On the role of loanwords in the analysis of Norwegian stress and quantity

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Abstract

The prosody of a prototypical Norwegian word is characterized by the following properties: (i) it is disyllabic, (ii) the initial syllable is bimoraic and stressed, and (iii) the final syllable is monomoraic and unstressed (Kristoffersen 2000). The weight of the initial syllable can be realized either with a long vowel or by closing the syllable, e.g. with a geminate. Norwegian words can also be monosyllabic, having either a final geminate (*hatt* 'hat'), a final singleton (*hat* 'hatred'), or a final open syllable (*se* 'see'). Stress can be assigned to such a word by constructing a trochee at either edge of the word, and indeed both analyses have been advocated (Rice 2003, Kristoffersen 2003).

The stress patterns of loanwords, however, reveal additional details about the assignment of stress, and sort out some unresolvable ambiguities arising when just considering the native vocabulary. These facts form the basis for advocating a right-edge oriented analysis of stress in Norwegian.

Of particular interest here, however, are two patterns revealed in the disyllabic loans with final stress. Loanwords with final stress can preserve their final stress in Norwegian, even though no native words have this pattern. I claim here that such loans with final closed syllables (e.g. *trafikk*, *tomát*) are able to preserve this pattern because of the parallels between the final syllables of the loans and the native monosyllables.

In contrast with the consonant-final loans, words with final stress on open syllables (*komité, armé, allé*) cannot be generated by the grammar, the existence of monosyllabic words such as *se* notwithstanding. The grammar can never yield stress on a final open

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syllable because NonFinal will force stress off the final syllable if there is another candidate host (i.e. if the word has more than one syllable).

The pattern in this small group of loans is not predicted by the grammar without stipulative intervention. Specifying vowel length is not adequate, sinc the Richness of the Base hypothesis requires that inputs with long vowels in their final syllables be mapped by the grammar onto well-formed outputs. This leaves lexically specified diacritic stress marking as the available strategy. Possible formalizations of this are discussed.

1 Introduction

(1) The native vocabulary of Norwegian does not facilitate an unambiguous determination of syllable structure and the footing algorithm.

(2) Loanwords display patterns not seen in the native vocabulary, and their analysis disambiguates some of the questions about syllabification and foot structure.

(3) Furthermore, an analysis of the loanword patterns, along with the hypothesis of the Richness of the Base distinguish some of the possibilities for treating exceptional stress patterns.

(4) Finally, a scenario regarding the trade-off between diacritic marking and restructuring the grammar is highlighted.

2 Outline

(5)
a. The basic stress patterns on the native vocabulary in Norwegian are introduced in §3, with a discussion of both disyllabic (§3.1) and monosyllabic (§3.2) words. The relationship between stress and quantity is also introduced.[1]
b. The constraints and rankings necessary to model the native patterns are given in §4.
c. The operation of the constraints and rankings are then illustrated with tableaux in §5. Ambiguities in the analysis of both the disyllabic and monosyllabic words are highlighted.
d. These ambiguities will be resolved through a study of the behavior of loanwords, which begins in §6. The data are crucially divided into those with final closed syllables (§6.1) versus those with final open syllables (§6.2).
e. Selected implications and conclusions are presented in §7.

[1]For helpful recent discussion on various aspects of the analysis presented here, I am indebted to Sylvia Blaho, Patrik Bye, Patrick Honeybone, Gjert Kristoffersen, Ove Lorentz, Bruce Morén & Tore Nesset.

3 Stress and quantity I: Native words

3.1 Disyllabic words

(6) Prototypical disyllabic words in Norwegian ...

a. have stress on the initial syllable,
b. have a second syllable which is open,
c. have an initial syllable which either has a long vowel or which is closed, either by the first consonant of a cluster, or by a geminate consonant.

(7) Complementary distribution of V- and C-length in disyllabic words

tape	'to lose'	*tappe*	'to tap'
ripe	'to scratch'	*rippe (opp)*	'to drag (up)'
stripe	'stripe'	*strippe*	'to strip'
mate	'to feed'	*matte*	'mat'
hete	'heat'	*hette*	'hood'
føde	'to give birth'	*fødde*	'to feed, pret.'
glede	'to make glad'	*gledde*	'to make glad, pret.'
lade	'to load'	*ladde*	'to fill, pret.'
bane	'field, lane'	*banne*	'to swear'
rene	'clean'	*renne*	'gutter'
mine	'mine'	*minne*	'to remind'
bule	'bump, swelling'	*bulle*	'(papal) bull'
pile	'to move quickly'	*pille*	'to finger'
hele	'to heal'	*helle*	'to slant'
mure	'to make a wall'	*murre*	'ache'
hake	'chin'	*hakke*	'pick'
rake	'rake'	*rakke*	'dog'
reke	'shrimp'	*rekke*	'line'
breke	'bleat'	*brekke*	'big hill'
bleke	'to bleach'	*blekke*	'newspaper (slang)'
kube	'cube'	*kubbe*	'log'
same	'a Saami person'	*samme*	'same'
grime	'harness'	*grimme*	'ugly, pl.'
klase	'bunch of fruit or flowers'	*klasse*	'class'
buse	'to barge in'	*busse*	'kind of ship'
lise	'pain relief'	*lisse*	'shoe lace'
suge	'to suck'	*sugge*	'sow'
ruge	'to brood'	*rugge*	'to rock'

(8) A grammar delivering exactly these forms as grammatical must ...

a. place stress on the initial syllable, and
b. insure that the stressed syllable is heavy.
c. NB: Stress on the initial syllable could be achieved in an OT analysis either

through alignment of stress with the left edge of the word or through alignment at the right edge of the word, with the accompanying requirement that stress be nonfinal.

3.2 Monosyllabic words

(9) Prototypical monosyllabic words in Norwegian ...

a. have a long vowel followed by a single consonant, or
b. have a short vowels followed by either two consonants or a geminate.

(10) Complementary distribution of V- and C-length in monosyllabic words[2]

hat	'hatred'	*hatt*	'hat'
tak	'ceiling'	*takk*	'thanks'
rap	'burp'	*rapp*	'kind of grass'
råd	'advice'	*rådd*	'advise, part.'
vis	'manner'	*viss*	'certain'
vad	'ford (in a river)'	*vadd*	'to wade, part.'
stek	'steak'	*stekk*	'to clip wings, imp.'
skjøt	'joint'	*skjøtt*	'to splice, pret.'
pur	'pure'	*purr*	'to remind, imp.'
lut	'lut'	*lutt*	'lute'
eg	'I'	*egg*	'egg'
ren	'clean'	*renn*	'ski competition'
stab	'staff'	*stabb*	'to walk heavily, imp.'
steg	'step'	*stegg*	'male quail'

(11) A grammar which delivers exactly these options ...

a. place stress on the lone syllable,
b. insure that a vowel followed only by a singleton C is long, and that other vowels are not.
c. NB: The final C could be outside the syllable. This would make the stressed syllable like the stressed syllables in the disyllabic forms. In fact, this structure is preferred in the analysis given below, given the relative satisfaction of NonFinal.

[2]The claim that the vowels in these pairs of monosyllabic words vary in length is uncontroversial. In addition to being particularly salient impressionistically, research has shown that it is precisely the variation in vowel length which cues speaker judgments for word identification (Behne, Czigler & Sullivan 1998a). Speakers are less attuned to contrasts in consonant length in word-final position. Nonetheless, the length difference is reliably present (Behne, Czigler & Sullivan 1998b).

4 Constraints and rankings

4.1 Constraints

(12) NonFinality: The prosodic head of the word does not fall on the word final syllable (Prince & Smolensky 1993:42).
Prince & Smolensky define the prosodic head as the syllable bearing main stress. The constraint is therefore understood here to mean that the right edge of the stressed syllable does not coincide with the right edge of the word.

(13) Align(HPrWd, R, PrWd,R): For every head of a prosodic word (syllable bearing main stress), there is a prosodic word such that the right edge of the head of the prosodic word coincides with the right edge of the prosodic word (Prince & Smolensky 1993).[3]

(14) NoCoda: A syllable does not have a coda. (Prince & Smolensky 1993:93)

(15) FootBinarity: A foot is binary at the level of the syllable or the mora (Prince & Smolensky 1993).

(16) MaxLink-(μ)[seg]: For two corresponding segments, if S_1 is associated to a mora, then S_2 is associated to a mora. (Morén 1999/2001).

4.2 Rankings

(17) MaxLink-(μ)[seg] $\gg$ NoCoda[4]

(18) NonFinality $\gg$ AlignR

(19) FootBinarity $\gg$ MaxLink-(μ)[seg]

(20) NonFinality $\gg$ MaxLink-(μ)[seg]

5 Tableaux for native patterns

(21) A disyllabic input with a final open syllable will surface with stress on the initial syllable, and with a lengthened vowel if the intervocalic consonant in the input is not specified as moraic.

[3]It is well-established that stress in earlier stages of Germanic is initial, suggesting the relative high ranking of an alignment constraint pushing the head of the prosodic word towards the left edge. With words of one or two syllables, the difference between building a trochee at the left edge vs. building one at the right edge cannot be discerned. With the loanwords, however, I argue that stress must be towards the right edge of the word, cf. Rice (1999).

[4]This ranking has the effect of preserving a moraic consonant as moraic, even at the cost of having a coda. Using Morén's (1999) formalism is crucial here, since the possibility of changing the association of a mora (e.g. from a consonant to a vowel) would allow Max in the traditional sense to be satisfied, while NoCoda also is satisfied. The effect of this in Norwegian would be that stressed syllables always have long vowels and never are closed by geminates.

	$ha_{\mu}ke_{\mu}$	StW	WtS	FtBn	NonF	MaxL_{μ}	NoCoda	AR
a.	$(há_{\mu}.)ke_{\mu}$	*!		*				*
b.	$(ha_{\mu}.ké_{\mu})$	*!			*			
c.	$(há_{\mu}.ke_{\mu})$	*!			*			*
d.	$(há_{\mu}k_{\mu}.)ke_{\mu\mu}$		*!				*	*
e.	$ha_{\mu}k_{\mu}.(ké_{\mu\mu})$		*!		*		*	
f.	$(há_{\mu\mu}k_{\mu}.)ke_{\mu}$			*!			*	*
g.	$(há_{\mu}k_{\mu}.)ke_{\mu}$						*!	*
h.	$(há_{\mu\mu}.)(kè_{\mu\mu})$				*!			*
☞ i.	$(há_{\mu\mu}.)ke_{\mu}$							*

(22) Explication of (21)

a. If the stressed syllable is monomoraic – as in candidates (a), (b), and (c) – the candidate fatally violates Stress-to-Weight.

b. If there is a bimoraic syllable which is not stressed – as in candidates (d) and (e) – the candidate fatally violates Weight-to-Stress.

c. If there is a monomoraic or trimoraic foot – as in candidates (a) and (f) – the candidate (fatally) violates FootBinarity.

d. If a foot coincides with the right edge of the word – as in candidates (b), (c), (e) and (h) – the candidate (fatally) violates NonFinal.

(23) Since markedness constraints are evaluated independent of the input, a tableau with any configuration in the input (e.g. w.r.t. linked morae) will therefore have identical markedness violations. There is only one faithfulness constraint in this (fragment of the) grammar – MaxL(μ). This means that candidates incurring fatal violations "above" MaxL(μ) will never be optimal. When MaxL(μ) fails to distinguish candidates (g) and (i), then (i) will be optimal. When MaxL(μ) does distinguish candidates (g) and (i) in favor of (g), then (g)'s violation of NoCoda becomes irrelevant to its selection as optimal. This gtrammar thereby tolerates the hypothesis of the Richness of the Base and delivers one of two well-formed outputs ((g) or (i)), regardless of the input.

(24) A disyllabic input with a final open syllable will surface with stress on the initial syllable, and with a geminate consonant if the intervocalic consonant in the input is specified as moraic (and the initial vowel is not specified as bimoraic in the input).

	$ha_\mu k_\mu e_\mu$	StW	WtS	FtBn	NonF	MaxL$_\mu$	NoCoda	AR
	a. $(há_\mu.)ke_\mu$	*!		*		*		*
	b. $(ha_\mu.ké_\mu)$	*!			*	*		
	c. $(há_\mu.ke_\mu)$	*!			*	*		*
	d. $(há_\mu k_\mu.)ke_{\mu\mu}$		*!				*	*
	e. $ha_\mu k_\mu.(ké_{\mu\mu})$		*!		*		*	
	f. $(há_{\mu\mu} k_\mu.)ke_\mu$			*!			*	*
☞	g. $(há_\mu k_\mu.)ke_\mu$						*	*
	h. $(há_{\mu\mu}.)(kè_{\mu\mu})$				*!	*		*
	i. $(há_{\mu\mu}.)ke_\mu$					*!		*

(25) For the surface monosyllables, the optimal output will have a long vowel when the input consonant is not moraic.

	$ha_\mu t$	StW	WtS	FtBn	NonF	MaxL$_\mu$	NoCoda	AR
	a. $(.há_\mu t_\mu.)$				*!	*	*	
	b. $(.há_{\mu\mu} t.)$				*!		*	
☞	c. $(.há_{\mu\mu}.)t$							*
	d. $(.há_\mu t_\mu.)t$						*!	*

(26) NonFinal is violated when a foot coincides with the right edge of the word. This is avoided only by making a final consonant extrasyllabic, e.g. as an onset (either alone, or as an onset to an empty – or catalectic – syllable).

(27) When the input has a monomoraic vowel and a moraic consonant, the vowel in the optimal candidate will be short.[5]

	$ha_\mu t_\mu$	StW	WtS	FtBn	NonF	MaxL$_\mu$	NoCoda	AR
	a. $(.há_\mu t_\mu.)$				*!		*	
	b. $(.há_{\mu\mu} t.)$				*!	*	*	
	c. $(.há_{\mu\mu}.)t$					*!		*
☞	d. $(.há_\mu t_\mu.)t$						*	*

6 Stress and quantity II: Loanwords

(28) Loanwords show shapes and stress patterns not seen in the native vocabulary. The requirement that the stressed syllable be bimoraic is preserved. However, disyllablic words can end with consonants, and these words can have either final or penultimate stress. Both of these options are returned by the grammar, as in §6.1. Borrowings with final open syllables can also have either final stress or penultimate stress. These options are not both delivered unproblematically by the same grammar, as in §6.2.

[5]Here again the difference between Max(μ) and MaxLink(μ) becomes clear: The former would allow 'migration' of a mora on the consonant in the input, such that it could surface on the vowel under the pressure of NoCoda, leading to the optimization of candidate (c).

6.1 Final closed syllables

(29) Disyllabic words with word-final consonants and penultimate stress: *éddik*, 'vinegar'; *sénep*, 'mustard'; *bíson*, 'bison'; *kókos* , 'coconut'; *álbum*, 'album'; *árktis*, 'arctic'; *átlas* , 'atlas' ; *bálsam*, 'balsam'; *bámbus*, 'bamboo'; *básis*, 'foundation'; *bónus*, 'bonus' ; *dóktor*, 'doctor'; *fáktor*, 'factor'; *fénrik*, 'second-lieutenant'; *fókus*, 'focus'; *grátis*, 'free'; *hállik*, 'pimp' ; *húmor*, 'humor'; *kétsjup*, 'ketchup'; *kóbolt* , 'cobolt'; *kónsul*, 'consul'; *krókus*, 'crocus'

(30) Disyllabic words with word-final consonants and final stress: *trafík*, 'traffic'; *parýkk*, 'wig'; *fagótt*, 'bassoon'; *agúrk*, 'cucumber'; *hospíts*, 'hospice'; *korréks*,'correction'; *tomát*; *natúr*, 'nature'; *kondóm*; *París*

(31) Words with final consonant clusters which have stress on a non-final syllable: *klimaks, boraks, larynks, advent, apeks, appendiks, asfalt, biceps, boraks, farynks, Føniks, harpiks, haubits, kobolt, etc.*

(32) These patterns can be derived. Initial stress follows from an input with a moraic consonant or a bimoraic penultimate vowel. Final stress follows from an input with a final moraic consonant.

(33) A tableau in which *éddik* is optimal

	$e_\mu d_\mu i_\mu k$	StW	WtS	FtBn	NonF	MaxL$_\mu$	NoCoda	AR
☞	a. $(é_\mu d_\mu .)di_\mu k$						**	*
	b. $(é_\mu d_\mu .di_\mu k)$			*!	*		**	
	c. $e_\mu(.dí_\mu k_\mu)$				*!	*	*	
	d. $e_\mu(.dí_\mu k_\mu)k$					*!	*	*

(34) A tableau in which *trafík* is optimal

	$tra_\mu fi_\mu k_\mu$	StW	WtS	FtBn	NonF	MaxL$_\mu$	NoCoda	AR
	a. $(trá_\mu f_\mu .)fi_\mu k.$					*!	**	*
	b. $(trá_\mu f_\mu .)fi_\mu .k$					*!	*	**
	c. $(trá_{\mu\mu} .)fi_\mu k.$					*!	*	*
	d. $(trá_{\mu\mu} .)fi_\mu .k$					*!		**
	e. $tra_\mu .(fí_{\mu\mu} k.)$				*!	*	*	
	f. $tra_\mu .(fí_{\mu\mu} .)k$					*!		*
	g. $tra_\mu .(fí_\mu k_\mu .)$				*!		*	
☞	h. $tra_\mu .(fí_\mu k_\mu .)k$						*	*

(35) A tableau in which *bóraks* is optimal

	$bo_{\mu\mu} raks$	StW	WtS	FtBn	NonF	MaxL$_\mu$	NoCoda	AR
☞	a. $(bo_{\mu\mu} .)ra_\mu k.s$						*	**
	b. $bo_{\mu\mu}(ra_\mu k_\mu .)s$		*!				*	*
	c. $bo_\mu(ra_\mu k_\mu .)s$					*!	*	*

6.2 Stress on final open syllables

(36) Words that are borrowed with stress on final open syllables are found in Norwegian. Relevant data include (given accents are in the orthography): *orkidé, obo, agora, akribi, allé, armé, buffet, debut, depot, diskret, filet, gelé, geni, ironi, kafé, kopi, kupé, meny, nivå.*

(37) The grammar of Norwegian as proposed above cannot return stress on a final open syllable (Kristoffersen 2003). The violation of NonFinality will always lead us to prefer penultimate stress – which is indeed the correct result for words which have final open syllables but penultimate stress, as in *bikíni.* There is no final consonant available which – if extrasyllabic – could 'buffer' the superficially final stress.

(38) Tableau for *orkidé*

	$o_\mu rki_\mu de_{\mu\mu}$	StW	WtS	FtBn	NonF	$MaxL_\mu$	NoCoda	AR
a.	$o_\mu rki_\mu(dé_{\mu\mu})$				*!			
☞ b.	$o_\mu r(kí_{\mu\mu})de_\mu$					*		*

(39) For this grammar to return stress on a final open syllable, *ad hoc* intervention is required. This could take the form of marking accent diacritically (e.g. Hammond 1999), with a relatively high ranked constraint requiring faithfulness to the accent. Or it could involve specifying a head in the input, and then having a constraint like Max-head, cf. McCarthy 1995, Alderete 1996.

(40) Another tableau for *orkidé*, now with diacritic accent on the final syllable, and a constraint requiring faithful realization of that accent, Faith($\dot{v}$).

	$o_\mu rki_\mu d\dot{e}_\mu$	Faith($\dot{v}$)	StW	WtS	FtBn	NonF	$MaxL_\mu$	NoCoda	AR
☞ a.	$o_\mu rki_\mu(dé_{\mu\mu})$					*			
b.	$o_\mu r(kí_{\mu\mu})de_\mu$	*!					*		*

7 A concluding question

(41) The alternative to diacritic accent is restructuring the grammar.

(42) If the loanwords introduce patterns in which NonFinality is violated in order to preserve final stress, the grammar might change. Specifically, with a new ranking $MaxL_\mu \gg$ NonFinality, an input with a bimoraic vowel at the right edge with surface with final stress (as would be with reranking in (38)). Of course, this also gives hypothetical *haké* instead of either *hákke* or *háke* (with short and long stressed vowels). But given the existence of *armé*, *ha.ké* should be possible.

(43) The data can be described either through the use of specified structure that has to be respected, or through a restructuring of the grammar. How much data is necessary to compel restructuring? Is 30 words enough?

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