An Analysis of I-Umlaut in Old English

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Meizi Piao. 2012. An Analysis of I-Umlaut in Old English. *SNU Working Papers in English Linguistics and Language X, XX-XX* Lass (1994) calls the period from Proto-Germanic to historical Old English 'The Age of Harmony'. Among the harmony processes in this period, i-umlaut has been considered as 'one of the most far-reaching and important sound changes' (Hogg 1992, Lass 1994) or as 'one of the least controversial sound changes' (Colman 2005). This paper tries to analyze i-umlaut in Old English within the framework of the Autosegmental theory and the Optimality theory, and explain how suffix *i* or *j* in the unstressed syllable cause the stem vowels in the stressed syllable to be fronted or raised. **(Seoul National University)**

1. Introduction

Old English is an early form of the English language that was spoken and written by the Anglo-Saxons and their descendants in the area now known as England between at least the mid-5th century to the mid-12th century. It is a West Germanic language closely related to Old Frisian.

During the period of Old English, one of the most important phonological processes is umlaut, which especially affects vowels, and become the reason for the superficially irregular and unrelated Modern English phenomenon.

I-Umlaut is the conditioned sound change that the vowel either moves directly forward in the mouth [u>y, o>e, ɑ>æ] or forward and up [ɑ>æ>e]. In this process, the speaker anticipates a high palatal sound, an *i* vowel or a *j* glide in the following syllable, by fronting or raising the vowel; that is, the vowel comes to resemble in its articulation of the *i* or the *j* (based on Briton & Arnovick 2011).

I-Umlaut is important in Old English because a number of major inflectional endings originally contained an *i* or a *j*, though this sound is no longer present. It accounts for some irregular noun plural forms, comparatives, and certain verbs. The legacy of umlaut in Modern English is widespread. It's working in:

- so-called irregular noun plurals (tooth/teeth, foot/feet, goose/geese)
- comparatives (old/elder),
- verbs (food/feed, gold/gild, full/fill) (Briton & Arnovick 2011)

In addition, i-umlaut also accounts for an apparent consonant irregularity in Old English. In a word such as *gēs*, the initial sound is pronounced [g] in Old English, not [j] as one would expect if relying on the regular patterns of Old English pronunciations. Likewise, in *cēlan* 'to cool', the initial sound is pronounced [k], not [č]. The answer to this puzzle is that these words used to contain back vowels, so the palatalization process did not apply. Only later did umlaut come to affect these words and produce the front vowels that we see in *gēs* and *cēlan*. Therefore, the process of umlaut makes it difficult to ascertain the value of *c* and *g* in Old English because one must know the history of the word (based on Briton & Arnovick 2011).

Since the vowel change caused by i-umlaut was not restricted to the certain specific dialect, but occurred regularly in most dialects in OE, the detailed analysis of i-umlaut in OE can contribute to a deep understanding of one of the phenomena that looks superficially irregular or unrelated in Modern English.

Hence, the goals of this study are **i**) to explore what motivates i-umlaut in OE and **ii**) to show how the phenomenon can be analyzed within the framework of Autosegmental analysis and Optimality Theory(OT) analysis. This study is organized as follows. Section 2 introduces the data. Section 3 provides an Autosegmental analysis of i-

umlaut in OE, and section 4 provides an OT analysis of i-umlaut in OE. Then, the section 5 summarizes and concludes this study.

2. Data

During the period of Old English, the suffix *i* or *j* in the unstressed syllable caused the stem vowels in the stressed syllable to be fronted or raised. The target vowels moves upward or forward toward the high front position under the influence of the following high front vowel or glide. Thus a set of vowel changes occurred and it is collectively called as i-umlaut.

First, i-umlaut in OE fronts all the back vowels.[1] However, there is disparity in unrounding of the fronted vowels: The fronted mid vowels, [o] and [ō], undergo a subsequent unrounding and respectively become [e] and [ē] (based on Cassidy&Rngler 1971), whereas the fronted high vowels, [y] and [ȳ] , are not subject to unrounding until the end of OE.

Second, raising by i-umlaut occurs marginally to front vowels: No long front vowels are raised and only the short low front vowel [æ] is raised to [e] (based on An-Nah Moon 2011).

Third, some low back vowels are also raised. When they precede a nasal, the low back vowels [ā] and [a] undergo fronting as well as raising and become [ē] and [e]. Otherwise, they are just fronted to [æ̃] and [æ].

What is mentioned so far can be schematized as follows (based on An-Nah Moon 2011).

(1) I-umlaut in OE: long monophthongs

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[1] Monophthongs undergo i-umlaut in all dialects of OE, while diphthongs are mutated only in West Saxon (WS) dialect but not in non-WS dialects. This study restricted to the mutation of monophthongs.
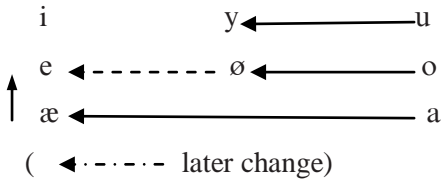
ī   ȳ ◄——————ū

ē ◄- - - - - - -Ø̄◄——————ō

↑

ǣ◄————————ā
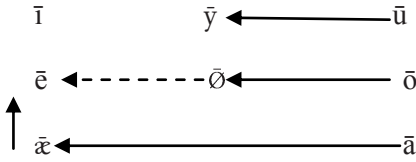
(2) I-umlaut in OE: short monophthongs

i   y◄————u

↑ e ◄- - - - - - ø ◄——————o

æ ◄————————a

(◄·–·–·–   later change)

Table (3) is details of umlaut in Old English.

i-mutation		
Originals	**Mutated**	**Examples**
æ	e	þæc ″covering″, þeccan "to cover"
e	i	helpan "to help", hilpþ "helps"
a+m/n	e+m/n	mann "man", menn "men"
a	æ,e	talu "tale", tellan "to tell"
ā	ǣ	lār "teaching", lǣran "to teach"
o	e	dohtor "daughter", dehter "daughters"
ō	ē	fōt "foot", fēt "feet"
u,o	y	gold "gold", gyldan "to gild"

ū	ȳ	mūs "mouse", mȳs "mice"
ea	ie	eald "old", ieldra "older"
ēa	īe	nēah "near", nīehst "nearest"
eo	ie	beornan "to burn", biernþ "burns"
ēoē	īe	sēoþan "to boil", sīeþþ "boils"

3. An autosegmental analysis of I-umlaut in OE

Whether umlaut is within the scope of vowel harmony, opinions are quite controversial. Because, there have been some attempts to refuse vowel harmony to only those cases which abide by a few select principles as against some others which do not meet these criteria.

The principles below were proposed to characterize harmony by Clements (1977):

(4) Clements' (1977) general principles of harmony
  (a) Vowel harmony involves the spreading of a phonetically definable feature.
  (b) Vowel harmony is root controlled.
  (c) Vowel harmony is a bidirectional process. It affects both suffixes and prefixes.
  (d) Vowel harmony applies in an unbounded manner.
  (e) Root controlled vowel harmony is not optional.

Implicit in (4) is the notion that vowel harmony must spread from the root and also be unbounded, and if so, umlaut-like system must be excluded by the domain of harmony. However, other phonologists propose different opinions consequently. According to them, vowel harmony refuses to be constrained by bounds of typologies defined by

Clements, which fail to describe the range of vocalic agreement phenomena noticed in the world's languages: as long as vocalic assimilation exists, a language may be said to possess vowel harmony. The only criterion that may play a role is the presence of two alternating sets of vowels in the inventory. When one set induces the other to change, vowel harmony exists in that language. Therefore, I believe that i-umlaut is definitely within the scope of the vowel harmony, because when followed by an *i* vowel or a *j* glide, a back vowel in a word stem either moves directly forward or forward and up, in order to resemble its articulation to the *i* or the *j*.

Therefore, in this section, I want to analyze i-umlaut with Autosegmental theory, which is one of the most representational approaches fuelled to a large extent by vowel harmony. About Autosegmental theory, the most fundamental characteristic is that phonological representation can be postulated paradigmatically. In Autosegmental theory, various features of the phonological process are represented on independent tiers and parallel to the segmental tier. These independent tiers have autosegments that are related to the segmental tier by a set of conventions that preserve well-formedness throughout the course of phonological derivations. Phonological rules may apply to the elements of one level to the exclusion of elements of another level. Besides, the spreading features are represented at a lower level than that of the segments. These features recur in neighboring segments as a result of phonetic feature spreading.

The following approach is based on Autosegmental analysis of i-umlaut in OE. The regular rule of English plural formation is simple enough: essentially, add –s, [z] to the singular. However, English has a number of idiosyncratic plurals, and one set of irregular English plurals involves a process of vowel fronting by umlaut, as illustrated in (5):

(5) goose [gus]   gees [gis]

   tooth [tuθ]   teeth [tis]

In Old English, there was a plural suffix –[i]. In addition, the root vowels in these words were [o] in the singular and [e] in the plural, as still reflected in the spelling.
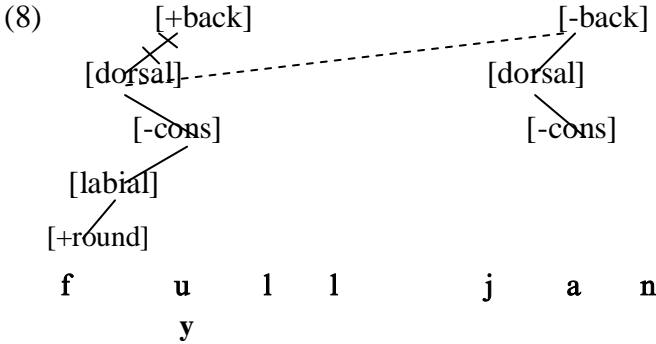
(6) Singular   Plural
    ɡos   ɡosi
    toθ   toθi

What happened next is easy to guess. Specifically, the [-back] feature of the suffix spread to the root vowel, thus fronting it (based on Roca & Johnson.1999):

(7)
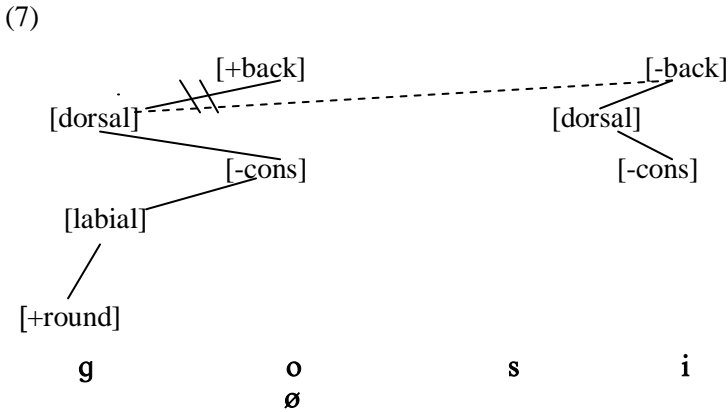
Subsequent developments involved the unrounding of all front round vowels and the loss of the inflectional suffix –[i]: [ges]. At later stage, the mid vowels [e] and [o] underwent raising to [i] and [u], respectively, to yield the contemporary [gis] and [gus] (based on Roca & Johnson 1999)

In addition, verbs derived from adjectives (full/fill), and formed from nouns (food/feed, gold/gild) were also due to i-umlaut.

(8)

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        [+back]                    [-back]
     [dorsal]---------------    [dorsal]
        [-cons]                    [-cons]
    [labial]
    [+round]
     f     u    l    l        j    a    n
           y
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When the suffix *-jan* was added to the root **full** 'full', the **j** caused umlaut of the u-vowel to [y] and then the **j** disappeared, yielding the Old English verb **fyllan** 'to fill'. Then, gradual developments of unrounding caused all front rounded vowels unrounded, including [y] to [i].at a later stage.

In conclusion, i-umlaut in OE is a feature spreading process by analyzing with Autosegmental theory. Features from following unstressed suffix vowel the **i** and the **j** glide spread to stressed stem vowels, and then stem vowels come to resemble in its articulation of the **i** or the **j**.

4. An Optimality Theory analysis of I-umlaut in OE

Ever since Optimality Theory (based on Prince and Smolensky 1993)[2] came into circulation, it has been perceived by a considerable number of generative phonologists worldwide, as perhaps the currently most promising framework of analysis. In this section, I want to study i-umlaut in OE with OT approach, mainly because of OT's ability to

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[2] By contrast, we can sometimes find the OT-based analyses of umlaut in the other Germanic languages such as Modern German (Fery 1994, Klein 2000).

capture universal properties and select outputs in a manner which reflect crosslinguistic tendencies as well as predict typological variations. OT's way of capturing generalizations is through conflicting constraints, and an OT grammar of a language is expressed in the ranked order of violable constraints (based on Kager. 1999).

An OT grammar of a human language is defined by a particular ranking of a universal set of violable constraints in a strict dominance hierarchy; a conflict between any two constraints over the selection of a given input-output pairing is resolved by favoring the higher-ranked of the two constraints. Constraints in OT are restrictions that are generally expressed by two types of constraints: *markedness constraints*: (i.e. favoring unmarked structures) and *faithfulness constraints* (favoring preservation of inputs). The function of the grammar is then to resolve conflicts depending on the preferred choices of individual languages.

However, agreement in a lot of OT work has been considered as the result of the faithfulness. In this approach, which assume a correspondence method of analyzing vowel harmony, adjacent output segments are bounded by a correspondence relation. In correspondence based agreement, apart from a correspondence constraint, another agreement constraint also needs to be functional to prohibit disagreement between features. A directional correspondence constraint was proposed by Walker (2000) whereas directional AGREE constraints have been proposed by Pater and Werle (2001).

Therefore, a lot of OT analyses have adopted the autosegmental approach of phonetic spreading. In many, harmony is analyzed predominantly in terms of alignment. Alignment typically requires features to be aligned to the left or right edge of a morphological or phonological domain. This type of alignment constraint demands that the edge (right/left) of a feature be associated with the right/left edge of a category.

Obviously, i-umlaut is regressive assimilation (Direction: Right to Left), since features of the suffix vowel *i* and the glide *j* spread to the

stem vowel. Therefore, the related faithfulness constraint can be:

a. **SPREAD [R]>> ALIGN ([-back, L)

In addition, based on the importance degree of values, I rank other constraints as following order.

b. Ident-IO ([round]): Output correspondents of an input [α round] segment are also [αround]. (ID ([rd])).
c. Ident-IO ([high]): Output correspondents of an input [α high] segment are also [α high]. (ID ([hi])).
d. Ident-IO ([back]): Output correspondents of an input [α back] segment are also [α back]. (ID ([bk])).

How the constraints and their relative ranking proposed up to now work is illustrated in the following tableaux. First, let us look at the word whose stem vowel is /ū/.

(9) mȳs [mȳs]dat. plural form of (mūs 'mouse')

/mūs+i/	*SPREAD(R)	ALIGN([-back], L)	ID (rd)	ID(bk)
a. mūs	*!	*		
b.☞ mȳs				*
c. mīs			*	*
d. mōs	*!	*		
e. mēs			*	*

*SPREAD (R) requires the direction of feature spreading can not be from left to right, and ALIGN ([-bk], L) requires [-back] feature must come to left edge. Candidates (9a), (9d), whose stem values are not

ALIGN ([-bk], L), fatally violate constraints first. Then candidates (9c), (9e), whose features are [-round,-back] fatally violate constraints of ID (rd) and ID (back). So, the (9b) becomes an optimal output since it is the most faithful.

   Now let us consider the case whose input stem vowel is /ō/.

(10) fōet [fØt] dat. plural form of 'fōt (foot) earlier form'

/fōt+ i/	*SPREAD(R)	ALIGN([back],L)	ID(rd)	ID(hi)	ID(hi)
a. fōt	*!	*			
b.☞ fØt					*
c. fūt	*!	*		*	
d. fīt			*	*	*
e. fȳt				*	*

   Apparently, (10a) and (10c) incur the fatal violation of *SPREAD (R) which requires the direction of feature spreading should not be from left to right, and of ALIGN ([-bk], L) which requires [-back] feature must come to left edge. On the other hand, the remaining candidates: (10d) violates ID [rd], and both (10d) and (10e) violate ID [hi] and ID [bk]. Thus, between (10b) and (10e), (10b) becomes an optimal output since (10b) is more faithful than (10e).

   Up to this point and analysis, we have shown that the proposed constraints and their relative ranking in the hierarchy can explain how i-umlaut in OE undergoes fronting of back vowels.

5. Conclusion

I-Umlaut in Old English is a very interesting and special phenomenon,

which exerts huge influence on Modern English. The legacy of umlaut in Modern English is widespread, which can be seen in various aspects, such as so-called irregular noun plurals, comparatives (old/elder), transitive verbs formed form intransitive verbs (sit/set), and verbs formed from nouns (food/feed), etc. Hence, in this paper, I tried to analyze i-umlaut in OE with framework of Autosegmental theory and Optimality theory and then observe how these theories account for the umlaut phenomenon in a more explanatory way.

Autosegmental analysis is one of the most representational approaches to the vowel harmony. Throughout the analysis, I have seen how independent tiers have autosegments that are related to the segmental tier throughout the course of phonological derivations. Besides, the Autosegmental analysis also provides the vivid process that spreading features from the suffix vowel *i* and the glide *j* change the features of stem vowels into forward or forward up.

In addition, I also applied the Optimality theory, currently the most promising framework of analysis, to analyze the i-umlaut. I found that with proposed constraints and their relative ranking in the hierarchy, the phenomenon of i-umlaut can be well explained.

References

Moon, A. N. (2011). I-Umlaut in Old English: A Weak Trigger Effect. *English Language and Literature, 57,* 1043-1065.

Frederic, C. and R. Ringler. (1971). *Bright's Old English Grammar & Reader*. New York: Holt, Rinehart and Winston.

Clements, G. N. (1977a). The Autosegmental Treatment of Vowel Harmony. W.U. Dressler & O.E. Pfeiffer (Eds.), *Phonologica 1976,* (pp. 111-119). Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.

Hogg, R. (1992). *A Grammar of Old English, Vol I: Phonology*. Oxford: Oxford UP.

Roca, I. and W. Johnson. (1999). *A Course in Phonology*. Malden, MA:

Blackwell Publishers Ltd.

Brinton, L. J. and L. K. Arnovick. (2011). *The English Language: A Language History*. Oxford: Oxford University Press, 2nd edition.

Prince, A. and P. Smolensky. (1993). *Optimality Theory: Constraint Interaction in Generative Grammar*. Cambridge: MIT Press.

Kager, R. (1999). *Optimality Theory*. Cambridge: Cambridge University Press.

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