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Asymmetric inflection in Berber: the view from gender

Noam Faust & Mohamed Lahrouchi

Abstract: In Tashlhiyt Berber nouns, grammatical gender is usually expressed on both edges of the noun by the segment /t/. However, at the right edge, there is another, more minor pattern: many grammatically feminine nouns end in a vowel. The regular realization involves a final /t/ associated to a suffixal CV unit. Vowel-final feminine nouns are derived when a final stem vowel is associated to the V position of the suffix, blocking the association of the /t/. This right-edge effect is a mirror-image of Bendjaballah’s (2011) analysis of the left-edge inflection of vowel-initial stems. The distribution of gender marking in loans provides further supports to our analysis.

Keywords: Berber, 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 (1), masculine grammatical gender can be described as having no overt marker; feminine grammatical gender is most often marked in the singular forms by two [t]s, one on each extremity of the stem (giving the impression of a circumfix).¹

(1) Equi-radical M-F nouns

MSG		FSG	
afruχ	‘boy’	t-afruχ-t	‘girl’
afunas	‘ox’	t-afunas-t	‘cow’
azʼalim	‘onion (coll.)’	t-azʼalim-t	‘onion (sing)’
aʼalim	‘reed’	t-aʼalim-t	‘fishing rod’
iskr	‘fingernail’	t-iskr-t	‘garlic’

Almost all studies of Berber morphology focus on the inflectional material at the left edge of the noun, where not only gender, but also state/case and number can be marked. Less attention has been devoted in published work to gender inflection at the *right* edge of the noun. We are aware only of Bendjaballah & Haiden (2008: 45-50) who posit a final site in which [θ] (the Kabyle equivalent of Tashlhiyt [t]) is realized in the singular. Idrissi (2000: 109) also provides a nominal template with a final position for gender, but does not discuss this issue any further. In general, when the topic of gender inflection on the right edge is discussed, the literature mentions mainly t-final feminine nouns.

Yet there is also an important group of feminine nouns which are not t-final; all of these nouns are vowel-final:

¹Unless stated otherwise, 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 languages.

(2) Feminine SG nouns with a prefix /t-/ but no suffix /-t/ – always V-final

- | | | | | | | | | |
|----|--------|--------|----|---------|--------------|----|---------|----------|
| a. | t-awda | ‘fear’ | d. | t-ala | ‘small hill’ | g. | t-assmi | ‘needle’ |
| b. | t-urfa | ‘ally’ | e. | t-ijmi | ‘sauce’ | h. | t-ili | ‘ewe’ |
| c. | t-amda | ‘pond’ | f. | t-aguni | ‘sleep’ | i. | t-izi | ‘period’ |

With some very specific exceptions, there are no singular feminine nouns in Tashlhiyt 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 either by a suffix /-t/ or by a final vowel. In other words, there are *no* feminine nouns whose right edge is not marked for gender.

Looking now at both edges, one may generalize that *all* native feminine nouns exhibit restrictions, but the restrictions are not symmetric: the left edge carries a marker /t/, while the right edge ends either with a /t/ or with a vowel. In this paper, we explore this asymmetry. We propose that it results from the existence of an obligatory site for gender inflection at the right edge of the noun. This final site may host either /t/ or a vowel. This choice may appear to be lexically-determined, but it is not. We will argue that the realization of /t/ in the final site is as grammatically predictable as it is on the left side of the noun: it is realized when no stem material invades the final site, as we claim happens in the examples in (2). In addition to this claim, we show that unlike t-final nouns, the items in (2) lack a masculine counterpart. We submit that this is due to templatic considerations: the masculine would not provide the space needed for the realization of the final vowel.² We provide further support for this analysis from loans, where gender is marked only at the right edge.

The paper is structured as follows. Section 2 deals with gender inflection at both edges of the noun. It presents the data more fully, including loanwords. It also outlines previous analyses of inflection at the left edge, among which the analysis of stem-initial vowels as invading the inflectional site (Bendjaballah 2011). Our own analysis is set out in section 3. We demonstrate how the possibility for vocalic marking of gender at the right edge constitutes a mirror image of the analysis proposed by Bendjaballah (2011): the final vowel of a stem can occupy the gender position, blocking the association of the regular exponent /t/. The absence of a masculine counterpart for vowel-final feminine nouns is accounted for. We then return to loans, and show how these exhibit variation between both options – a final vowel or /t/ – thus supporting our analysis. We also provide an interpretation of the blocking of inflection, including gender inflection, on the left edge of loans. Section 4 concludes the paper.

2. Gender inflection at both edges: data and previous studies

2.1 Inflection at the left edge

As shown in (3), the left edge of the noun hosts not only gender inflection, but also state/case and number (see Guerssel 1992, Ouhalla 1996, Ennaji 2001, Bendjaballah 2011, Bendjaballah & Haiden 2008, Lahrouchi 2011, 2013, Shlonsky 2014, Ben Si Said 2020, among others). Free State (FS) and Construct State (CS) refer to the state/case inflection.

² On this view, the two [t]’s in the F.SG forms in (1) are not part of a circumfix. They are realized in two distinct positions: one is dedicated only to gender, the other may host several grammatical exponents, including case, number and gender. Indeed, standard binary-branching syntactic analysis (Kayne 1984) predicts that of the two /t/’s only one should belong to the same domain as the root; that is, a form like [t-afunas-t] ‘cow’ can only be [t[[afunas][t]]] or [[[t][afunas]]t], but not [t[afunas]t].

(3) Gender, number and state alternations at the left edge

	SG				PL			
	FS		CS		FS		CS	
	M	F	M	F	M	F	M	F
'boy/girl'	a-frux	ta-frux-t	u-frux	t-frux-t	i-frux-an	ti-frux-in	i-frux-an	t-frux-in
'ox/cow'	a-funas	ta-funas-t	u-funas	t-funas-t	i-funas-n	ti-funas-in	i-funas-n	t-funas-in
'chicken'	a-fullus	ta-fullus-t	u-fullus	t-fullus-t	i-fullus-n	ti-fullus-in	i-fullus-n	t-fullus-in
'pigeon'	a-tbir	ta-tbir-t	u-tbir	t-tbir-t	i-tbir-n	ti-tbir-in	i-tbir-n	t-tbir-in

Beginning with the FS, number inflection is expressed at the left edge by the alternation between a- in the SG and i- in the PL. Gender is expressed by F t-. In the CS, M.SG a- alternates with u-, but PL i- remains unaltered. F forms of both numbers, in contrast, display only gender t-. Table (4) summarizes the distribution of the prefixes.

(4) The distribution of nominal prefixes

	SG		PL	
	M	F	M	F
FS	a-	t-a-	i-	t-i-
CS	u-	t-	i-	t-

Alongside this general system, some nouns show a stable initial vowel, which does not change throughout the inflection of the noun. Plural marking is then simply absent from the left edge; in the CS, instead of being replaced by [u], the stable vowel is preceded by its consonantal variant [w]. The examples in (5), taken from Dell & Jebbour (1991), compare a noun with a stable initial vowel (5b) with a regular noun (5a). We will refer to such vowels as “stem-initial”.

(5) Prefixal vs. stem-initial vowel (Dell & Jebbour 1991: 124)

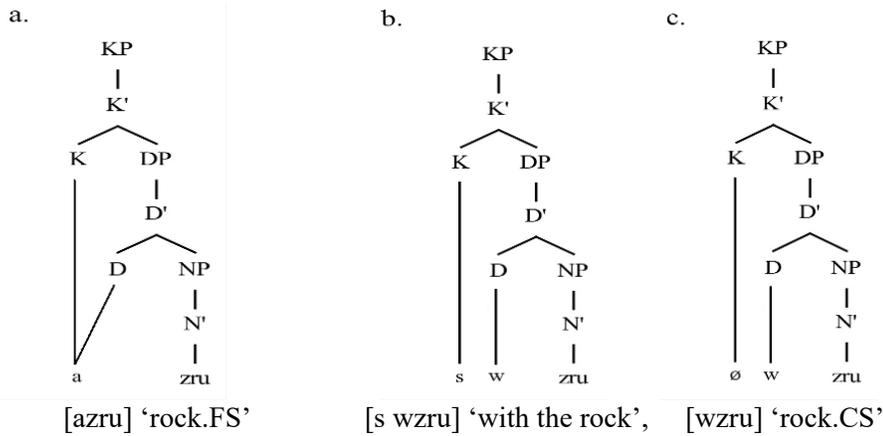
		SG	PL
a. 'rag, strip'	FS	a-dʒar	i-dʒar-n
	CS	u-dʒar	i-dʒar-n
b. 'widower'	FS	adgal	adgal-n
	CS	w-adgal	w-adgal-n

The existence of such nouns and their analysis in previous work will play an important role in our own account. The following section outlines previous treatments of the facts.

2.2. Previous analyses

Guerssel (1987, 1992) analyzes the prefixal [a] as a kind of “portmanteau” morpheme which realizes two functional heads, D(eterminer) and K(ase) (6a). This contrasts with the CS initial [w], which realizes only D while K is expressed either by a preposition (6b) or by a null exponent (6c). On this view, the initial site is complex: it realizes two distinct syntactic heads.

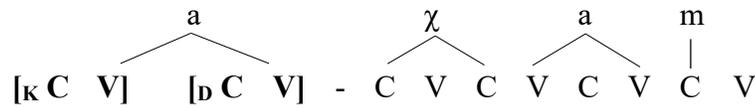
(6) Kase, Determiner exponents (Guerssel 1987, 1992)



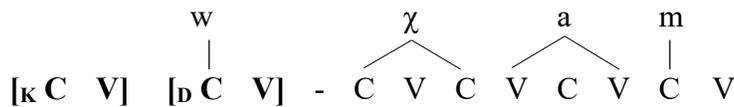
This stance is further developed in Bendjaballah & Haiden (2008), in their account of the nominal inflection of Kabyle. According to these authors, each syntactic head corresponds to a syllabic space: the CV unit of Strict CV (Lowenstamm 1996, Scheer 2004). The resulting complex (in bold in 7) is added to a nominal template. In the FS, the whole template is filled (7a), while in the CS the outer CV remains empty (7b). Following Lowenstamm (1991), peripheral vowels are analyzed as underlyingly long.

(7) M.SG

a. FS: [aχχam] 'house'



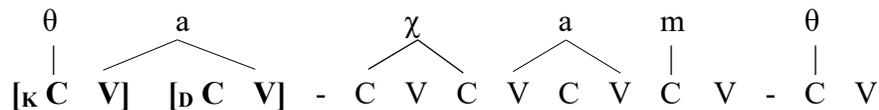
b. CS: [wəχχam]



As for the F marker (regularly [θ-] in Kabyle), the authors submit that it is associated to the outer CV in the FS form (8a), but to the inner CV in the CS (8b). The latter claim correlates with the absence of the CS marker.³

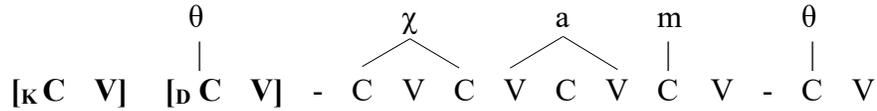
(8) F.SG

a. FS: [θaχχamθ] 'room'



³ In a study of similar facts in Tashlhiyt, Lahrouchi (2013) motivates the selection of F t- over CS u- through the lower morphosyntactic position of the former.

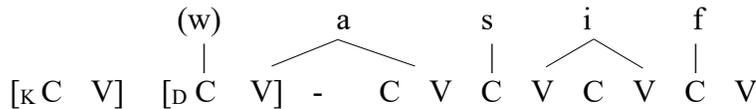
b. CS: [θəχχamθ]



Note that in both (7b) and (8b), when a consonant is associated with the inner CV, the outer CV is inaccessible. We will return to this fact in the analysis of gender marking in loanwords in section 3.3.

Of particular importance to the present analysis is the treatment of stem-initial vowels in Bendjaballah (2011). As all vowels, these also require two V-slots. However, the lexical template only provides them with one. As a result, it is claimed, they have to branch onto the V-slot of [D CV], as in (9). For this reason, no other vowel can occupy the two prefixal V-slots, blocking for example the realization of PL /i-/.

(9) A stem vowel occupying part of the initial site: [asif] ‘river’ (CS [wasif])



Having examined the inflection at the left edge of native words, and their analysis in previous work, we now address a less-studied phenomenon, namely loanwords.

2.3 Loanwords

Tashlhiyt loans (from Arabic or other languages) invariably display an [l] at the left edge of the noun, as shown in (10).

(10) Prefix /l-/ in loanwords

- | | |
|---|--|
| a. l-banju | ‘bathtub’ (Sp. [baɲo]) |
| l-bar ^s aʒ ^s | ‘dam’ (Fr. [baʁaʒ]) |
| l-as ^s l | ‘ancestry’ (Ar. [as ^s l]) |
| l ^s -or ^s dinatur | ‘computer’ (Fr. [ɔʁdinatœʁ]) |
| l-adris | ‘address’ (Fr. [adʁes]) |
| b. l-kuzina | ‘kitchen’ (Sp. [kosina]) |
| l-mus ^s ibt~l-mus ^s iba | ‘catastrophe’ (Ar. [mus ^s iba]) |
| l-ħrft~l-ħrfa | ‘profession’ (Ar. [ħrfa]) |
| l-bakit _F | ‘package’ (Fr. [pake] _M) |
| l-oqt _F | ‘time’ (Ar. [wəqt] _M) |
| l ^s -anba | ‘lamp’ (Sp. [lampa]) |

This consonant, which originates in the Arabic definite article, crucially blocks all other inflection. That is, there are no number, state or gender markers on the left edge of loans. Thus, in the paradigms of the M and F loans in (11a,b), there are no markers other than /l/ at the left edge, cf. (11c).

- | | | | |
|---------------------------|----|----------|-------------|
| (11) | | SG | PL |
| a. ‘bathtub’ _M | FS | l-banju | l-banju-wat |
| | CS | l-banju | l-banju-wat |
| b. ‘kitchen’ _F | FS | l-kuzina | l-kuzin-at |

	CS	l-kuzina	l-kuzin-at
c. 'boy'	FS	a-fruχ	i-fruχ-an
	CS	u-fruχ	i-fruχ-an

Dell & Elmedlaoui (2002:35-6) provide several reasons to analyze the initial consonant in loanwords as 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.

In the case of stem-initial vowels in (9) above, templatic reasons (i.e. space limitation) accounted for the absence of some markers from the left edge of the noun. The same logic can be used to account for the complete absence of inflection at the left edge of loanwords. Specifically for gender (11b), the presence of /l/ can be regarded as blocking the realization of the prefix /t-/.

That is not to say that loanwords do not carry gender inflection at the *right* edge. Indeed, as shown in (10b) above, the presence of /a/ or /t/ at the right edge of the loaned noun makes it grammatically feminine, even if that noun is masculine in the source language. We will return to this below.

2.4 Gender inflection at the right edge

In Tashlhiyt, like in other Berber varieties, nouns may end either in a consonant or in a vowel. Unlike masculine nouns, feminine nouns are restricted with regard to the nature of the segment that appears in the final position.

2.4.1 C-final nouns

When masculine, a noun may display any type of consonant at the stem-final position. The corresponding feminine involves both a prefix /t-/ and suffix /-t/. Examples are repeated from (1).

(12) Equi-radical M-F with C-final stems

MSG		FSG	
afruχ	'boy'	t-afruχ-t	'girl'
afunas	'ox'	t-afunas-t	'cow'
azʕalim	'onion (coll.)'	t-azʕalim-t	'onion (sing)'
aʕalim	'reed'	t-aʕalim-t	'fishing rod'
iskr	'fingernail'	t-iskr-t	'garlic'

A feminine singular noun may end in a consonant only if this consonant is /t/ and it is suffixal. All other C-final singulars are systematically interpreted as masculine. This stands in sharp contrast to V-final nouns.

2.4.2 V-final nouns

Unsuffixed V-final nouns can be either masculine (13a) or feminine (13b).

(13) Masculine and feminine nouns with V-final stems and no suffix

a. MSG		b. FSG	
isli	'groom'	t-urfa	'ally'
azuknni	'thyme'	t-aguni	'sleep'
ifili	'string'	t-awda	'fear'
aga	'bucket'	t-azzla	'running'
aʕzri	'teenager'	t-igmmi	'house'

The V-final feminine nouns in (13b) do not have corresponding masculine forms. In contrast, when a V-final noun is masculine, a feminine counterpart can be formed, again with a suffix /-t/ (as well as a prefix /t-/). The masculine nouns in (13a) above are repeated beneath, along with their feminine counterparts.

(14) Equi-radical M-F with V-final stems

MSG		FSG	
isli	‘groom’	t-isli-t	‘bride’
azuknni	‘thyme’	t-azuknni-t	‘oregano’
ifili	‘string’	t-ifili-t	‘necklace’
aʒzri	‘teenager’	t-aʒzri-t	‘teenager (f)’

Three generalizations can be made about the data with respect to the right edge. First, there is an asymmetry between unsuffixed C-final nouns and unsuffixed V-final nouns: the former can only be masculine, whereas the latter can be either masculine or feminine. Second, when an unsuffixed noun is both V-final and feminine, it does not require the gender marking found elsewhere, namely a suffix /-t/. This fact might be taken to suggest that there is more than one feminine suffix in the language: alongside /t/, /a/ and /i/ may also mark feminine gender at the right edge. However, the third generalization about the data casts doubt on this view. While both masculine and feminine nouns can be V-final, there is an intriguing asymmetry between them. Masculine nouns ending in a vowel very often have a feminine counterpart, always with the suffix /-t/, but feminine nouns ending in a vowel *never* have a masculine counterpart without that vowel, contrary to what would be expected if that vowel were a suffix.

Before we continue, it is important to refute the following interpretation of the data. Since all native feminine nouns carry a prefix /t-/, one may jump to the conclusion that this exponent suffices in order to mark a noun as feminine. The only gender marking in (13b) would then be the prefix. However, such a view leads to a fundamental misprediction, namely that feminine nouns should be able to end in a consonant other than /t/ as long as they carry a prefix /t-/. *There are no such nouns in Tashlhiyt Berber.* Marking of feminine gender obligatorily involves the right edge.

In the ensuing analysis we will propose that all feminine nouns, including those ending in a vowel, are in fact suffixed. They involve a final site, which can be identified either by a stem vowel or, by default, by a suffix /-t/. Thus, forms like (13b) are in fact suffixed, with the suffixal position being identified by the final vowel, rather than [t]. In other words, while the stem-final vowel in (13b) is not a suffix, it occupies a suffixal position. The proposal also produces the absence of feminine nouns among unsuffixed, C-final nouns, as well as the absence of masculine counterparts to V-final feminine ones.

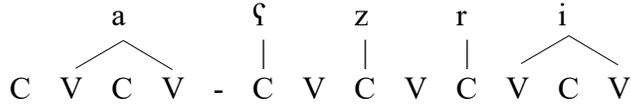
3. Analysis

In this section, we apply principles from Bendjaballah & Haiden (2008) and Bendjaballah (2011) to gender inflection at the right edge.

3.1. Basic cases

In (15,16), we present a M-F, V-final pair in the FS.SG. Since the final vowel is present in the M form (15), its bi-positional templatic support must be part of the lexical representation. The F noun, we submit, is formed by suffixing an additional position (16). The lexical template provides the two slots necessary for the realization of the stem-final vowel, and the suffix /-t/ is associated to the final, “gender” CV.

(15) M.SG V-final nouns: [aʕzri] ‘teenager.M’



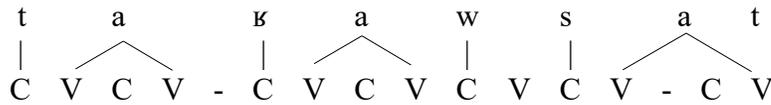
(16) Corresponding F form: [taʕzrit] ‘teenager.F’



However, as we have seen in (9) above, not all base vowels are provided with the 2 slots necessary for their realization by the lexical template. Generalizing from the left edge to both edges, one can glean the following prediction: at the right edge, too, a final vowel can straddle the lexical and inflectional parts of the template.

This, we submit, is what occurs in V-final feminine nouns such as [taɣawsa] ‘object, thing’. As shown in (17), a stem-final /a/ can be taken to straddle the base’s final position and the final inflectional position, making the association of the final /t/ marker impossible and yielding a vowel-final feminine noun.

(17) Stem-final vowel invading feminine site, blocking /-t/



The scenario in (17) is very much the right-edge analogue of Bendjaballah’s analysis of stem-initial vowels at the left edge. In both cases, a non-affixal element comes to occupy an inflectional position, thereby obviating the inflectional marker. At the left edge, the stem vowel can never block the feminine /t/ (whose position is available regardless, see (9) above); but at the right edge, the spreading of the stem-final vowel is predicted to block the regular association of /t/ to the inflectional suffixal position.

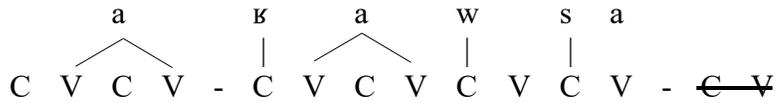
Since feminine gender is expounded by the material to the left of the hyphen in (16,17), feminine nouns are expected to end either with the feminine /t/ or with a vowel. If there is no stem-final vowel to occupy the V-slot of the suffix as in (17), the feminine /t/ will occupy it. Thus, the absence of feminine nouns ending in consonants other than /t/ is correctly predicted.

In the next subsection, we show how our proposal also predicts the systematic absence of masculine counterparts to V-final feminine nouns.

3.2. Stem right-alignment

We have seen in (15,16) above how M-F pairs are created when a masculine noun ends with a vowel. Why is there no M counterpart to V-final feminine nouns? To answer this question, consider what such a counterpart would look like in (18). Crucially, the final vowel of the stem will have to remain unrealized, because the absence of a suffixal position leaves it with only one position to associate to.

(18) Illicit masculine counterpart of a V-final feminine



To explain the impossibility of (18), we adopt the following principle from Faust (2022):

(19) Stem right-alignment⁴

A non-final segment of the stem must not be domain-final

The representation in (18) violates this principle: the /s/, a non-final stem element, is word final.

Importantly, the principle in (19) is motivated independently within the language. Consider once again the representation of [taɾawsa] ‘object, thing’ in (17) above. Why does the stem vowel spread to block the suffixal /t/? Why is it not the other ways around, namely that the regular realization [t] should block the spreading of the vowel, to yield *[taɾaws-t]? We have hitherto not provided a reason for the preference of the stem-final vowel over the general marker /t/ in satisfying the additional templatic space of the gender exponent. The principle in (19) does exactly that: for /t/ to block the spreading of the vowel would constitute a violation of (19), because the non-final /s/ would end up as the stem-final segment.

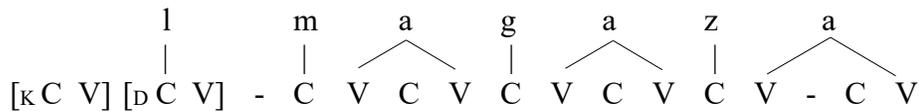
To summarize, the stem right-alignment principle explains not only the absence of masculine counterpart to V-final feminine nouns, but also the distribution of /t/ *versus* stem-vowel in marking feminine nouns.

3.3. Support from loans

As shown above, the obligatoriness of gender marking at the right edge is also true of loanwords. In these, too, feminine nouns are either V-final or [t]-final.

Interestingly, sometimes loans with original masculine gender become feminine because they are vowel final: [lpartma]_F ‘apartment’ [lɪmagaza]_F ‘store’ (both M in French). This fact seems to follow from our analysis, if one assumes that the final vowel is taken to occupy a final inflectional gender CV.

(20) Representation of [lɪmagaza] ‘store’



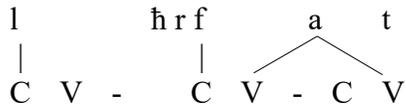
As will be recalled -/l/ blocks all inflection at the *left* edge. The representation above can be understood as motivating this blocking effect. We remarked in section 2.2 that when the inner CV is occupied by a consonant, no other marker can surface. Assuming, as in (20), that /l/ occupies the inner CV, all other markers, be they CS u-, F t-, or the number exponents a- and i- are predicted to be illicit. The following representations of loanwords therefore do not include the outer CV of the initial site.⁵

⁴ This principle is used by Faust to account for lack of template satisfaction, or the use of extra-radical material, in items based on /j/-final roots in many Semitic languages – see original paper for details. The principle is nevertheless not universal: indeed, language like French violate it with pairs like [fɪʁ, fɪʁj] ‘chilly (M,F)’, wherein the root-final [j] occurs in the feminine but not in the masculine. But such languages are the exception, not the rule.

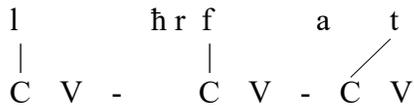
⁵ Since this paper is not about inflection at the left edge, we refrain from a more elaborate explanation of the blocking effect. Possibly, Guerssel’s “ø” in (6c) implies not only the absence of a segmental exponent, but also the non-insertion of a CV unit in the CS. This view of the CS can be extended to loans and underlie the blocking of any cumulative

As previously mentioned (10b), within the same domain of loanwords, one sometimes finds *variation* between a final vowel and /t/. We take this as support for our templatic analysis of their complementary distribution: if the final vowel occupies the gender -CV, the /t/ cannot do so (21), and vice versa (22).

(21) Vowel-final feminine loan [lhrfa] ‘job



(22) Same noun, [t]-final: /a/ cannot associate, only one position



With respect to stem right-alignment, (21) and (22) represent two analyses of the final /a/ of the noun. In (21), it is analyzed as part of the stem, thereby blocking the /t/. In (22), it is regarded as a suffix (as it is in Arabic, the main donor language). As such, it cannot occupy the last two V slots because this would entail the violation the stem-right alignment principle (19); the association of /t/ solves this problem.

To summarize, the consideration of loans is important for our general proposal in two ways. First, loans illustrate how final vowels can be taken as evidence for a gender position at the right edge, and how, when this position is occupied by /t/, such a vowel cannot surface. Second, they demonstrate the independence of the final gender marking from the initial one: even when a prefix /t-/ cannot be realized, a suffixal gender CV is still required.

4. Conclusion

In this paper we discussed singular gender marking in Berber. Beginning with regular nouns such as [t-a-funas-t] ‘cow’, we noted that an identical gender marker /t/ can appear on both edges. In other items, however, the marking is not symmetric. Some native nouns of feminine grammatical gender can display /t/ on the left edge, but a vowel at the right edge. Loans of feminine gender, in turn, never exhibit *any* inflection on the left edge, whereas their right edge can also carry either a vocalic marker or a /t/.

Since marking on the right edge is true of nearly all nouns of feminine gender, we assumed, following previous studies, that there is an obligatory gender position at the right edge. In more formal terms, the gender feature is always realized as additional templatic space (and the segmental suffix /-t/). We accounted for the availability of the two options at the right edge as a case of templatic invasion: when the final vowel of the stem does not have the templatic support necessary for its realization, it occupies the additional templatic space, thereby blocking the regular realization of /-t/. This templatic invasion is the mirror image of the configuration proposed by Bedjaballah (2011) for the left-edge inflection of nominal stems beginning with a vowel. Finally, the priority of the stem vowel over the final /-t/ is dictated by the stem right-alignment principle, which also accounts for the lack of masculine counterparts for vowel-final feminine nouns.

Taking a step back, this paper joins previous work on Berber in emphasizing the importance of templatic considerations. The templatic space for both stems and grammatical markers may be insufficient,

inflection in both scenarios. The reader is referred to Ben Si Said (2020) who claims that the alternation of the initial vowel in nouns can be analyzed without resort to an affixal templatic position for case.

resulting in the blocking of several markers in various configurations. In this paper, we have shown how it leads to asymmetric gender inflection: always /t/ at the left edge, /t/ or a stem vowel at the right edge.

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