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Some morphological rules for Old High German weak verbs*

Robin Cooper

A large majority of the weak verbs in Germanic (i.e. those that mark the preterite with -d- or -t- and not with an ablaut alternation in the stem vowel) may be viewed as falling into the canonical form

$CV(CV)C_o^2 + \begin{matrix} \bar{V} \\ +\text{theme} \end{matrix}$. Early Germanic possessed at least three classes of verbs whose roots contained a theme-vowel i: class I weak verbs and subclasses of class V and VI strong verbs. It is generally assumed that primitive Germanic class I weak verbs contained i or its reflex throughout all their surface forms. As some evidence for this we show paradigms from Gothic, the earliest Germanic language for which there are monuments other than short inscriptions. The theme vowel i occurs on the surface as i, j or ī (written ei) in every form according to fairly obvious phonological rules. This is shown by the forms in the following examples taken from Wright (1910) § 316f.

- (1) a. nasja 'I save'
 b. nasjis 'you ...'
 c. nasji/ 'he...'
 d. nasjōs 'we(dual)...'
 e. nasjats 'you(du.)...'
 f. nasjam 'we...'
 g. nasji/ 'you...'
 h. nasjand 'they...'
- (2) a. nasida 'I saved'
 b. nasidēs 'you...'
 c. nasida 'he...'
 d. nasidēdu 'we(du.)...'
 e. nasidēduts 'you(du.)...'
 f. nasidēdum 'we...'
 g. nasidēdu/ 'you...'
 h. nasidēdun 'they...'
- (3) nasi/s 'saved' (past part.)

The so-called verba pura where there is no consonant between the stem vowel and thematic i have a paradigm exactly similar to that of nasjan. For example, stōjan 'to judge' has first person singular present stōja, second person stōjis etc. as in (1). Its first person singular preterite is stauida, second person stauidēs etc. as in (2).¹ Verbs with strong stem syllables (i.e. a short vowel followed by at least two consonants or a long vowel followed by at least one consonant) such as huggrjan² 'to hunger' and sōkjan 'to seek' have similar paradigms to nasjan except that ji is realized as ī after a strong syllable.³ This affects three present tense forms as shown in (4).

- (4) a. sōkeis 'you seek'
 b. sōkei/ 'he seeks'
 c. sōkei/ 'you(pl.) seek'

Polysyllables such as glitmunjan 'to shine' pattern the same way as sōkjan.

In Old High German (OHG), in contrast to Gothic, theme i disappears under certain conditions and does not leave a surface trace. It disappears in the past tense of the non-weak syllable stems. This is, not surprisingly, traditionally accounted for by a diachronic rule of syncope (see, for example, Braune/Mitzka (1963) - hereafter referred to as B/M - §66). I shall attempt two synchronic analyses here, one of which includes a rule of i-syncope similar to what has been proposed as the diachronic rule and another which includes a rule of i-epenthesis which to some extent mirrors the rule of i-syncope by inserting i where it would formerly not have been deleted. The i-epenthesis analysis, which depends on a morphological alternation of the presence and absence of thematic i is shown to describe the facts of OHG more adequately. The OHG facts are as follows: the weak-syllable stems maintain i throughout all their preterite forms except for a few exceptional verbs. Thus nerien 'to save' (cognate with Gothic nasjan) has the preterite forms listed in (6).

- (6) a. nerita 'I saved'
 b. neritōs 'you...'
 c. nerita 'he...'
 d. neritum 'we...'
 e. neritut 'you...'
 f. neritun 'they...'

OHG past participles have forms which inflect like adjectives as well as uninflected forms. The examples in (7) show that both noninflected and inflected forms of the past participle of nerien contain i.

- (7) a. ginerit 'saved' (uninflected)
 b. gineritēr (masc. nom. sing.)
 c. ginerites (masc. gen. sing.)
 d. gineritemu (masc. dat. sing.)
 e. gineritan (masc. acc. sing.)

Similar forms exist for such verbs as frummen⁴ 'to fulfill', dennen 'to extend', frewen 'to rejoice', leggen 'to lay', knūssen 'to crush'. In (8) I present first/third sing. pret. forms by way of example.

- (8) a. frumita
 b. denita
 c. frewita
 d. legita
 e. knūsita

Verbs with non-weak syllable stems do not have thematic i in the preterite forms and the inflected past participles but the i appears in the uninflected forms of the past participle. This is illustrated by forms of the verbs hören 'to hear', krūben 'to bend', māhalen 'to vow', sāen 'to sow seeds' and sterken 'to strengthen'.

- (9) a. hörta
 b. gihōrit
 c. gihörter

(10) a. krumbta
b. gikrūmbit
c. gikrumbtēr

(11) a. mahalta
b. gimáhalit
c. gimahaltēr

(12) a. sāta
b. gisāit
c. gisātēr

(13) a. starcta
b. gisterkit
c. gistarctēr

The umlaut alternation in (9)-(12) and the awe alternation in (13) are the results of the two rules in (14).

(14) a. Umlaut
V → [-back] / [+stress] X i, j
b. raising
ǎ → ě / [+stress] C₀ i, j

There are various constraints on the value of C₀ in (14b) which vary from dialect to dialect but which are not pertinent to the present issue. Besides the examples in (9)-(13) the forms in (15) might be cited as justification for these rules.

(15) a. anst 'grace' - ensti (gen./dat.)
b. faru 'I go' - feris 'you go'
c. magad 'maid' - mǎgadi (pl.)

For more detailed discussion see Cooper (in prep.). There is a small sub-class of weak-syllable stems, ending in l or t, which do not always show i in the past tense forms, not even, in the case of those ending in l, in the uninflected past participle (B/M §365 Anm. 3). Such a verb is zellen 'to tell', forms of which are given in (16).

(16) a. zalta 'I/he told'
b. gizalt 'told' (past part. uninflected)
c. gizaltēr (masc. sing. nom.)

Another verb of this sub-class whose stressed syllable ends in t and which therefore does have an i in the uninflected past participle is retten 'to save', examples of which are given in (17).

(17) a. ratta 'I/he saved'
b. giretit 'saved'
c. girattēr (masc. sing. nom.)

It seems that verbs are lexically marked in some way for irregular forms such as (16a), (16b) and (17a) and that different items are marked in different dialects. B/M §362, Anm. 3 note that the attestations of such forms vary according to the lexical item. walta 'I chose' only occurs occasionally and the more common form is welita. Similarly multa 'I crushed' only occurs occasionally besides mülita. In contrast, however, zalta is much more common than zelita and the same is true for salta 'I handed over' as opposed to selita and hulta 'I wrapped' as opposed to hülita. Franck (1909) §192 gives a number of doublets for the author Otfrid (ninth century Rhenish Franconian). Thus we have zalta ~ zelita, qualta 'I tortured' ~ quelita, scütita 'I shook' ~ scutta.

The i-syncope analysis has the rule given in (18).

(18) i-syncope

$$i \rightarrow \emptyset / \left. \begin{array}{c} \left[\begin{array}{c} v \\ -str \end{array} \right] \left. \begin{array}{c} VC_2 \\ VC_0 \\ C_1 \end{array} \right\} \text{-----} +CV$$

This rule, whose complex preceding environment corresponds to what we have referred to as non-weak syllable stems, will delete an i following anything but a stressed weak syllable and beginning with a consonant. This will handle all the regular examples that we have mentioned if we assume that the rule of i-syncope precedes the rules of umlaut and raising. Derivations for forms of each of the relevant types are given in (19) - (23)

(19)	a. <u>ner+i+t+a</u>	b. <u>gi+ner+i+t</u>	c. <u>gi+ner+i+t+er</u>
i-sync.	-----	-----	-----
umlaut	-----	-----	-----
raising	-----	-----	-----
(20)	a. <u>hör+i+t+a</u>	b. <u>gi+hör+i+t</u>	c. <u>gi+hör+i+t+er</u>
i-sync.	<u>hör+\emptyset+t+a</u>	-----	<u>gi+hör+\emptyset+t+er</u>
umlaut	-----	<u>gi+hör+i+t</u>	-----
raising	-----	-----	-----
(21)	a. <u>stark+i+t+a</u>	b. <u>gi+stark+i+t</u>	c. <u>gi+stark+i+t+er</u>
i-sync.	<u>stark+\emptyset+t+a</u>	-----	<u>gi+stark+\emptyset+t+er</u>
umlaut	-----	<u>gi+stärk+i+t</u>	-----
raising	-----	<u>gi+sterk+i+t</u>	-----
(22)	a. <u>mahal+i+t+a</u>	b. <u>gi+mahal+i+t</u>	c. <u>gi+mahal+i+t+er</u>
i-sync.	<u>mahal+\emptyset+t+a</u>	-----	<u>gi+mahal+\emptyset+t+er</u>
umlaut	-----	<u>gi+mähal+i+t</u>	-----
raising	-----	-----	-----

(23)	a.	<u>sā+i+t+a</u>	b.	<u>gi+sā+i+t</u>	c.	<u>gi+sā+i+t+ēr</u>
	i-syncope.	sā+∅+t+a		-----		gi+sā+∅+t+ēr
	umlaut	-----		gi+sā̄+i+t		-----
	raising	-----		-----		-----

i-syncope cannot apply in any of the derivations in (19) because the i follows a stressed weak syllable. i-syncope cannot apply in any of the derivations (19)-(23b) because the suffix does not contain a vowel. Otherwise the rule must apply. (21) shows that i-syncope must precede umlaut and raising.

This analysis would have difficulties in accounting for irregular forms like (16a), (16b) and (17a), however. It would clearly be undesirable to extend the environment of i-syncope to include weak stressed syllables ending in l or t. This would not only further complicate an already complex rule but also require that just the additional environment be a minor rule for which lexical items are marked whereas the rest of the rule applies regularly throughout the language.⁷ This extended form of the rule is not only undesirable, however. It also fails to generate all the correct examples since it would fail to apply to the underlying form gi+zal+i+t to produce (16b) gizalt since the suffix does not contain a vowel. An alternative analysis might propose a morphologically conditioned alternation which removed the theme i in the past tense of certain marked verbs like zellen and retten. This might be achieved by positing two morpheme alternants for present and past tense stems (e.g. zal+i and zal) or by a minor rule of theme-deletion which deletes the theme-vowel of marked verbs in the past tense⁸. However this is presented it is clear that the alternation must be morphologically and not purely phonologically conditioned. This can be seen by comparing the present tense third person singular form of zellen which is zel+i+t with the uninflected past participle gi+zal+t. The phonological shape of the suffix is the same in both cases yet the i is only deleted in the past tense form. I am going to make the somewhat arbitrary decision of representing this alternation by the rule of theme-deletion given in (24).

(24) theme-deletion⁷

$$\left[\begin{array}{c} i \\ +\text{theme} \end{array} \right] \rightarrow \emptyset / \left[\begin{array}{c} \text{---} \\ + \text{past} \end{array} \right]$$

The i-syncope analysis still does not quite work, however. We have introduced the rule of theme-deletion in order to delete i in past tense forms where it would not be deleted by i-syncope. In certain dialects verbs such as zellen and retten would be marked for this rule in order to produce their past tense forms zalta and ratta. However, now an incorrect uninflected past participle *giratt would be generated instead of giritit. In order to derive the correct form and not complicate i-syncope or theme-deletion in some ad hoc way we would need a rule which inserts i again between the two t's. Such a rule is provided by the i-epenthesis analysis. However, the i-epenthesis analysis eliminates the need for the rule of i-syncope.

The i-epenthesis analysis includes the rule of theme-deletion (or past tense morpheme alternants without thematic i for certain verbs). However, many more verbs are marked for this rule than in the i-syncope analysis. In fact, the only verbs which are not positively marked for this are those with weak stem syllables which do not end in l or t. Some of this irregular sub-class are marked for it and some are not. This allows us to make a lexical generalization which is represented by the redundancy rule (25)

$$(25) \check{C}\check{V}C' + \left[\begin{array}{c} V \\ +\text{theme} \end{array} \right] \rightarrow \left[-\text{theme-deletion} \right]$$

$C' \neq l, t$

If theme-deletion is regarded as a minor rule as we have been assuming so far and (25) is the only lexical generalization that is made about it this would mean that all other verbs in its domain would have to be individually marked for it. This would clearly be missing a generalization since all non-weak syllable stems undergo this rule. Rather than add another redundancy rule to this effect it seems better to regard theme-deletion as a general rule in the i-epenthesis analysis. The effect of (25) is then to make a generalization about those verbs which are exceptions to this general rule. Those weak syllable stems ending in l or t which are exceptions to theme-deletion are marked individually with the feature $\left[-\text{theme-deletion} \right]$. It is possible, however, to devise a notation which captures directly that it is just those weak syllable stems in l or t which may or may not be exceptions to theme-deletion. This is done by introducing a symbol into the notation of redundancy rules which might be read as 'possibly'. ^o Using this symbol we might formulate a redundancy rule of the form (26).

$$(26) \check{C}\check{V} \left\{ \begin{array}{c} l \\ t \end{array} \right\} + \left[\begin{array}{c} V \\ +\text{theme} \end{array} \right] \rightarrow \diamond \left[-\text{theme-deletion} \right]$$

(26) might be read as: "some but not all lexical items of the form $\check{C}\check{V} \left\{ \begin{array}{c} l \\ t \end{array} \right\} + \left[\begin{array}{c} V \\ +\text{theme} \end{array} \right]$ are exceptions to theme-deletion". The desirability and power of such rules and their implications for phonological theory are, of course, matters for future investigation. It is only mentioned here as a suggestion of a possible notation to express a lexical generalization that would otherwise only have been implicit in the feature markings on individual lexical items. However, it seems worth noting that (25) and (26) can be collapsed into a single generalization using the familiar notational device of angle brackets from phonology. The result is shown in (27).

$$(27) \check{C}\check{V} \left\{ \begin{array}{c} C' \\ \left\langle \left\{ \begin{array}{c} l \\ t \end{array} \right\} \right\rangle_a \end{array} \right\} + \left[\begin{array}{c} V \\ +\text{theme} \end{array} \right] \rightarrow \langle \diamond \rangle_b \left[-\text{theme-deletion} \right]$$

If a, then b

$C' \neq l, t$

(27) captures a generalization that it was not possible to express in the

purely phonological i-syncope analysis. Such a generalization is also not obviously representable by standard means in a system where morpheme alternants are chosen instead of the morphological rule of theme-deletion.

In (28) the rule of i-epenthesis appears.

$$(28) \quad \text{i-epenthesis} \\ \emptyset \rightarrow i / \left\{ \begin{array}{c} \text{C} \\ \text{V} \\ +\text{stress} \end{array} \right\} + \text{---} \text{C##}$$

This rule must be ordered between theme-deletion and umlaut. This will allow the derivations (19')-(23') which correspond to (19)-(23).

(19')	a. <u>ner+i+t+a</u>	b. <u>gi+ner+i+t</u>	c. <u>gi+ner+i+t+er</u>
theme-del.	-----	-----	-----
i-epen.	-----	-----	-----
umlaut	-----	-----	-----
raising	-----	-----	-----
(20')	a. <u>hör+i+t+a</u>	b. <u>gi+hör+i+t</u>	c. <u>gi+hör+i+t+er</u>
theme-del.	hör+∅+t+a	gi+hör+∅+t	gi+hör+∅+t+er
i-epen.	-----	gi+hör+it ⁹	-----
umlaut	-----	gi+hör+it	-----
raising	-----	-----	-----
(21')	a. <u>stark+i+t+a</u>	b. <u>gi+stark+i+t</u>	c. <u>gi+stark+i+t+er</u>
theme-del.	stark+∅+t+a	gi+stark+∅+t	gi+stark+∅+t+er
i-epen.	-----	gi+stark+it	-----
umlaut	-----	gi+stärk+it	-----
raising	-----	gi+sterk+it	-----
(22')	a. <u>mahal+i+t+a</u>	b. <u>gi+mahal+i+t</u>	c. <u>gi+mahal+i+t+er</u>
theme-del.	mahal+∅+t+a	gi+mahal+∅+t	gi+mahal+∅+t+er
i-epen.	-----	gi+mahal+it	-----
umlaut	-----	gi+māhal+it	-----
raising	-----	-----	-----
(23')	a. <u>sā+i+t+a</u>	b. <u>gi+sā+i+t</u>	c. <u>gi+sā+i+t+er</u>
theme-del.	sā+∅+t+a	gi+sā+∅+t	gi+sā+∅+t+er
i-epen.	-----	gi+sā+it	-----
umlaut	-----	gi+sā+it	-----
raising	-----	-----	-----

Theme-deletion does not apply in (19') because of the weak stem syllable. It must, however, apply in the remaining derivations. Only in (20'b)-(23'b) can an i be restored by the rule of i-epenthesis since only here

does the suffix consist of a single consonant. It might be objected that the analyses (20'b)-(23'b) are redundant since an i is deleted by one rule and restored by another. This is an aspect which looks better if the analysis includes morpheme alternants rather than a morphological rule since in that case the underlying phonological form would not include i. It seems that this apparent redundancy is a small expense for being able to capture a morphological and phonological generalization and for being able to generate the correct forms of zellen and retten. Verbs such as retten on this analysis may or may not undergo theme-deletion, according to how they are marked in the lexicon. Thus the past tense form ratta would be derived from underlying rat+i+t+a. The uninflected past participle will also be correctly generated from underlying gi+rat+i+t, since although the i is removed by theme-deletion another will be inserted by the rule of i-epenthesis. Verbs like zellen which do not have i in the preterite or the uninflected past participle can on this analysis be marked as exceptions to i-epenthesis. The differences between these verbs supports the claim that theme-deletion and i-epenthesis are separate generalizations.

The i-epenthesis analysis provides a simple explanation for these forms which could not be accounted for on the i-syncope analysis. In addition the rule of i-epenthesis captures a further generalization in the phonology of OHG. It allows us to posit the same underlying endings for the second and third person singular present for all OHG verbs without introducing any new rules into the analysis. In classical accounts it has been suggested that there are two sets of endings for these forms, +s and +t for the weak verbs and +is and +it for the strong verbs (B/M § 306a). The difference can be seen by comparing verbs whose roots end in a theme vowel with strong verbs whose roots end in a consonant. The present tense indicative paradigm of nerien is given in (29).

- (29) a. ner+i+u 'I save'
 b. ner+i+s 'you...'
 c. ner+i+t 'he...'
 d. ner+i+emes 'we...'
 e. ner+i+et 'you...'
 f. ner+i+ent 'they...' 10

The strong verb tragan 'to carry' has the corresponding paradigm (30).

- (30) a. trag+u 'I carry'
 b. treg+is 'you...'
 c. treg+it 'he...'
 d. trag+emes 'we...'
 e. trag+et 'you...'
 f. trag+ent 'they...'

Clearly we are missing some sort of generalization if we do not relate the endings of (30b) and (30c) to the endings of (29b) and (29c). An account which stated that strong verbs with consonant final roots took different endings would claim that it was an accident that the endings were so similar. One possible account might propose +is and +it as the general endings and derive (29b) and (29c) from underlying forms neri+is and neri+it by a rule that deleted one of the i's. This looks initially

plausible since we shall need a rule that drops i in front of a vowel when we come to examine the present paradigms in more detail. For example, underlying zel+i+u becomes zellu 'I tell' where the i has first triggered a rule of consonant gemination and then disappeared by a rule of i-drop. However, it cannot be this rule which accounts for the second and third person singular forms. i-drop is crucially ordered after gemination since it is the i preceding a vowel which causes gemination. The rule which dropped the i in the second and third person singular, however, would have to apply before gemination since this latter rule never applies in these forms. This is exemplified by the paradigm (31).

- (31) a. zellu 'I tell'
 b. zelis 'you...'
 c. zelit 'he...'
 d. zellemēs 'we...'
 e. zellet 'you...'
 f. zellent 'they...'

If (31b) and (31c) were derived from underlying zel+i+is and zel+i+it we would need an extra rule ordered before gemination to delete one of the i's. If, however, we assume that the endings are simply +s and +t, i-epenthesis predicts that consonant final roots will have an i inserted before these endings. Thus (30b) and (30c) will have the derivations in (32)

- | | | |
|---------|------------------|------------------|
| (32) | a. <u>trag+s</u> | b. <u>trag+t</u> |
| i-epen. | trag+is | trag+it |
| umlaut | träg+is | träg+it |
| raising | treg+is | treg+it |

Note that this example further confirms that i-epenthesis must precede umlaut and raising. This ordering was found necessary to account for (21') - starcta as opposed to gisterkit.

I have shown that an adequate phonology of OHG needs a morphological alternation of theme-deletion and a rule of i-epenthesis and that by using general forms of these two rules it is possible to eliminate the phonological rule of i-syncope which is traditionally considered as the historical change from early Germanic to OHG. Why should the phonology of OHG include the i-epenthesis analysis and not the i-syncope analysis? Let us assume that i-syncope does in fact mirror a phonologically conditioned change, or more probably, the result of a series of phonological changes. Let us hypothesize that there was a stage of pre-OHG which contained the phonological rule of i-syncope but not any rule of theme-deletion. This would mean that the past tense forms of zellen and retten would always be zelita and retita. The child acquiring this phonology would be able to choose between two possible generalizations. He could choose the purely phonological generalization expressed by i-syncope or he could note that certain verbs always lose an i in the past tense. There is a sense in which the phonological rule is opaque¹¹ to the past tense forms (except for the cases where i is inserted by the independently motivated rule of i-epenthesis). Let us now suppose that there is something in the child's acquisition device which prevents him from

analyzing as phonological an alternation which corresponds to major sub-parts of a paradigm such as present and past tense forms. This would predict that the child would not acquire the phonological rule of i-syncope but rather reanalyze it as the morphological rule of theme-deletion, the phonological generalization of which may be captured by lexical redundancy rules. Such a rule one might expect to spread irregularly through the lexicon applying to certain other lexical items in the past tense though not with any clear or regular generalization. This would explain the attested system of OHG where theme-deletion has spread to the past tenses of other verbs which were not included in the phonological domain of i-syncope. It is important to notice that the process has not spread generally as one might expect when a phonological rule generalizes. It is not the case that all short syllable roots ending in l or t lose i in the past tense. Rather it is the case that certain marked verbs of this form lose the i. This is just what one might expect from a morphological rule which is associated with a redundancy rule in the lexicon.

I shall now examine the evidence for the presence of thematic i in the underlying representations of the present tense forms of these verbs. I shall show that for two slightly differing stages of Upper German (UG) dialects there is an adequate analysis in which thematic i underlies all the present tense verb forms. For the later stage, however, there is an equally adequate analysis which uses the same rules but in which thematic i is only present in the lexical representation of weak stem syllable verbs. Thus it appears that thematic i may have disappeared from the underlying representation of the present tense of those verbs which regularly lose it in the past tense.

The earlier stage that I shall examine is eighth century UG. An account of the present tense of nerien, of which the indicative is given in (33), looks as if it should be straightforward.

- (33) a. ner+i+u
 b. ner+i+s
 c. ner+i+t
 d. ner+i+emēs
 e. ner+i+et
 f. ner+i+ent

It appears that the endings have merely been added to the root form and that no phonological rules have applied. However, there is some evidence that something more complicated is going on. OHG orthographic i represents both i and j (B/M §115). For example, prevocalically in the words iar 'year', iung 'young' it represents j. We thus have to decide which sound it represents when it precedes a vowel in the forms (33). There is some orthographic evidence that it represents a j in the context

✓
 Vr ___ V but vocalic i in other post-tonic syllables preceding a vowel (B/M §118 Anm. 3). Underlying i is represented as i or e when it does not follow a stressed weak syllable ending in r. Examples from B/M §118 are given in (34).

- (34) a. minnea 'love'
 b. minnia (variant form from Braune/Helm (1962), pg. 221)
 c. redia 'speech'
 d. redea (variant form from Braune/Helm (1962), pg. 227)
 e. māreo 'famous' (nom./acc. fem. pl. of māri)

While orthographic i occurs in the context $\check{V}r_____\check{V}$ orthographic e does not. Thus no forms such as *nerean are attested. In addition the underlying i may be represented as g in this context (suggesting perhaps that it was pronounced as a glide). Examples are given in (35).

- (35) a. nergen 'to save'
b. spurgen 'to investigate'

g does not appear as the representative of i in other contexts. We do not get written forms such as *minnga or *mārgo. These facts lead us to propose a rule of glide-formation which will represent the i in the context $\check{V}r_____\check{V}$ as distinct from i in other contexts. Though we cannot be sure that it was pronounced as a glide and not, for example, as a palatal spirant as B/M suggest, a rule of glide-formation seems to be the minimal hypothesis which will allow underlying i to be distinguished in this context. Glide-formation is given in (36).

(36) Glide-formation

$$i \rightarrow j / \left[\begin{array}{c} \check{V} \\ +str \end{array} \right] r_____\check{V}$$

There is a third way in which underlying i in the context $\check{V}r_____\check{V}$ was orthographically distinct. It could also be represented as ig or eg. Thus we get forms such as (37).

- (37) a. nerigen 'to save'
b. spuregen 'to investigate'
c. herige 'army' (dat. sing. of heri)
d. ferigun 'ferryman' (nom./acc. pl. of fergo¹²)

This suggests that there was a rule of i-insertion which inserted vocalic i between the r and the j. The exact nature of this rule will not concern us. We need only know that it inserts an i between r and j in the relevant examples. On this analysis it appears that i could also represent the string ij at least in ninth century Bavarian since the neums written over the Petruslied indicate that skerian 'to arrange into a host' and nerian were trisyllabic. If this is also the case for eighth century UG then we may suppose that i-insertion applied in the derivation of written forms such as neriu. We would derive this form as in (38).

- (38)
- | | |
|-------------|-----------------|
| | <u>ner+i+u</u> |
| glide-form. | <u>ner+j+u</u> |
| i-insert. | <u>ner+ij+u</u> |

It is immaterial to our present purposes whether i-insertion applied regularly in eighth century UG or not. In order to account for the infinitive form nerien we must propose another rule. The infinitive ending in OHG is -an. This is the form of the ending that appears on all strong verbs except those which have thematic i in the present tense. Examples are neman 'to take', zichan 'to pull', faran 'to go'. The infinitive ending only occurs as -en when the root ends in i. This suggests that there is a rule of fronting of the form (39).

(39) Fronting

$$a \rightarrow e / i, j \text{ ______ } C \text{ ______ } \# \#$$

There is independent motivation for such a rule (B/M §58 Anm. 1) which is to be found mainly in nouns whose stems end in i and which take a as an ending. For example, a large class of masculine nouns, the a-stems (B/M §193), have a zero ending in the nom. acc. sing. and -a in the nom. acc. plur. as shown in (40).

- (40) a. tag 'day'
b. taga 'days'

A sub-class of these nouns, the ja-stems (B/M §198), whose roots end in i and which otherwise take the same endings, take an e in the nom. acc. pl. This is shown in (41).

- (41) a. hirti 'shepherd'
b. hirte 'shepherds'

The underlying i is lost in (41b) by a rule of i-drop which deletes an i before a following e as shown in (42).

- (42) i-drop¹³

$$\left[\begin{array}{c} i \\ \text{-str} \end{array} \right] \rightarrow \emptyset / \text{ ______ } e$$

(More examples of the operation of this rule are given below.) Thus (41b) will be derived as in (43).

- (43) hirt+i+a
fronting hirt+i+e
i-drop hirt+e

Further examples of the application of fronting are found in feminine ō-stem nouns (B/M §207). The nom. acc. gen. sing. of these nouns end in a. An example is geba 'gift'. A sub-class of these nouns, the jō-stems (B/M §209), which otherwise take the same endings have e in the nom. acc. gen. sing. An example is sunte 'sin'. This word would have a derivation similar to (43).

We now turn our attention to verbs with weak stressed root syllables not ending in r. These differ in that the consonant preceding the i geminates if the ending begins with a vowel. We take as an example the root frūmi 'fulfil' sample forms of which are given in (44).

- (44) a. frūmmen 'fulfil' (infinitive)
b. frūmmiu¹⁴ 'I fulfil'
c. frūmit 'he fulfils'

In order to account for (44a) and (44b) we propose the rule (45).

(45) Gemination

$$\emptyset \rightarrow C_i / \left[\begin{array}{c} \check{V} \\ +str \end{array} \right] C_i \text{---} iVX]_V$$

This rule will geminate consonants only in verbs whose roots end in i and contain a weak stem syllable.¹⁵ The forms in (44) have the derivations in (46).

(46)	a. <u>früm+i+an</u>	b. <u>früm+i+u</u>	c. <u>früm+i+t</u>
gemination	frümm+i+an	frümm+i+u	-----
fronting	frümm+i+en	-----	-----
i-drop	frümm+en	-----	-----

Note that i-drop is crucially ordered after fronting and gemination since it would bleed both of these rules if it were ordered first. Fronting and gemination may occur in either order. Note also that glide-formation must precede gemination in order to prevent r from being geminated in a verb such as nerien. The derivations of frümmen and nerien are compared in (47).

(47)	a. <u>ner+i+an</u>	b. <u>früm+i+an</u>
glide-formation	ner+j+an	-----
gemination	-----	frümm+i+an
fronting	ner+j+en	frümm+i+en
i-drop	-----	frümm+en
i-insertion	ner+ij+en	-----

The comparison of these two examples provides us with a phonological argument for the rule of glide-formation for which we gave orthographic evidence previously. If this rule did not exist we would have to account for the difference in these examples by placing a condition on both gemination and i-drop stopping these rules from applying when the i mentioned in each of them follows an r. This would give us the derivations in (48).

(48)	a. <u>ner+i+an</u>	b. <u>früm+i+an</u>
gemination	-----	frümm+i+an
fronting	ner+i+en	frümm+i+en
i-drop	-----	frümm+en

This solution is less desirable because it requires the same condition to be placed on two separate rules. Also it is observationally inadequate not only in that it does not account for the orthographic data we noted but also in that it predicts that i-drop will never apply after r. This is shown to be false by a form such as hören 'to hear' where i has dropped after r following a long vowel. The present analysis with glide-formation predicts this form since the rule applies only when there

is a short vowel and the i in underlying h^or+i+an remains and is later deleted by i-drop.

There is yet another reason for postulating the rule of glide-formation; it allows us to explain quite simply a subsequent change which took place in Alemannic and Franconian. In Franconian, for example, which although not an UG dialect had a similar phonology to the dialects we are describing, forms such as nerigen became at a later stage nerren. Franck (1909) §55.2 notes this change as a problem since it is not clear from the surface forms how nerigen could become nerren directly without some intermediate stage. The present analysis would explain this step quite simply by the loss of glide-formation. This would allow gemination to apply in the context Vr and i-insert would no longer be able to apply.

Evidence that gemination cannot apply generally in the language and must be morphologically restricted comes from the i-stem nouns (B/M §215 and §218). These nouns form their plural by adding i to the root. In the genitive plural the additional case ending o is added. Examples are given in (49).

- (49) a. gast 'guest' (nom. acc. sing.)
 b. gesti (nom. acc. pl.)
 c. gestio (gen. pl.)
 d. anst 'grace' (nom. acc. sing.)
 e. ensti (nom. acc. pl.)
 f. enstio (gen. pl.)

If gemination applied generally we would expect nouns of this class with weak root syllables to have a geminated form in the gen. pl. This, however, is not the case. The gen. pl. of stat 'place', for example, is stetio¹⁶ and not *stettio as one would expect if gemination were not restricted.

The rules proposed so far will also generate present tense forms of class I weak verbs which do not have weak stem syllables. Some examples are given in (50).

- (50) a. wānen 'to be of the opinion'
 b. wāniu¹⁷ 'I am of the opinion'
 c. wānit 'he is of the opinion'

Since both glide-formation and gemination apply only to stems with weak stressed syllables it is only fronting and i-drop which are relevant to these forms. Their derivations are shown in (51).

- | | | | |
|------|--------------------|-------------------|-------------------|
| (51) | a. <u>wān+i+an</u> | b. <u>wān+i+u</u> | c. <u>wān+i+t</u> |
| | fronting | wān+i+en | ----- |
| | i-drop | wān+∅+en | ----- |

The similar forms in (52) are accounted for by analogous derivations.

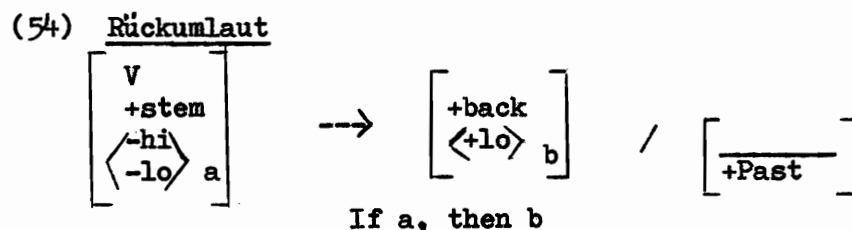
- (52) a. māhalen 'to vow'
 b. māhaliu¹⁸ 'I vow'
 c. māhalit 'he vows'

- d. $\bar{s}a\bar{e}n$ ¹⁹ 'to sow'
 e. $\bar{s}a\bar{i}u$ ¹⁸ 'I sow'
 f. $\bar{s}a\bar{i}t$ 'he sows'

The preceding analysis of the present tense forms of class I weak verbs shows that it was necessary to posit an underlying thematic i for them. Even where the i does not show up on the surface its presence is evidenced by the application of the fronting rule in the infinitive and the application of gemination in all but the second and third person singular of the weak stem syllables. The question now arises whether it is this i which causes the unlauded form of the stem vowel. Kiparsky's (1968) alternation condition would require that the unlauded (or unlauded and raised) stem vowel of the weak syllable stems be an underlying segment and not derived by the phonological rule since there is no alternation throughout the complete paradigm. However, in verbs that undergo theme-deletion there is such an alternation. This alternation, however, is not present in the present tense sub-part of the paradigm. This is illustrated by the forms of the verb sterken 'to strengthen' which are reconstructed and contrasted with past tense forms in (53).

- (53) a. $sterkiu$ 'I strengthen'
 b. $sterkis$ 'you strengthen'
 c. $sterkit$ 'he strengthens'
 d. $sterkem\bar{e}s$ 'we strengthen'
 e. $sterket$ 'you strengthen'
 f. $sterkent$ 'they strengthen'
 g. $starcta$ 'I/he strengthened'
 h. $starct\bar{o}s$ 'you strengthened'
 i. $starctum$ 'we strengthened'
 j. $starctut$ 'you strengthened'
 k. $starctun$ 'they strengthened'
 l. $gisterkit$ 'strengthened' (uninflected past part.)
 m. $gistarct\bar{e}r$ (masc. sing. nom. past part.)

Clearly, the hypothesis presented earlier in connection with the reanalysis of i-syncope as theme-deletion also requires that there be a morphological alternation here. There is no alternation within the present tense and therefore the child learning the language would not perceive the e as being derived from underlying a. However, he would perceive a morphological alternation between present and past tense. Note that a occurs in the past tense except in (50i) when there is the i supplied by i-epenthesis to cause mutation. In order to account for this alternation we propose a rule of Rückumlaut which formalizes Grimm's original intuition about these data. This minor rule for which verbs must be marked in the lexicon is given in (54).



For further discussion and evidence for the exact form of this rule see Cooper (in prep.). This rule allows an interesting simplification in the analysis of ninth century UG. Before I go on to discuss the change between eighth and ninth century UG I list all the rules that have been proposed in this paper in the order in which they apply. This is done in (55).

(55)

i. theme-deletion

$$\begin{bmatrix} i \\ +\text{theme} \end{bmatrix} \rightarrow \emptyset / \begin{bmatrix} \text{---} \\ +\text{Past} \end{bmatrix}$$

ii. Rückumlaut (minor)

$$\begin{bmatrix} V \\ +\text{stem} \\ \langle -hi \rangle \\ \langle -lo \rangle_a \end{bmatrix} \rightarrow \begin{bmatrix} +\text{back} \\ \langle +lo \rangle_b \end{bmatrix} / \begin{bmatrix} \text{---} \\ +\text{Past} \end{bmatrix}$$

If a, then b

iii. i-epenthesis

$$\emptyset \rightarrow i / \left. \begin{bmatrix} C \\ V \\ +\text{str} \end{bmatrix} \right\} + \text{---} C\#\#$$

iv. umlaut

$$V \rightarrow \begin{bmatrix} -\text{back} \end{bmatrix} / \begin{bmatrix} \text{---} \\ +\text{stress} \end{bmatrix} \quad X \ i, j$$

v. raising

$$\check{a} \rightarrow \check{e} / \begin{bmatrix} \text{---} \\ +\text{stress} \end{bmatrix} \quad C_0 \ i, j$$

with conditions on C_0 vi. glide-formation

$$i \rightarrow j / \begin{bmatrix} V \\ +\text{stress} \end{bmatrix} \quad r \text{---} V$$

vii. gemination

$$\emptyset \rightarrow C_i / \begin{bmatrix} V \\ +\text{str} \end{bmatrix} \quad C_i \text{---} iVX \quad V$$

viii. fronting

$$\check{a} \rightarrow \check{e} / i, j \text{---} C_0\#\#$$

ix. i-drop

$$i \rightarrow \emptyset / \begin{bmatrix} \text{---} \\ +\text{stress} \end{bmatrix} \quad e$$

x. i-insertinserts i between r and j

This represents part of the phonology of eighth century UG. Two changes occurred between this and the later stage of UG which I shall refer to as ninth century. Firstly, the rule of fronting (55viii) was lost. This intermediate stage is attested in forms such as süntia 'sin' for earlier sünte (B/M §209) and infinitives such as hüekian 'to think', hrō-rian 'to touch', galaupian 'to believe' (B/M §314 Anm. 3). Note that the loss of a phonological rule here explains why the infinitive ending levelled in the direction of -an and not -en, which as B/M §314 point out, would have been equally plausible on an analogical analysis. The occasional -en endings on strong verbs which B/M §314 Anm. 1 refer to might be explained by early representations of reduced vowels or by morphologization of the endings in a few dialects. The second change which took place was the generalization of i-drop to delete an unstressed i before any vowel. Thus süntia became sünta and i-stem infinitives ended in simple -an rather than -ian (B/M §314). Also first person singular forms such as fremmiu and wāniu lost their i becoming fremmu and wānu. Genitive plural forms of i-stem nouns also lost the i. gestio became gesto and enstio changed to ensto.

Ninth century UG, then, contained the rules (55) with the exception of fronting and the generalized form of i-drop. I shall show that this system will generate the correct present tense forms of the class I weak verbs from two different sets of underlying forms. In the first set of underlying forms all roots contain thematic i and are the same as those we posited for eighth century UG. In (56) I give the ninth century forms of the crucial eighth century forms we discussed.

- (56) a. nerian = [nerijan]
 b. neriu = [neriju]
 c. nerit
 d. frümman
 e. frümmu
 f. frümit
 g. wānan
 h. wānu
 i. wānit
 j. māhalan
 k. māhalu¹⁸
 l. māhalit
 m. saan²⁰
 n. sau¹⁸
 o. sait

(56a) and (56b) are derivable from ner+i+an and ner+i+u respectively. The only rules that apply are glide-formation and i-insert. (56c) is derivable from ner+i+t and no rules can apply to it. Similar derivations

exist for all the third person forms. (56d) and (56e) are derivable from früm+i+an and früm+i+u respectively. Only gemination and i-drop will apply to these forms. The remaining non-third person forms will only undergo i-drop.

In the alternative set of underlying forms only the verbs with underlying weak stem syllables contain thematic i. Thus the derivations of (56a) - (56f) will remain unchanged. (56g) will be derived from wän+an and none of the rules will apply in its derivation. Similar derivations exist for all the other non-third person forms. (56i) will be derived from wän+t. To this the rule of i-epenthesis will apply, producing the correct surface form. Similar derivations exist for (56l) and (56o). In fact, i-epenthesis in exactly the form that was motivated earlier will insert an i in just those environments where the original thematic i was not deleted by i-drop. This is because all present tense verb endings either begin with a vowel or consist of a single consonant (as shown in (33)).

It seems that there is little evidence for thematic i in the underlying forms of non-weak syllable stems in ninth century UG and that the child acquiring this phonology would choose the second analysis without underlying i. Note also that theme-deletion no longer applies in these derivations. There is, however, an important class of apparent counter-examples to this claim. So far we have excluded from the discussion the imperative singular of weak verbs. They represent a counter-example to the present analysis in so far as they consist of the root together with its theme vowel, the imperative singular ending being zero for both weak and strong verbs. The imperative singular of sterken, for example, is sterki. However, it seems unlikely that a single form should bear the weight of evidence for an underlying i in the whole paradigm. A plausible alternative might be that the i was reanalyzed in those paradigms as an imperative marker. If the i of the imperative singular is viewed as an ending rather than as a theme-vowel the present analysis remains intact.

Footnotes

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1. The change of stem vowel in these past tense forms is effected by an independent phonological rule which does not concern us here (see Wright (1910) §80).
2. gg is a digraph for the velar nasal.
3. This represents the Gothic reflex of Sievers' Law.
4. I shall discuss consonant gemination and the disappearance of i in these forms below. For discussion of the evidence for unlauded vowels not represented in the normal orthography see Cooper (in prep.). Umlaut is not represented at all in OHG orthography except in the alternation ä~ë.

5. There are some apparent counter-examples to the general application of i-syncope which appear in the comparison of i-stem adjectives. One might expect it to produce the wrong compared forms shown in (i).

- (i) a. hreini 'clean' - hreini+ro (*--> hreinro) (comp.)
 b. hreini+sto (*--> hreinsto) (sup.)
 c. suozi 'sweet' - suozi+ro (*--> suozro)
 d. suozi+sto (*--> suozsto)
 e. blīdi 'merry' - blīdi+ro (*--> blīdro)

However, the comparative and superlative endings must themselves contain vowels. If the endings were +ro and +sto as assumed in (i) we would predict the following wrong forms for adjectives with roots ending in a consonant or o as shown in (ii).

- (ii) a. *blint+ro 'blind'
 b. *blint+sto
 c. *garo+ro 'ready'
 d. *garo+sto

In fact comparative and superlative forms always contain either i or ō and there is no sure way to predict which occurs. Some adjectives allow both (B/M §261). (iii) gives some examples of the comparison of consonant stems.

- (iii) a. sālīg 'blessed' - sālīgōro - sālīgōsto
 b. hēr 'sublime' - hēriro ~ hērōro - hēristo ~ hērōsto
 c. reht 'just' - rehtiro ~ rehtōro

i-stem adjectives normally have i but also sometimes have ō as shown in (iv).

- (iv) tiuri 'dear' - tiuriro ~ tiurōro

B/M do not give examples of the comparison of ō-stem adjectives but presumably something similar is true. The facts make it clear that we must posit two comparative and superlative morphemes for which adjectives are lexically marked: +iro, +isto and +ōro, +ōsto. Now the i-stem adjectives in (i) will not meet the environment for i-syncope because the suffix begins with a vowel. The stem final i will be motivated by an independently motivated rule of i-drop (see below) which deletes an unstressed i before another vowel and hreiniro will have the derivation (v).

- (v) hrein+iro
 i-sync. -----
 uml. -----
 i-drop -----
 output hreiniro

These data thus do not constitute evidence against i-syncope.

6. Such a rule or morpheme alternation is independently needed to account for the sub-classes of strong verbs V and VI which have thematic i in the present but not the past (B/M §327, §344, §347).

7. I am assuming here a convention which spreads morphological features onto every segment in a form. Any way of representing that the i occurs in a past tense form would do just as well.
8. The symbol \diamond is, of course, imported from modal logic. Its use here is justified only by the fact that its English translation is 'possibly'.
9. I assume here a convention which reduces a string of morpheme boundaries to a single +.
10. I shall show below that there are phonological rules which apply to these forms. The argument could be constructed in a similar fashion taking these rules into account.
11. This notion is made precise in Cooper (in prep.).
12. This form is listed in Braune/Ebbinghaus (1962) pg. 194.
13. There are a few isolated exceptions to this rule in the earliest OHG monuments (B/M §118 Anm. 2). Thus, for example, when the dative ending -e is added to kunni 'race' kunnie is sometimes found besides the normal kunne.
14. I have not found this form attested but a similar form furisezziu 'I put forward' is listed in Graff (1834).
15. B/M (§96 Anm. 1 and §359 Anm. 1) mention forms with geminate consonants after long vowels attested from the eighth even through to the eleventh century. I shall not account for these forms here.
16. This example from Graff (1834) is actually an early ninth century form from the Reichenauer Glossar but serves to illustrate the stage of the language we are referring to approximately as eighth century UG.
17. Raven (1967) lists this as a ninth century form but it may be regarded as belonging to what I am labelling approximately as eighth century UG.
18. I have not been able to find any eighth or ninth century UG attestations of first pers. sing. forms for polysyllables or verba pura.
19. Eighth century Bavarian introduces an h in such infinitives (B/M §152b Anm. 2) though eighth century Alemannic does not. I shall ignore this fact.
20. Listed in Graff (1834).

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