

In (3c,d) the final u must be an inflectional element, since it is not present when another inflectional ending is present, as in the feminine (compare [fatu] in (3c), fem. [fáta] with [fátu] 'fatuous' fem. (fátua), or in derivatives (compare [numaru] in (3d), and [numeral] 'numeral' with [razidu] 'residue' and [rezidual] 'residual'). I will return to the distinction between (3d) and (3d') later.

Let's assume that the rules in (2) are Chomsky-adjunctions. Gender Spelling will apply to the morphologically inflected root [prím]+N,-F,+P to give the form [prímz], with the appropriate morphological structure, as shown in (4). E represents a phonologically null morphological element.⁷

(4) a. [prím]
+N,-F,+P

b. $\begin{array}{l} +N,-F,+P \\ \swarrow \quad \searrow \\ \text{[prím]} \quad \text{[E]} \\ \swarrow \quad \searrow \\ +N,-F,+P \quad -F \end{array}$

c. $\begin{array}{l} +N,-F,+P \\ \swarrow \quad \searrow \\ \text{[prím]} \quad \text{[E]} \\ \swarrow \quad \searrow \\ +N,-F,+P \quad -F \\ \swarrow \quad \searrow \\ \text{[z]} \\ +P \end{array}$

The unmarked cases, like the adjective in (4), or the nouns tap (masc.) and casa lexically with the bare root [táp]_{-F}, [káz]_{+F}, but the marked cases, like [fám] (fem.) and [súru] (masc.) will have something that distinguishes them lexically from the unmarked cases. I propose that their special character is due to the fact that their lexical representation is a gender inflected form similar to the derived ones in (4b,c). I will modify the representation of the masc. [súru] directly. Compare the representations of [fám] and [súru] (a) to those of [fáma] 'fame' and [súf] 'South' (b) (I omit morphological structure not directly relevant):

(5) a. $\begin{array}{l} \text{[[fám][E]]} \\ +F \quad +F \\ \text{[[súr][u]]} \\ +F \quad -F \end{array}$ b. $\begin{array}{l} \text{[fám]} \\ +F \\ \text{[súf]} \\ -F \end{array}$ c. $\begin{array}{l} \text{[[fám][a]]} \\ +F \quad +F \\ \text{[[súf][E]]} \\ F \quad -F \end{array}$

Gender Spelling will not be able to apply to these forms (5a) which have their gender marker already expanded. Variable adjectives (1a) will be distinguished in the same way from invariable adjectives like those in (3a). Compare the fem.-masc. pairs tòtla - tòtil 'stupid' (variable) and útil - útil 'useful' (invariable):

(6) $\begin{array}{l} \text{[tótli]}_F \\ \text{[tótli]}_F \end{array}$

Gender Spelling $\begin{array}{l} \text{[[tótli][ø]]} \\ +F \quad +F \\ \text{[[tótli][E]]} \\ -F \quad -F \end{array}$

$\begin{array}{l} \text{[utli][E]} \\ +F \quad +F \\ \text{[utli][E]} \\ -F \quad +F \end{array}$

Gender Spelling -----

But the adjectives in (3c) pose a problem. They are not invariable, they show different final vowels in masc. and fem. forms: [fóndu] - [fónda], [fófu] - [fófa], [mru] - [mra] (and their plurals [fóndus] - [fóndas], etc.). Phonetically a final u alternates in masc. forms with a final ø in the fem. They should have, on the other hand, their masc. gender marker u in their underlying form, according to our analysis. Since we cannot derive the fem. form, from the masc., we would need another form for the fem. But a single form for both masc. and fem. is necessary, since they should be an instance of Gender Spelling, being completely regular forms: there is not a single case of an adjective with a masc. form ending in inflective u that alternates with a fem. ending in anything other than ø. And if we are right in assigning the same complexity to invariables (3a) and nominals with masc. forms in u (3c), we should not have one underlying form ([[fína][E]]) in the first case, and two underlying forms ([[fónd][u]], [fónd]_F in the second case.

There is a simple solution to this problem. Let's assume that the rule that spells out the fem. marker inserts just a V slot. The marked forms in (3) will be represented lexically with their gender markers, namely [E], for invariables and feminines with no gender vowel, and [V] for nominals whose masculine ends in inflective u. V will be interpreted as the unmarked vowel, namely ø. The masc. inflectional vowel will be distinguished from the fem. by a rule that specifies it as u. Gender Spelling will have the following revised form:

(7) GENDER SPELLING

a. $\emptyset \text{ ---} \rightarrow \text{[V] / [X]}_{+N,+F}$

- b. \emptyset ----> [E]/ [X]
 +N,+F
- c. \emptyset ----> [u]/
 [V]
 -F

Now adjectives with u - \emptyset alternation can be represented lexically in their gender inflected form, but just with the V slot in the gender marker position. The rule that assigns u to masc. gender vowels will yield the final masc. u and the (universal) convention that spells V as \emptyset in the unmarked case will give the \emptyset of the feminine.

- (8) fònd
 [[CVCC][V]]
 -F -F-F
- fònd
 [[CVCC][V]]
 +F +F +F
- (7c) fònd u
 [[CVCC][V]]
 -F -F -F
-
- fònd \emptyset
 [[CVCC][V]]
 +F +F +F
- Un. Conv. -----

Summing up, a vowel is the regular marker of feminines (rule (7a)), no vowel marks masculines (rule (7b)). In case there is an exceptional masc. vowel, it is the high back vowel (rule (7c)). Unmarked cases consist, underlyingly, of the bare root (4a); Gender Spelling, in particular (7a,b), supplies the appropriate morphological structure, namely \emptyset , to fem. and E to masc. Exceptionally, underlying structures might contain specifications overriding the regularities expressed in (7). Thus the more marked, but still common cases in (3) have V or E underlyingly.

Rule (7c), which introduces u, differentiates the marked cases in the masc. from those in the fem., when a vowel is lexically present, whereas marked cases in which E is present instead of V have the same fem. and masc. surface form.

- (9) diana fem. 'bull's eye' piano masc. 'piano'
 [dián]
 +F [[pián][V]]
 -F -F -F
- (7) [[dián][\emptyset]] [[pián][u]]
 +F -F +F -F -F -F

- final fem. 'final' final masc. 'end'
 [[final][E]] [[final]]
 +F +F +F -F
-
- [[final][E]]
 -F -F -F

4. There is a third class of nominals which is still more restricted. In this class masculines end in a vowel which is not \emptyset , and feminines end in a vowel which is not \emptyset . Since the gender vowel is always unstressed and the unstressed vowel system consists of \emptyset , i and u, the final vowel in this class could be \emptyset or i in the masc., and i in the fem.⁸

Let's examine first the masc. ending in \emptyset . In some cases the \emptyset is epenthetic (10a), but in other cases it is clearly not (10c):

- (10) a. pusip \emptyset b. *Xpl c. unánim \emptyset d. magnánim
 'possible' 'unanimous' 'magnanimous'
- dígn \emptyset *Xgn epát \emptyset empát \emptyset
 'dign' 'Apache' 'indigestion'
- sógr \emptyset *Xgr páp \emptyset páp
 'envelope' 'pope' 'gizzard'
- ákt \emptyset *Xkt pérs \emptyset bérs
 'act' 'Persian' 'verse'
- mágn \emptyset *Xgm puét \emptyset puét
 'magna' 'poet' 'well' dimin.

(10b) indicates the inexistence of words ending in [p], [m], etc. For other consonants, or consonant clusters, however final position is possible (10d). [ákt \emptyset] will be /ákt/ underlyingly, and \emptyset will be inserted. [unánim \emptyset], on the other hand, will be underlyingly /unánima/ (or an equivalent form) with the final \emptyset in the root and no gender marker. There is some reason to believe that this \emptyset is an inflection marker, since it is not present before derivational suffixes:

- (11) a. unánim \emptyset unanimitat 'unanimity'
 séks \emptyset 'sex' seksizm \emptyset 'sexism'
 epát \emptyset epát \emptyset t 'Apache' dim.
 páp \emptyset papal 'papa'
 pérs \emptyset pérsik 'Persian'

- b. magnánim 'own' adj.
 máfks 'Marx'
 ampát 'flu'
 gríp 'Corsican'
 kafs 'Corsican'

I am assuming however that the @ is radical, and that it is truncated before another vowel. The conditions are similar to the deletion across words, where identical vowels or @ in contact with another vowel delete under certain conditions.⁹ Here are other examples of root vowel truncation in derivatives:

- (12) a. pr'p'i 'own' adj. əprupjə 'acquire'
 dibr'si 'divorce' dibr'sjə 'to divorce'
 ʎəngwə10 'tongue' ʎəngw'ɛə 'tongue' augment.
 dúas 'two' fem. duál 'dual'
 b. pr'im 'thin' əprimá 'to thin'
 prugrés 'progress' prugrasá 'to progress'
 k'ntəs 'fifth' 'k'ntá 'quintal'
 k'ntəp'ljə 'quintuple'

In (12a) are roots ending in [i]_h or [w]_h, which stay before a derivational suffix beginning with a different vowel ([á]. [ɛt(ə)]), but disappear before an identical vowel (third column).⁹ (12b) contains examples of consonant final roots with which the suffixes always show up with their initial vowel.

The cases of exceptional inflectional vowel thus reduce to i in the masc. and i, u in the fem. The following list contains most of them:

(13) a. Masculines

- munisj'pi 'country'
 pr'insj'pi 'beginning'
 ak'libr'i 'equilibrium'
 ak'lj'ps'i 'eclipse'
 big'ɔ'ti 'moustache'
 trəp'ézi 'trapeze'
 petr'ɔ'li 'petroleum'
 urán'i 'uranium'

b. Feminines

- | | | | |
|-------------|--------------|----------|--------------|
| parafraz'i | 'paraphrase' | tr'ibu | 'tribe' |
| dj'səzi | 'diocese' | 1'bidu | 'libido' |
| dzi | 'dose' | rədj'u | 'radio' |
| asklar'ɔ'zi | 'sclerosis' | dinam'u | 'dynamo' |
| | | suprənu | 'soprano' |
| | | magn'etu | 'magneto' |
| | | f'otu | 'photograph' |
| | | m'otu | 'motorcycle' |

In all these cases a particular vowel is attached to the V slot that is specified in the lexical representation of the word. Thus the exceptional character of the nominals in this class is due to their "gender inflected" underlying status. Recall that that was also the case in the preceding class, but the latter had a specified V slot, whereas for the former we posit a particular specification for the vowel in addition to the V slot, thus capturing the difference in marking. (14) displays the phonetic form and the underlying form of examples of the unmarked class, the less marked class, and the exceptional class:

- (14)
- | | | |
|--------------------|---------------------------------|-----------------------------|
| | <u>Masculine</u> | <u>Feminine</u> |
| <u>Unmarked</u> | ám 'hook'
[ám] _{-F} | fámə
[fám] _{+F} |
| <u>Marked</u> | ánu
ám | fámə
fám |
| <u>Exceptional</u> | big'ti
big't i | rədj'u
rədj |
| | [[VC][V]] _{-F} | [[CVC][E]] _{+F} |
| | [[CVCVC][V]] _{-F} | [[CVC][V]] _{+F} |

In the unmarked class, [ám] and [fám] will get their regular inflective markers E and @, respectively, by Gender Spelling (7). In the marked class the segmentally identical examples, like all other examples in (3), will have the inflective marker present as V or E, V being spelled out by (7) as [u]. Notice that the reverse specification would be possible, namely a -F as E, and a +F as V, but this would give as a result the unmarked case, for which no marker is necessary underlyingly. Finally, in the exceptional class in addition to the V, a particular vowel is present underlyingly, thus preventing (7) from applying at all to these examples as well as to the rest of the examples in (13).

5. The analysis just outlined covers regular nominal inflection. Let's now consider it in the light of other cases of inflection and word formation.

The most clear case where plurals are not just singulars plus the marker z involves oxytone masculine nominals ending in sibilant or sibilant plus stop. Thus compare the regular prim in (a) to the examples in (b):

(15)	Sg.		Pl.
	a.	<u>prim</u>	<u>prims</u>
	b.	<u>rús</u>	<u>rúsus</u>
		<u>més</u>	<u>mésus</u>
		<u>fiuŋ</u>	<u>fiuŋus</u>
		<u>mitŋ</u>	<u>míddʒus</u>
		<u>despátŋ</u>	<u>despátʒus</u>
		<u>bʃtŋ</u>	<u>bʒus</u>
		<u>test</u>	<u>téstus</u>
		<u>disk</u>	<u>diskus</u>

I will not be concerned here with the regular phonological alternations affecting the final consonant of the root. What is interesting about these cases is that they involve an environment of vowel insertion, but the inserted vowel is not the usual one, @. Two sibilants across word boundaries or in compounding assimilate regressively and then merge (16a). In inflection, however, @ is inserted between them:

(16)	a.	<u>trés</u>	<u>sáks</u>	<u>trésáks</u>
		<u>bátŋ</u>	<u>ʃwíá</u>	<u>bátʃwíá</u>
		<u>dis</u>	<u>ʒún</u>	<u>dizún</u>
		<u>mitŋ</u>	<u>ʒorn</u>	<u>míddʒorn</u>
	b.	<u>dúrnis</u>	<u>Pres. subj., 2sg.</u>	<u>dúrnis</u>
		<u>báts</u>		<u>pres. ind., 2 sg.</u>
				<u>báts</u>

b.	<u>fúʒis</u>	'flee'	<u>fúʒas</u>
	<u>kúʒis</u>	'sew'	<u>kúʒas</u>
	<u>kunéʒis</u>	'know'	<u>kunéʒas</u>
	<u>túsis</u>	'cough'	<u>túsas</u>

In (16b) the verbal root is followed by the inflectional ending is in the first column, and by the inflectional ending s in the second. This applies to all verbs except those with root final s, z, ʃ, or ʒ. For these (16b'), endings are added without change in the root normally, but before s an epenthetic @ is inserted.

If we allow V insertion to apply freely between sibilants (or sibilant-stop cluster plus sibilant), it will insert a V in the examples in (15b) (masc. pl. inflection) and (16b') (verbal inflection). The first example in (15b) and the last of (16c') will have the following structure:

(17)	a.	<u>rús</u>	<u>s</u>	b.	<u>tús</u>	<u>s</u>
		[[[CVG]]][V][C]]	-F		[[[CVG]]][V][C]]	-F

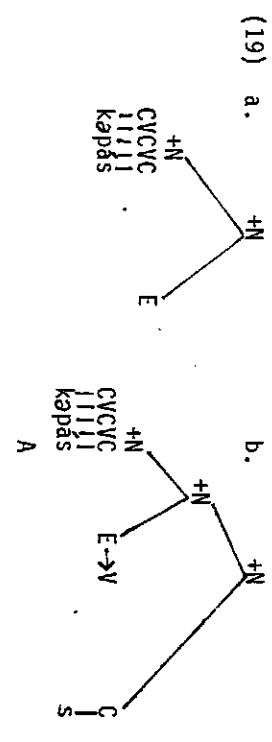
(17a) will be subject to Gender Spelling, in particular to (7c) which will attach a u to the empty V slot, whereas the V in (17b) will not be subject to the rule and will be interpreted as @. The separation of the processes of "V spelling" and "u spelling" formalized in (7) that were motivated by the distribution of inflectional vowels, allows us to give a satisfactory account of the appearance of u in @ insertion environments.

This solution can also be tested with another set of cases. Adjectives like [rús] have masc. pl. [rúsus], as we have seen, and regular fem. [rúsa] with nonproblematic pl. [rúsas]. But what happens when an adjective ending in sibilant or sibilant plus stop is invariable? Compare the invariable capag 'capable' with escàs 'scarce' which is variable and ends in a sibilant, and fiscal 'fiscal' which is variable but doesn't end in a sibilant.

(18)	Masc. sg.	Fem. sg.	Masc. pl.	Fem. pl.
	<u>fiskál</u>	<u>fiskál</u>	<u>fiskáls</u>	<u>fiskáls</u>
	<u>kapás</u>	<u>kapás</u>	<u>kapásus</u>	<u>kapásas</u>
	<u>askàs</u>	<u>askàsə</u>	<u>askásus</u>	<u>askásas</u>

Fiscal being invariable, it will have the structure [[fiskál][E]] which will prevent Gender Spelling from inserting a vowel in the feminine forms. Escàs is parallel to rús in its masc. forms: vowel epenthesis inserts V which is spelled out by (7) as u. Now capag will have to have the structure [[kəpás][E]], like fiscal

[[fiská]] [E]], both being invariables. But vowel insertion, being a phonological rule, will apply to the plural of *capac*, making it variable phonetically. I will assume, given these facts, that the morphological processes of Gender Spelling cannot apply to an already "spelled out" structure like (19a), but phonological processes will be able to insert an element in the null position:



(7c) will apply after V-epenthesis like in the other cases and [[kápás][E]][s]] will become [kápásus] if masc. and [kápásis] if fem.

Another piece of evidence in favor of this analysis of inflective vowels has to do with word formation. A desinential vowel appears often at the end of the first element of the complex word. In nominals it can be, exceptionally, the feminine marker, as in deadjectival manner adverbs in -ment:

(20) Adjective (masc.) Adjective (fem.) Derived adverb

n <u>ov</u>	'new'	n <u>ov</u> a	'new'	n <u>ov</u> am <u>en</u>
astr <u>u</u>	'astral'	astr <u>u</u> a	'astral'	astr <u>u</u> am <u>en</u>
an <u>al</u>	'anal'	an <u>al</u> a	'anal'	an <u>al</u> am <u>en</u>
akt <u>u</u>	'actual'	akt <u>u</u> a	'actual'	akt <u>u</u> am <u>en</u>

But normally the morphologically unmarked form is required. If derivation or compounding don't require a vowel after the stem, the bare stem appears even if the masculine gender-inflected form has a vowel:

(21) prím 'thin' prímim superl.

infáma 'infamous' infámim superl.

gút 'glass' gútet dimin.

bigúti 'moustache' bigútet dimin.

But in other cases the suffix requires a vowel to appear before it; in these cases the inflection marker appears on the root (23). Given our analysis, if the morphologically unmarked form, namely masc. sg., is required, and a vowel is also required by the suffix, we will expect the less marked masc. vowel to appear, namely u.

It is rare that stressed suffixes require a vowel. The only case that is reasonably uncontroversial is the deadjectival nominal suffix which has the allophones -dat and -tat. Both can appear after stems with no final vowel added, or with @, and -tat can also appear after the stem followed by i:

(22)

má	'bad'	mádat	'badness'
igwá	'equal'	igwátat	'equality'
sék	'dry'	sékadát	'dryness'
askás	'scarce'	askesatát	'scarcity'
útil	'useful'	utilítat	'helpfulness'

But there is a class of derivational suffixes that normally begin with a consonant and require a vowel on the stem:

(23) a. -graf əsanugrafik 'scenographic'

aséna 'scene'

léksikugrafik 'lexicographic'

léksik 'vocabulary'

-log fənumanlujía 'phenomenology'

fənumen 'phenomenon'

metudulujía 'methodology'

metuda 'method'

Cases that take a vowel different from u, or no vowel exist, but they are very restricted (trilujía 'trilogy', kərníbur 'carnivorous').

Finally, another case where a desinential vowel is required by a specific morphological configuration is found in compounds like anglo-francès físico-matemàtic [lànglufrensés], [fíziku~~matemàtik~~]. Whereas similar types of compounds do not require a vowel (sudest 'southeast', sord-mut 'deaf-mute'), when this particular compound structure requires a vowel, it is the unexpected unmarked masc. vowel u.

7. The three types of nominals, unmarked, marked, and exceptional are thus distinguished by their underlying forms. Unmarked nominals will have their "gender" spelled out by the regular process of Gender Spelling (7): a vowel is inserted in the fem.; the underlying form will consist just of the root (and morphological class features). On the other hand, marked nominals will have slightly more complex underlying representations. The inflective suffix will be present, either as a phonologically empty node for the fem., or as a V slot in the masc. The representations in the unmarked and in the marked class are thus reversed: masculines have the form of feminines (except for the feature F, of course), and conversely. The empty node will surface empty in both marked and unmarked classes; rule (7c), however, will distinguish masc. from fem., by spelling out an unspecified vowel as u if it has the

feature [-F]. We have finally the exceptional class with fully specified inflectional markers in underlying representation. The analysis can also be extended, as argued in sections 5 and 6, to cases where a V slot appears for independent reasons (phonological or morphological). In these cases the V is spelled out as u if it is masc., and e in case it is fem. or has no gender feature at all.

FOOTNOTES

¹As pointed out for Spanish by Harris (1983:115-116, 1984) other elements can also function as inflectional markers. He cites -is, -es, -os, -s as in dosís, diabetes, caos, tóra[ks]. See also fn. 8.

²"Class marker" is the term used by Harris (1984).

³u needs only to have the specifications [-back, -low], other features being supplied by vowel reduction; see Mascard (1978).

⁴The phonetic [s] in the plural is the result of finally devoicing an underlying /z/.

⁵See Wheeler (1979: 2-8) for an early generative analysis, and Mascard (forthcoming, section 40) for discussion.

⁶In the phonetic transcriptions I don't distinguish between the spirant and stop variants of b, d, g.

⁷Morphological constituent structure makes it possible to distinguish a root from a stem with a "zero morpheme", e.g., (4a) from (4b). Notice also that [pr^{im}]_{+N,-F,-P} is notationally equivalent to +N,-F,-P.

pr^{im}

⁸As pointed out before (fn. 1) markers which don't consist of a single vowel belong also to this class. Mascard (forthcoming, section 40) gives the following examples (the second example in each pair is a derivative which shows that the missing final segment is inflective). -is: brindís 'toast', -brindar 'to toast', glotís 'glottis', -glotal 'glotal', cutís 'skin' - cutani 'cutaneous'; -us: porús 'pore', -porós 'porous', anus 'anus' - anal 'anal'; -s: bilis 'bile', -biliar 'biliary', temps 'time' - temporal 'temporal', fons 'bottom' - fonament 'base'.

⁹See Wheeler (1979: 287-294) and Mascard (1984: 205-206).

¹⁰I am assuming that [w] is represented as a segmental "u"

¹¹See Mascardó (forthcoming, section 32) for a descriptive analysis.

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