary features [±GEN] [±SG] [±FS]. The rules converting formal features to exponents are given in (17):

17) Realization rules

	FEATURES		REALIZATION
a.	+SG,+FS	↔	/a/
b.	−SG,+FS	↔	/i/
c.	−FS,−GEN	↔	/u/
d.	+GEN	↔	/t/

None of the exponents in (17) is specified for all three features. We make the following assumption: it is preferable to leave a formal feature unrealized than to use an exponent that is specified as realizing the opposite value of a required feature. With this assumption, the feature specifications in the realization rules in (17) cover all of the mutual exclusions among prefixes in the data. /a/ and /u/ are mutually exclusive because they denote different states. In the MSG.FS [a-funas], only /a/ can be used, because /u/ is specified for −FS; even though that would mean that [−GEN] will remain unrealized. In the MSG.CS [u-funas], only /u/ can be used because /a/ is specified for +FS; and [+SG] remains unrealized. For the same reason, /u/ and /t/ are mutually exclusive: in both FM.CS forms, /u/ cannot be used because it denotes [−GEN]. The CS remains unexpressed. Finally, /t/ and /a/ will not be combined in the CS because /a/ is specified as [+FS].

At the same time, (17) allows for the attested combinations. The prefix /t/ can be combined with /a/ in the FSG.FS [ta-funas-t] and with /i/ in the MSG.FS [ti-funas-i-n] because /a/ and /i/ are not specified for gender. Furthermore, the CS marker was formalized as unspecified for number, because, as will be recalled, it does appear on both singular and plural native nouns with non-thematic vowels like [w-adgal] ‘CS-widower’ [w-adgal-n] ‘CS-widower-PL’.⁴

A list like (17) for the *right* edge of the noun is beyond the scope of this paper. For the present purpose, the take-home message is the following: there is an obligatory prefixal position, and it so happens that in the F.CS it is filled only with [t]. That is the reason that [tC] clusters only appear in this context.

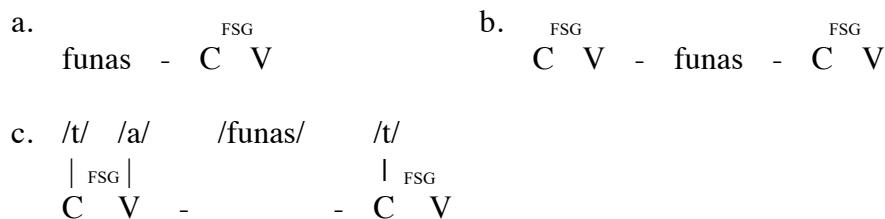
⁴ One problem of the account sketched out in the text is the CS [i-funas-n]. According to our rules in (17), this form should be *[u-funas-n], because [i] is specified as +FS. This objection can be countered by assuming that CS forms are derived from FS ones. Following Dell & Elmedlaoui (2002: 30), the CS /w/ is inserted as /j/ because of the existence of the FS [i] in its base: CS+ifunasn => /j+i+funas-n/. Subsequently, following our own rules, the +FS [i] is deleted because it conflicts with the required features, and /j+funas+n/ is realized [ifunasn]. Dell & Elmedlaoui propose two ordered rules (assimilation, followed by deletion); here motivation is provided for the order (CS is derived from FS), and deletion follows from (17). Like their account, ours predicts the appearance of /j/ before nouns with non-thematic initial [i], e.g. /w-a-isk/ => /w-isk/ => [j-isk] ‘CS.SG-horn’. The assumption of a derivation FS=>CS bears no incidence on other forms.

Gender marking on the prefixal position begins to illustrate what we mean by the right edge being the canonical locus of gender. Let us begin with the most regular cases, such as [a-funas] and [t-a-funas-t], which we can now gloss as ‘SG.FS-bovine.M’ and ‘F-SG.FS-bovine-F’. In [a-funas], there is no detectable suffixal position. In contrast, as we’ve been claiming, the prefixal position is present and filled by [a], which we’ve analyzed as a [+SG, +FS] marker. In other words, unlike the suffixal position, the prefixal position is not arbitrarily distributed. Every noun must involve it.

In this context, consider the formation [t-a-funas-t]. Unlike M [a-funas], here the base carries a lexical suffixal position with the feature +GEN (18a). All feminine nouns are obligatorily equipped with this suffixal position. However, as proposed, all nouns must also be prefixed. The prefixal position is added by rule, and the features of the nominal base are *copied* onto that prefix (18b). Then they are realized as in (18c). Singular number has no suffixal exponent, as evidenced by [a-funas]; only F will be expressed in the suffix. The same exponent will be used on the prefixal position, in combination with the SG.FS exponent /a/. For the reasons explained above, if the prefixal position includes a feature [-FS], only [t] will appear in it.

For all of our representations, we adopt the basic assumption of Strict CV (Lowenstamm 1996, Scheer 2004): the only skeletal unit is CV. Thus, phonetically consonant-final nouns end in an empty V-slot, and phonetically vowel-initial nouns begin with an empty C-slot.

18) Realization of gender features



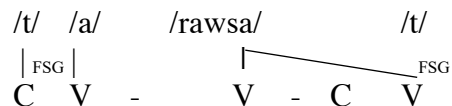
The view in (18) makes explicit the claim regarding the canonical position of gender. Gender originates in the right periphery, and then features are copied onto the prefixal position. Thus, gender in Berber, like in other Afro-Asiatic language, is principally suffixed, rather than prefixed. This claim will be further supported by nouns that lack initial gender marker altogether (see section 3.2).

One difference between the Berber and other languages of its family is that gender is *also* expressed before the noun. Nevertheless, this configuration is not at all unique to Berber; indeed, the structure in (18) is in fact very common in other languages. For instance, as foreshadowed in the introduction, it is very similar to that of Romance DPs. To illustrate, Portuguese DEF+N regularly gives rise to a root “circumfixed” by identical markers, e.g. [ə kaz-ə] ‘the house’. Just like in Tashlhiyt, a prefix inflects according to the grammatical properties of its base. No one has claimed that Portuguese involves a “circumfix” or “discontinuous morpheme” [ə-...-ə]. Similarly, then, once the obligatoriness of the prefix is accepted, there is no reason to do so for Berber.

One might object to the analogy by insisting that in Portuguese, prefixes are not obligatory. We contend that this difference follows from the basic functions of the prefixal position in the two languages. Examining the Berber paradigm in (16), as well as the rules in (17), one remarks that one feature is *never* present in the inflection at the right edge, and can only appear to its left: state. If the prefixal position is taken to denote this property, then its obligatory nature follows: by definition all nouns are either in the FS or CS. In contrast, in Romance nouns needn’t be either definite or indefinite – generic status for instance can be expressed by eliminating the prefix, leaving the noun “bare”.

Other parallels between the two languages lead to further insight into the Berber system. In languages like Portuguese, the marking on the nominal stem is of course not always identical to the one found on the article to its left, e.g. [ə kə̃s-ə̃w] ‘the song’. The same is true, as we saw, for Berber nouns. When these end in a vowel [i] or [a], they are feminine, e.g. [t-a-ɣaws-a] ‘F-SG.FS-thing-F’, [t-a-gud^s-i] ‘F-SG.FS-sadness-F’. Rather than say that /i/ or /a/ are gender markers, we assume that these final vowels occupy the final site, as in (19). The final vowel is thus phonologically-long; but this length is not reflected in its phonetic form, as Berber does not exhibit surface length distinctions in vowels. We return to the floating /t/ in (19) below.

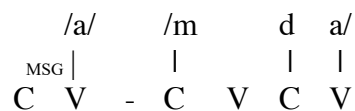
19) Vowel-final feminine thematic nouns



Thus, another asymmetry that is shared by Berber and Romance languages is revealed: while the way the gender marker is realized on the right edge is somewhat idiosyncratic, its realization on the prefixal left edge is always the same ([t] in Berber and [ə] in e.g. Portuguese). This additional similarity between Berber and Romance further supports our stance regarding the more basic, less predictable status of the suffixal site. In contrast, the distribution of markers in the prefixal site, as well as the existence of that site, are completely regular and a matter of grammar rather than the lexicon.

The analysis makes two important predictions. Since the distribution of the final inflectional CV is arbitrary, and the stem-final vowel is not the exponent of gender, we predict that vowel-final stems without a suffixal CV should be attested. Such a noun would be masculine and end in a vowel. This prediction is borne out.

20) Vowel-final, thematic masculine noun: [amda] ‘pond’



The second prediction crucially depends on the proposal regarding the asymmetric status of the two gender positions. Given that the gender feature on the prefixal position is copied from the *suffixal* inflectional CV, which is absent from nouns like [amda] in (20), one predicts that V-final masculine nouns will never carry a prefixed [t]. In other words, a masculine noun [t-a-Ca] should not exist, even though [a-C(...)a] does exist. This prediction is also correct.

Finally, going back to the feminine [ta-ɣaws-a] in (19), it is important for our analysis that by occupying the final position the vowel /a/ blocks the regular realization of /t/ in this position. This is probably due to the “no line-crossing convention” (Goldsmith 1976): in order to reach the last C-slot, /t/ would have to reach “through” the line associating /a/ to the final V-slot. Thus, the existence of a single suffixal site of *limited space*, CV above, is crucial to our analysis: without such a limited site, there would be no reason for the final vowel and the /t/ to be mutually exclusive. The issue of blocking will continue to be central in the analysis of the following subsections.

3.1.2 Non-thematic nouns

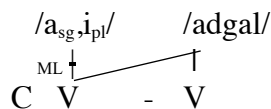
The facts of non-thematic native nouns are recalled in (21). As opposed to the thematic noun in (21a), the initial vowel of the non-thematic ones in (21b-d) is constant throughout the paradigm. It is not replaced by [i] in the plural, and the CS marker is added to it but does not delete it in both MSG and MPL. The absence of a CS marker from the F nouns in (21c,d) is a general fact explained in the previous subsection.

21) Thematic vs non-thematic native nouns - masculine

			SG	PL
a. 'mountain' _M	FS	a-drar	i-drar-n	
	CS	u-drar	i-drar-n	
b. 'widower' _M	FS	adgal	adgal-n	
	CS	w-adgal	w-adgal-n	
c. 'tree, branch' _F	FS/CS	t-addag-t	t-addag-i-n	
d. 'alliance' _F	FS/CS	t-urf-a	t-urf-iw-i-n	

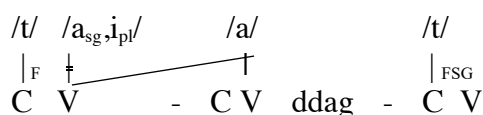
The blocking of the free state /a/ and /i/ is explained in the same way as the blocking of /t/ in (19). As shown in (22), the vowel of the theme spreads to occupy the V-position of the prefixal CV.⁵

22) Masculine non-thematic nouns:



This effect is correctly predicted to co-exist with gender marking, since the latter is consonantal and so there is no line-crossing.

23) Feminine non-thematic nouns

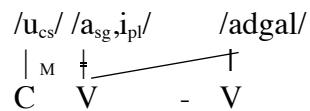


Finally, the co-existence of the CS and number markers in M nouns is also explained if one assumes that /u/ can map onto a consonantal position:⁶

⁵ Note that, as in the case of the long final vowel in (19), the spreading of the theme vowel to occupy two V-slots has no effect on its phonetic realization.

⁶ The view in (24) turns the spotlight to the asymmetry between the CS marker /u/ and the PL marker /i/. Both of the vowels /u/ and /i/ can be realized as glides [w,j]. Yet in the inflection at the left edge they are treated differently: the CS /u/ is not blocked by the spreading of the initial vowel of the stem. Concretely, why is the plural FS not *[jadgaln]? We do not have an answer to this question. Possibly, one can be found in the derivation of the CS from the FS. Another direction is the asymmetry between features: /i/ realizes as copied feature, whereas the state markers never appears to the right of the stem. A third possibility is to stipulate that number may not be realized on the C-slot of the prefixal CV.

24) Masculine non-thematic nouns in the CS



Having covered all of the issues raised by the inflection of native nouns, we proceed to treat borrowed ones.

3.2 C-initial nouns: loans and compounds

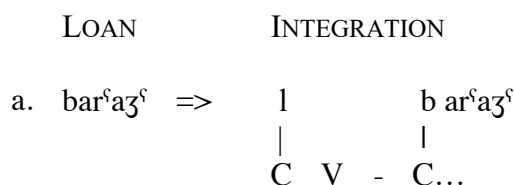
As will be recalled with the aid of (25), all loans begin with a prefixed /l/, which sometimes assimilates to the first consonant of the base. As already explained, their gender depends by and large on their right extremity.

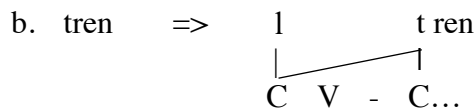
25) Loans beginning with /l/

- a. l-banju 'bathtub' (Sp. [baɲo])
- l-bar^ʕaʒ^ʕ 'damn' (Fr [baraʒ])
- l-as^ʕl 'ancestry' (Ar [as^ʕl])
- l-ordinatir 'computer' (Fr. [oʁdinatœʁ])
- l-adris 'adresse' (Fr. [adʁes])
- b. l-kuzina_F 'kitchen' (Sp. [kosina])
- s-srtafika_F 'certificate' (Fr. [sertifika]_M)
- l-ħrfa_F 'profession' (Ar. [ħrfa])
- l-bakit_F 'package' (Fr. [pake]_M)
- l-oqt_F 'time' (Ar. [wəqt]_M)
- t^ʕ-t^ʕar^ʕbit 'education (of children)' (Ar. [tər^ʕbija])

The reason for the omnipresence of /l-/ is both diachronic and synchronic. Possibly at one point, Arabic nouns were introduced into Berber as some sort of code-switching, just like a speaker of French nowadays would pronounce English words inside a French sentence, without those words really being an integral part of the language. As cases of code-switching, mainly their phonology was affected; the absence of a prefix was therefore not surprising. With time occurrences of code-switching became general, there was a pressure to integrate such nouns into the language. In order to be integrated, these nouns needed to comply with the requirement for an obligatory prefix position. However, the strangeness of associating these with the regular prefixes persisted. For this reason, the definite article /l/ of Arabic was recruited to occupy the prefixal position and justify the lack of any inflection in it.

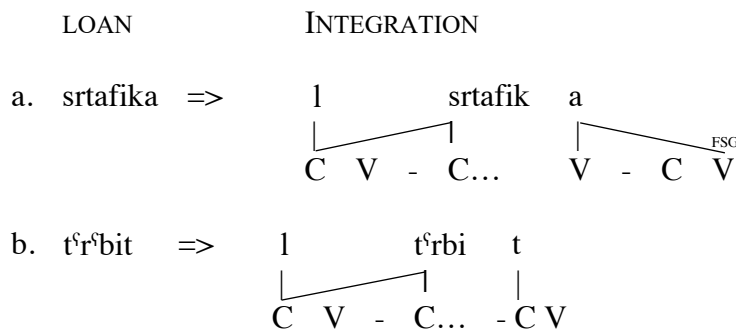
26) loaned nouns - masculine





More technically, it can be assumed that whatever features are present on the inflectional *suffixal* position cannot be copied to the prefixal one, because it is already occupied by /l/. Thus, if the noun ends in /a/ or /t/, these are taken to be the realization of a suffixal position containing the feature +GEN, on analogy with such nouns in the native vocabulary (and, for /a/, in Arabic and Spanish). Since features are not copied onto the prefixal position, no /t/ will be inserted.

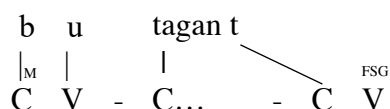
27) loaned nouns - feminine



Note the important difference between this prefixal /l/ and the stem-initial non-thematic vowel of native nouns (22 above), which is not identifiable as a prefix and therefore allows the realization of the copied +FM feature [t-urf-a] ‘F-alliance-F’.

Finally, we would like to comment on the other configuration that consistently lacks prefixes, namely compounds. We submit that it lacks a prefix for the same reason as nouns with the prefix /l/: /bu/ occupies the same type of prefixal position as /l/ and the native prefixes, as in (28):

28) Compound noun [butagant] ‘boar’ ([t-agan-t] ‘F-forest-F’)



To be clear, we do not claim that /bu/ competes for the *same* prefixal position as the prefixes of the non-head N. Indeed, as mentioned, the non-head noun can carry all of the regular prefixal markers, such as the gender [t-] in (28), as well as /l/, e.g. [bu-l-χ^wdʳʳ-t] ‘he of the vegetables (vegetable vendor)’. Rather, we contend that the CV occupied by /bu/ belongs to the head noun. In this sense, the head noun consists solely of a prefixal position: the structure of a [bu]-compound is [CV_{-head} [CV_{-base}]_{modN}]_{headN}. Further evidence for this proposal is provided in the next subsection, where we consider evaluative morphology.

The analysis of [bu/mmu] as heads points to an interesting relation between the prefixal position and the base. In section 2, we explained that [bu] serves as the head of [butagant] ‘boar’, and therefore the noun is masculine even though [t-agna-t] ‘F-forest-F’ is feminine (as shown in (28)). However, (28) positions this head in the same type of prefixal CV as /l/ and the regular prefixes. Are these items also the heads of their nouns?

Again, we answer this question with the analogy to Romance languages. Is the first [ə] in Portuguese [ə kazə] ‘the house’ the head of the phrase? Indeed it is. [ə kazə] is a full DP, and

the determiner *is* the head of the DP, even though the features it realizes come from its base (+DEF is unrealized in this case). Similarly, the prefixal position in both [a-funas] ‘FS-bovine’ and [l-kamjun] ‘truck’ heads the noun. When possible, features from the base are realized in this head position. We’ve seen that in /l-kamjun/ it is not possible by assumption. Compounds like [bu-tagant] illustrate another scenario: the item occupying the head position has features of its own – in this case M - and so those of the base are not copied into the position it occupies.

To summarize, this subsection examined the two cases of C-initial nouns: loans and compounds. Both the ubiquity of the prefix /l/ in loans and the lack of prefixes in such nouns and in [bu]-compounds were explained in a unified fashion, by assuming that /l/ and /bu/ occupy the obligatory prefixal position. The next subsection provides further evidence for our analysis from two domains: **i.** variation and **ii.** nouns which are more complex morphologically.

3.3 Further evidence for the prefixal site and feature copying

3.3.1 variation

The first piece of evidence in favor of our analysis comes from variation. We have proposed (section 2.2) that the existence of variation between [l-mus^sib-t]_F and [l-mus^sib-a]_F ‘catastrophe-F’ supports the analysis of final [a] being perceived as a gender marker. The more general feminine marker [-t] replaces the [-a], rather than being concatenated to it – it is another exponent for the same feature. Similarly, although most loaned nouns begin with [l], there are some items for which one finds variation between [l] and the regular set of prefixes (29). In stark contrast, there is no noun in which /l/ and /a/ are combined: forms like *[la-br^shuʃ] are unattested. These facts support our view of /l/ as an alternative to native prefixes, occupying the same position as the prefix in native nouns. We will comment on the feminine forms in (29) below.⁷

29) Loans beginning with V_{th} rather than /l/ ⁸

M		F	
l-br ^s huʃ ~ a-br ^s huʃ	‘teenager’	t-a-br ^s huʃ-t	‘teenager.DIM’
l-brrad ~ a-brrad	‘teapot’	t-a-brrad-t	‘teapot.DIM’
l-bs ^s t ^s am ~ a-bs ^s t ^s am	‘wallet’	t-a-bs ^s t ^s am-t	‘wallet.DIM’
l-qndil ~ a-qndil	‘oil lamp’	t-a-qndil-t	‘oil lamp.DIM’

Interestingly, there is even a domain in which nouns with loaned bases *must* appear without their initial /l/: agentive nouns. Several agentive nouns are derived in the template FʃʃaL (F,ʃ,L standing for consonants), which takes the regular native affixes.⁹ When such a noun is derived from a loan, the initial /l/ of that loan is replaced – rather than joined – by the regular prefixes of the language. Again, we interpret this fact as pointing to /l/ occupying the same position that elsewhere hosts native prefixes.

⁷ There are also cases where prefix [l-] appears in free variation with /t+a/: e.g. [l-mdin-t] / [t-a-mdin-t] ‘town’. This, again, clearly supports the claim that /l-/ and /t-a-/ compete for the prefixal position, as well as the claim that the right edge of the stem (suffix) is the more basic, canonical locus of gender.

⁸ Some if not all of the feminine forms of the type listed in this section table may also appear with [l-] preceded by [a-], e.g. [t-a-l-brrad-t], [t-a-l-bs^st^sam-t]. See the next subsection 3.3.2.

⁹ The template is itself a loan from Arabic Faʃʃa:L; but as the lack of a prefix [l] shows, it is not perceived as such.

30) Agentive nouns in FɣɣaL, derived from loans with initial /l/

LOAN BASE		M		F
[l-χdm-t]	‘work’	[a-χddam]	‘worker’	[t-a-χddam-t]
[l-ksib-t]	‘livestock’	[a-kssab]	‘livestock owner’	[t-a-kssab-t]
[l-bni]	‘construction’	[a-bnnaj]	‘builder’	[t-a-bnnaj-t]
[l-kri]	‘rent’	[a-krraj]	‘renter’	[t-a-krraj-t]

In both (29) and (30) one finds feminine derivatives of the masculine items without the /l/. These illustrate how, if the /l/ does *not* block the realization of features in the prefixal position, feminine features can also be realized there.

There is nevertheless one domain in which the regular prefixal morphology *can* be combined with /l/: evaluative morphology.

3.3.2 Evaluative morphology

Augmentative and diminutive nouns are productively derived from nominal bases that allow for it (see Chaker 1998, Dell & Elmedlaoui 2002: 26, Kossmann 2014; Mettouchi 1999, and Iazzi 2018: 838). A basic feminine noun can be stripped off its feminine markers to acquire an augmentative meaning, e.g. [t-a-kur-t] ‘F-FS-ball-F’ => [a-kur] ‘FS-big ball’. Inversely, a basic masculine noun can be diminutivized by *adding* the feminine markers, e.g. [a-fus] ‘hand’ ‘M.FS-hand’ => [t-a-fuss-t] ‘F-FS-little hand-F’

Now consider augmentatives and diminutives based on loans with an initial /l/ in (31). Such nouns regularly keep their prefix /l/. This /l/ is preceded by a vowel [a], identical to the thematic vowel previously discussed.¹⁰ Regardless of the gender of the base, and in accordance with the above generalizations, the derived augmentative form is masculine, and the derived diminutive is feminine. All feminine bases of augmentatives lose their gender suffix [-t] or [-a] (31a); and all the masculine bases of diminutives come to be marked with [t] on both edges in the diminutive (31b).

31) Augmentatives from bases with initial /l/

	<i>Loan</i>	<i>Augmentative</i>	<i>Diminutive</i>	
a. F	l-χnf-t	a-l-χnf	t-a-l-χnf-t	‘bag’
	l-bakit	a-l-bakit	t-a-l-bakit-t	‘pack’
	l-br ^ɕ wet ^ɕ a	a-l-br ^ɕ wet ^ɕ	t-a-l-br ^ɕ wet ^ɕ -t ^ɕ	‘wheelbarrow’
b. M	l-muss	a-l-muss	t-a-l-muss-t	‘knife’
	l-kamjun	a-l-kamjun	t-a-l-kamjun-t	‘truck’
	l-gar ^ɕ aʒ ^ɕ	a-l-gar ^ɕ aʒ ^ɕ	t-a-l-gar ^ɕ aʒ ^ɕ -t	‘garage’
	l-brmil	a-l-brmil	t-a-l-brmil-t	‘barrel’

At first sight, the data in (31) seem to argue against our analysis, in that they combine the regular prefixes with /l/. In fact, they *support* our view. Our account predicts that /l/ and the regular prefixes may not share the *same* prefixal CV: as mentioned, no [l-a-] or [l-u] prefixes should be attested. The data in (31) do not contradict this prediction. Rather, they point to a process of “thematization” in evaluative morphology. For reasons that needn’t concern us here, the formation of diminutives and augmentatives entails the addition of another prefixal position, *before* that of /l/ (much like the [bu]-compound in (28) above). Features copied from the base

¹⁰ Whether this vowel behaves like a V_{th} or an initial stem vowel is subject to inter-dialectal variation (Dell & Elmedlaoui 2002: 36).

can then be realized in this position, as they are in the diminutive. Thus, our claim that feature realization is blocked by /l/ finds further support: once there is another position before /l/, copied features will be realized in that position.

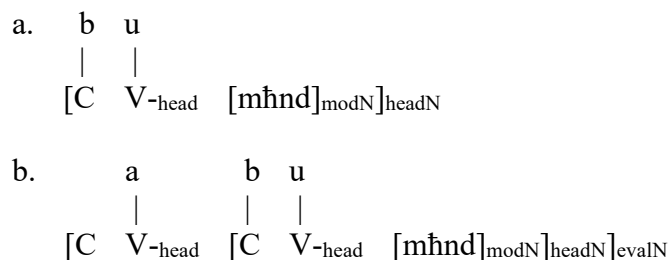
Evaluative morphology also applies to non-compositional (non-human) compound nouns, as the following examples illustrate:

32) Augmentatives and diminutives of [bu]-nouns

<i>bu+N</i>	<i>Augmentative</i>	<i>Diminutive</i>	
bu-ttgra	a-bu-ttgra	t-a-bu-ttgra-t	‘turtle’
bu-sskka	a-bu-sskka	t-a-bu-sskka-t	‘cobra’
bu-mḥnd	a-bu-mḥnd	t-a-bu-mḥnd-t	‘hedgehog’
bu-ʒʒɪlɪl	a-bu-ʒʒɪlɪl	t-a-bu-ʒʒɪlɪl-t	‘snail’
bu-t-lmsa	a-bu-t-lmsa	t-a-bu-t-lmsa	‘woodpecker’

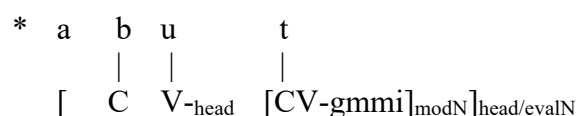
We have analyzed such [bu]-compounds as in (33a). The structure of an augmented compound is given in (33b). Importantly, the evaluative head is external to the entire [bu] compound which it modifies. This is in accordance with the non-compositional semantics of the base: [bu] and its complement are semantically cohesive, they function as a sole unit, and therefore they can be modified as a whole.

33) Structure of augmented [bu] compound



The kind of analysis in (33) may also explain why [bu]-compounds referring to human beings – which also happen to be compositional – reject evaluative morphology. Suppose that because [bu-tgm̄mi] ‘home owner’ is compositional and does not function as a cohesively as the compounds in (32), in order to modify it the evaluative head must be internal to the head noun, rather than external to the entire compound as in (33b). In other words, in order to say “big home-owner”, one must modify “owner” but not “home-owner”. Above, we’ve claimed that /bu/ occupies the prefixal position of its domain. Yet it is precisely this prefixal position that is necessary for the evaluative morphology. Thus, as illustrated graphically in (34), the internal modification of only the head of a [bu]-compound is impossible for the same reason that no basic [bu] compound ever carries a prefix: there is no space for further prefixation.

34) The impossibility of internally augmenting [bu] compound



Of course, a full account of [bu]-compounds falls beyond the scope of the present paper. Nevertheless, we hope to have shown that if we are on the right track, and [bu] occupies the

same type of obligatory prefixal CV as other prefixes, at least one of the limitations of evaluative morphology on compounds may be understood. This, too, we believe, renders further support to our proposal.

4. Conclusion

In this paper, we examined the marking of grammatical gender in Berber. The distribution of gender markers in the different noun types turned out to serve as a window to the structure of Berber nouns in general. Our exploration resulted in two (related) conclusions:

- 35) Two conclusions
- a. All Berber nouns involve a prefixal position.
 - b. The canonical position of gender inflection is to the right of the nominal base.

Thus, the structure of a Berber noun is similar to that of a Romance Article+Noun in several respects, with two crucial differences, again undoubtedly related. First, in Berber, the prefix is obligatory; and second, the Berber prefix denotes state, not definiteness.

The two conclusions in (35) were shown to underlie a veritable host of facts about the nominal morphology of the language. Chief among these were **i.** the otherwise extremely peculiar absence of consonant-initial, non-thematic stems; **ii.** the surprising ubiquity of a prefix /l/ in borrowed nouns; and **iii.** the odd lack of [tC]-initial feminine nouns in the citation form (the FS). Also accounted for are the absence of prefixes (outside those of evaluative morphology) before [l-] and the compound head [bu-], and the marking of gender at the right edge with vowels rather than [t].

The analysis raises an equally large host of questions. Some of these concern Berber languages other than Tashlhiyt. For instance, in the Tamazight variety described in Kossmann (2014), some native nouns lack an overt FS prefix, e.g. [fus] ‘hand’ for Tashlhiyt [a-fus]. Similarly, in the Tamashek language described in Heath (2005) some feminine nouns may end with geminate consonants other than [t], e.g. [t-ælaq:] ‘mud.SG’ (p. 167); this is impossible in Tashlhiyt. Other questions yet can be asked about the implications of the analysis within the Tashlhiyt system, concerning, for instance, number marking on augmentatives, diminutives, loans and compounds, and the interaction of such marking with gender. While we intend to answer some of these questions ourselves in future studies, we hope to have provided the grounds on which other linguists can build extensions to other phenomena and languages.

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