The *U* in English: A Historical Perspective

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Moon, Taesun. 2004. The *U* in English: A Historical Perspective. *SNU Working Papers in English Linguistics and Language* 3, #-#. This study investigates the relationship between the grapheme *u* and the sound /ju:/ by studying the diachrony of the two entities and their intertwined development, based upon the fundamental question of why the two eventually became identical in light of the taxing qualities inherent in the glide /j/ as a constituent of English phonology. The study establishes that a mixture of foreign influences in the form of the French /y/ and functional factors encompassing both perception and production influenced their development since the 15th century in the history of English. Considering the idiosyncratic status of /ju:/ within Present Day English which is due to a confluence of historical and functional factors, /ju:/ rightly deserves a place in the English inventory of diphthongs. **(Seoul National University)**

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1. Introduction

One aspect of English vowels which has not received the notice it deserves in the synchronic literature is the status of the segment[1] /ju:/ which is used to denote the grapheme *u* in English. As evidence of the strangeness of /ju:/, one has only to look at one of its constituent segments, the glide /j/. The /j/, which has received considerable attention, has been variously described as a semi-vowel or glide, and it provides, along with the glide (or vowel) /w/ in English, scholars with something of a conundrum. Both reveal similarities in that they are highly restricted in distribution within the rime, coming only at the head of the nucleus (the /ɪ ʊ occurring at the end of vowel segments are another matter), and they are both relatively restricted in terms

1) Though the status of /ju:/ as a phonological segment, i.e. a diphthong, is highly debatable, I shall argue that it is later on in this article.

of co-occurrence[2] with the onset compared with other pure vowels.

For example, consonant clusters such as *spl-* and *spr-*, though disallowed by the phonotactics of many languages, are possible in English and can be found in words such as *splay, splice, split, splat, spleen, sprite, spread, sprawl,* and *spray.* As can be seen in these diverse examples, complex clusters of three consonants may combine with virtually any vowel in the English inventory. A problem, however, arises when trying to combine these clusters with /j/, */splju:/ and */sprju:/. The same problem occurs with relatively simpler, double clusters with liquids in the second slot such as *fl-* and *bl-*. Thus the pronunciation in English is /flu:/ and /blu:/, not */flju:/ and */blju:/. These problems cannot be completely written off as a clash occurring between a glide and a glide-like liquid such as /l/ or /r/ and /j/ (/w/ presents similar problems) since words such as *lieu* /lju:/ and *value* /væ ɹ:/ are clearly possible in English; though in this case, a possible solution lies in the fact that onsets of two or more onsets terminating in /l/ preclude the occurrence of /j/ directly behind the /l/. Furthermore, /j/ is completely blocked from realizing directly after an /s/ in dialects such as General American, for example, *assume* /ə ɪ:m/ or *hirsute* /hɜ ɹu:t/. Also, in some cases, when positioned after an /s/, /j/ does not become neutralized but instead palatalizes the sequence as in *sure* /ʃ :r/.

This difficult to define segment /j/ constitutes the first half of the segment /ju:/. The combination should not cause any problems if /ju:/ was simply viewed as two disparate segments occurring in succession rather than as a diphthong such as /ɔɪ ɪ , and /aʊ . However, there are a few reasons why it should be viewed as one.

1.1 The status of /ju:/ as a diphthong

The first piece of evidence is that /ju:/ is the only /j/ and vowel segment occurring word-internally in English. Other /j/ combinations such as /ja/ in *yard*, /jæ in *yak*, and /jɔ in *York* occur only word initially. The one other combination which can

2) Borowsky (1986)

occur within a word is [jə found in instances such as *onion* and *million*; however, it cannot be given full phonological status due to the fact that [ə is a phone and not a phoneme. Instances of /ju:/ being used in English have been amply supplied above, and they shall not be further mentioned.

The more conclusive argument comes from the linkage of the segment /ju:/ and the grapheme *u*. In several European languages such as French and German, the names of vowels and their phonological realization are inextricably linked. Though this does not necessary imply that vowel graphemes determine their phonological realizations, it does hint at the fact that graphemes and phonological representations assert a mutually binding influence. Moreover, the names of the English graphemes *a*, *i*, *e*, and *o*, and their counterparts in German and French contain only vowels. Only in the name of *u* is there a glide, a segment which does not exist for the *u* in the other two languages.

Consider, for example, the nonce spelling in the sentence "I luv u" where the grapheme is representative of an entire word. What this says about the status of /ju:/ as a diphthong may require splitting some fine hairs, but as with another grapheme qua lexeme qua diphthong "I" used in the same sentence, this is a case where a grapheme and phoneme converge and reveal its identity. This also arguably demonstrates that the /ju:/ of *u* and /ʌ of *luv* have the same underlying representation since the writers have apparently shortened the grapheme/phoneme into its appropriate form in this nonce construction. Through an interesting reversal of influence, the grapheme is binding the phoneme into a single entity in the perception of its speakers. What would have been impossible to write down in past stages of English has now been made possible through the creativity of its users, and this is ultimately attributable to the fact that /ju:/ is not an awkward segment joining two disparate, unruly elements in English, as one would find in a segment such as /əʊəʊ in the word *oophorectomy* /əʊəʊ ə ɛ ə ɪ which no one would argue is a single entity; it is an undeniable diphthong of the modern English inventory. It is a basic tenet of modern day generative linguistics that its subject is the competence of speakers, the underlying syntactic and phonological underlying structures and the rules which work upon

it to determine the ultimate performance. Within this framework, the grapheme has no relevance, and in an age when illiteracy rates among the population was immeasurably high, this is indisputably true, but when the ability to read becomes more widespread, to say that there is no interchange of influence between writing and speaking is a position open to debate. Though this study cannot provide any conclusive bearing upon the matter, it is hoped that it can give prominence to a field worth exploring.

1.2 The /j/ in /ju:/

The question arises then of where this slightly troublesome glide came from, i.e. how it was derived historically. This shift from synchronic to the diachronic is necessary because virtually all the *u*'s existing in the English lexicon when either in an open syllable or in a position followed by an optional single consonant and a vowel becomes /ju:/ regardless of tonality, whether it comes in the pretonic, tonic, or posttonic position (e.g. *utility* /ju:tíɪɪ , *accuse* /ə ú:z/, *argue* /árgju:/). This is clearly a problem which requires a diachronic solution since it is clearly an instance of "lexicalization", i.e. where a previously rule based phenomenon has become established as an anomaly, on a much smaller scale. That a vowel grapheme becomes a realization of its name, i.e. *you*, when in such positions is not strange in itself when compared to the other four vowels, namely *i* /aɪ , *e* /i:/, *a* /eɪ , and *o* /ou/ in *bite, mete, date,* and *dote*. What is strange is that while the rest of the vowel graphemes represent a single tense vowel or two lax vowels in the case of *i, u* is a combination of a glide and a vowel.

A survey of the Great Vowel Shift will put this anomaly into perspective.

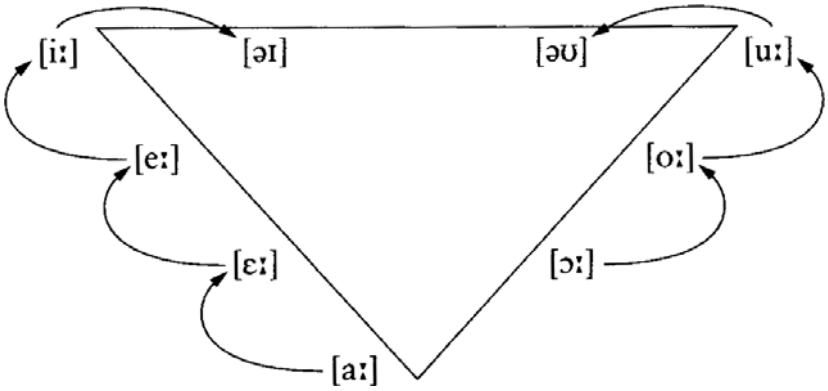

Figure 1. The Great Vowel Shift

Following the Great Vowel Shift, all the cardinal long vowels in English shifted upwards: /a:/ → /e:/, /e:/ → /i:/, /o:/ → /u:/[3]. The highest vowels, /i:/ and /u:/, broke and became the diphthongs, /aɪ and /au/. Compare this with the shift in vowel names. Unlike consonant names such as /bi:/ or /kju:/ or /ar/, vowel names are deceptively simple. They are named after their long phonological representations in the environments mentioned above. The same goes for other modern European languages such as French and German[4] (old or dead languages are another matter, as when the ancient Greeks gave them distinct names such as *alpha, ēta, epsilon,* and etc.).

Looking at the vowels excluding *u*, the vowels' present day long representations adhere to the path followed by their diachronic roots in the Great Vowel Shift. The front vowels are more strict in their adherence to this path. The two [-low] vowels undergo a shift in names from /i:/ to /aɪ and from /e:/ to /i:/. The low vowel /a:/ undergoes breaking[5] to become /eɪ but here the first sound

3) The actual Great Vowel Shift was much more complicated but this simplification fully represents the most important changes.

4) The vowels in French are pronounced /a:/, /ɛ , /i:/, /o:/, and /y:/; the vowels in German are pronounced /a:/, /e:/, /i:/, /o:/, and /u:/.

5) The term is used here in the wider sense of diphthongization. If a diphthong is defined as a "vowel where there is a single (perceptual) noticeable change in quality during a syllable"(Crystal 1997), then the instances mentioned clearly are clearly examples of 'breaking'.

in the diphthong corresponds to a lenited version of its Great Vowel Shift reflex and the second sound corresponds to a lenited version of the /e:/ after the Great Vowel Shift has applied. So even /a:/, while problematic to an extent, still does not deviate from the spatial path of its development in the Shift.

The back vowels present a different problem. In the case of *o*, which primarily should have read /u:/, it broke to represent the value of /ou/, which is not highly anomalous considering the slightly erratic behavior of the front diphthongs.. Under the assumption that breaking was inevitable, this can be understood two ways in conjunction with the breaking of *i* and *a*. They are all falling glides, where the first segment receives the most prominence, and they entail a closing of the mouth or, to put it differently, a rising of the tongue. This is understandable if the Great Vowel Shift is perceived as a movement to relax the tension in the mouth by a lenition of tense vowels and a simultaneous reduction in the aperture of the mouth, i.e. drawing the mandible down less.

As to whether they are on-glides or off-glides is an extremely difficult question to answer and possibly a dichotomy that is irrelevant, since it is practically impossible to determine which segment is the 'target'. For example, if *a* and *i* are off-glides, then it cannot possibly mean that the target of /eɪ ɪ is /a/. This is an untenable position when seen in the light of phenomena such as trisyllabic shortening or *-CiV* shortening, e.g. *divine/divinity, profane/profanity*. The same goes for the back vowels. This raises interesting questions such as whether this means that long vowels reside in a separate perceptual space, whether the diphthongs in question do not even have targets or do not require them, and ultimately, the relevance of such a distinction in general.

It is undoubtable that the status of /ju:/ as a diphthong is firmly entrenched in the mind of modern speakers. This makes the question of where the /ju:/ came from and why *u* and /ju:/ became identical even more important. On the basis of the above review of the Great Vowel Shift alone, it seems the present name of *u* should never have existed. To gain better insight into the issue, I shall conduct a survey of studies on the diachronic status of all sounds associated with *u*, the sound /y:/ which had a clear

impact on /ju:/, and the respective status of both for each major diachronic stage in English, from OE to ME, and review relevant issues pertaining to perception and loan word phonology.

2. Vowel systems in English

2.1 The Old English vowel system

Campbell (1959) states that the OE vowel system was normally represented with the following symbols, with each symbol representing both long and short sounds:

Back vowels:	a	o	u		
Front vowels:	æ	e	i	œ[6]	y
Diphthongs:	ea	eo	io	ie	

Table 1. Old English Vowels

He is careful to note that the sounds of any dead language can never be anything more than educated guesses, and that to propose any phonetic value as exact would be a tenuous affair. Nonetheless, when written documents left by an educated clergy or the upper strata of society are all we have to go upon, they must be utilized to the best of our abilities, augmenting any attempts at internal reconstruction of phonetic values with a careful study of related languages. In this case, the front round vowel /y/ has completely disappeared from Present Day English. /y/ was lost early in the development of the language, though the distribution and speed of that loss is uncertain. Due to the reasons above, though it would be impossible to postulate an exact phonetic value, since /y/ was usually a fronting of /u/(here, all phonological representations denote both the long and short variations) in OE, and the unrounding of /y/ is usually /i/, Campbell concludes that /y/ was close[7].

6) Due to the controversial nature of this sound, it shall be excluded from the analysis

7) As to whether the sound was purely determined by morphophonological constraints or existed as a lexical marker is not made clear by Campbell (1959),

2.2 The Middle English vowel system

The vowel system of ME is not as clear cut as OE or EModE, not because ME suddenly became more confused than OE, but simply because more literature reflecting dialectal variations exist. For example, the Southwest Midland Dialect which had some influence upon the Southeast Midland Dialect and hence ModE had a vowel inventory with many sounds which are in disuse today: /i/, /y:/, /ø , /ɛ ɔ ɔ , /o:/, /u/, /ɨ/, /ei/, /au/, and /uɔ (Jordan 1974). A more diagrammatic representation he gives which comprehensively reveals the shift in vowels from Late Old English to Early Middle English is as follows:

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but given its disappearance over time, and from the evidence of related languages such as Old High German, it would be credible to assume that it was a morphophonologically determined allophone, which eventually attenuated into complete non-existence by the beginning of ME in most dialects.

[i:] [y:] [u:]
[ɪ ʏ [ʊ
[e] [ə [o] [e:] [o:]
[æ [æ
[a] [ɑ

Figure 2. Late Old English West Saxon short(left) and long(right) vowels

[i:] [y:] [u:]
[ɪ ʏ [ʊ
[ə [e:] [o:]
[ɛ [ɔ [ɛ [ɔ
[a] [a:]

Figure 3. Early Middle English Southern dialect short(left) and long(right) vowels

For the discussion at present, as a matter of simplicity, the ME vowel system will be regarded as having the same system as the EModE system, which I will be reviewing next.

2.3 The Early Modern English vowel system

2.3.1 Dobson(1968)

According to Dobson (1968), there were five short vowels and eight long vowels in the inventory of Early Modern English. The short vowels were /a/, /e/, /ɪ/, /o/, /u/ and the long vowels /a:/, /ɛ:/, /ɪ:/, /ɔ:/, /o:/, and /u:/. Besides monophthongs, he lists the diphthongs /aɪ/ or /æɪ/, /au/, /ɛu/, /eu/ or /ɪu/, /ou/, and /oɪ/ or /uɪ/. Along with these sounds he lists one other controversial segment, the /y:/, which developed in southwestern Saxon dialects from various native sources and/or was used as a substitute for old French and Anglo-Norman /y/ in Romance words. The existence of this sound in the EME inventory is a point of controversy, and Chomsky & Halle (1968) and Jesperson (1956) strongly doubt its relevance and frequency to give it prominence in the inventory, but given the evidence cited by Dobson from the orthoepists he studied, it seems a relatively safe

assumption to say that this sound did in fact exist in the vowel inventory of speakers at the time. Among those cited, Ellis claims that /iu/ developed from /y:/, appeared beside it in the first half of the seventeenth century or perhaps earlier, and that /y:/ went out of use at about 1650. Others state a difference in the influence between the two, or that they were independent developments, and the overall picture is one of general confusion with a marked lack of coherence. The dominant view, however, and heralded by the scholars mentioned above, is that /y:/ died out around 1500 and was completely replaced by the single sound /iu/. The one certainty is that during this period, the sounds /y:/ and /iu/ were closely associated with each other which could have resulted in free variation between the two, phonologically or morphologically determined variation, or a derivational relationship; none of which are possible to verify at the moment.

One striking feature of Dobson's analysis is his claim, which is based on quite unequivocal evidence, that /y:/, /iu/, /eu/ (another sound equated with these sounds) were identical. Dobson is not clear on what he implies by identical, and the only hint at a definition he gives is that, "The best orthoepeists make no distinction whatever between them." (1967:701) Since the phonological representations above are actually only approximations derived from the philological representations *u*, *iu*, and *ęu*, it is impossible to assess whether the three sounds were truly identical in terms of all phonological features or whether they were identical in the sense that though they were phonetically different, the sounds were never used to denote any lexical difference in meaning. The latter seems more probable given Dobson's treatment of John Hart's work, noting Hart's lack of usual perspicacity in his confused description of /y:/ and /iu/, attributing this to a probable confusion from knowing two pronunciations of ME /y:/ which he did not properly distinguish. Whichever is the case, he gives ample evidence that /y:/, /iu/, and /eu/ were closely associated, interchangeable, and possibly identical sounds during that stage in the history of English.

The most notable development described by Dobson is the transition from /iu/ to /ju:/. Given the evidence in Dobson, /iu/ should have existed in English from the beginning of the sixteenth

century at the latest. This sound probably developed into /ju:/ by the last decade of the sixteenth century at the earliest, and during this inchoate stage, it was most common in word initial position. This sound became fairly common after 1640 but was still in a relegated status, /iu/ being preferred in careful speech, until the late seventeenth century when it gained a firm footing in all registers.

2.3.2 Chomsky & Halle(1968)

Chomsky & Halle (1968) building upon Dobson's study, give the same vowel inventory for EModE (or late Middle English in their book; the sounds are all from before the Great Vowel Shift):

TENSE		LAX	
ī *time*	ū *town*	i *ship*	u *cut*
ē *meet*	ō *goose*	e *bed*	o *dog*
ǣ *mean*	ɔ̄ *boat*		
ā *hate*		a *man*	

Table 2. EModE monophthongs

They also posit the following diphthongs:

DIPHTHONGS		
ǣ *day, maid*	ɔ̄ *point*	ēw[8] *new*
ǣ *dew*	ɔ *blow, know*	ā *law, draw*

Table 3. EModE diphthongs

It can be seen from the above examples that Chomsky & Halle did not regard /y:/ as among the inventory of that period. At the moment, let it suffice to say that while /ēw/ is posited, they do not regard another influential sound in the history of /ju:/, /iu/ as part of the inventory, which is untenable given the evidence they claim later in the same section.

8) /eu/ in Dobson (1968)

ME	ī	ē	ǣ	ā	ɔ̄	ō	ū
	↓	↓	↓	↓	↓	↓	↓
Hart	ey	ī	ē	ā	ō	ū	ow

ME	ēw	ǣ	ǣ	āw	ɔ̄	ɔ̄
	↓	↓	↓	↓	↓	↓
Hart	yu	(y)ēw	ēy	āw	ōw	ōy

ME	i	e	a	o	u
	↓	↓	↓	↓	↓
Hart	i	e	a	o	u

Table 4. The vowel shift in John Hart

The above is their summarization of John Hart's observations on the vowel shift which was occurring at the time and hence was amenable to direct comprehension and analyses by contemporary orthoepists. One phenomenon of note is the transition from /ēw/ to /yu/. Though possibly disregarded by the Chomsky & Halle, it should be noted that the philological symbols used by Hart could have denoted both /iu/ and /ju:/. Considering that a direct transition from /ēw/ to /ju:/ would have been highly unlikely considering that /ē/ was too low for direct conversion to /j/, the sound /iu/ would have to posited as an intermediary and a sound existing at the period for the inventory cited by Chomsky & Halle to have any substantial weight in any scholarly analyses. Some of the other sound changes concerning /eu/ (to return to the original phonological representation) described by seventeenth century orthoepists are as follows.

John Wallis gives the following:

ME	ēw	ǣ	ǣ	āw	ɔ̄	ɔ̄
	↓	↓	↓	↓	↓	↓
Wallis	iw	(y)ēw	ǣ	ɔ̄	ɔ	ɔ

Christopher Cooper's study has a considerably different account:

ME	ēw	ǣ	ǣ	āw	ɔ̄	ɔ̄
	↓	↓	↓	↓	↓	↓
Cooper	yuw	yuw	ē	ɔ̄	ō	ɔ

Lastly, T. Bachelor gives a description which coincides closely to Cooper's:

ME	ēw	ǣ	ǣ	āw	ɔ̄	ɔ̄
	↓	↓	↓	↓	↓	↓
Bachelor	yuw	yuw	ey	ɔ̄	ow	ɔ

As can be seen from the above examples, the development of /ew/ or /eu/ and /ǣ / (for some orthoepists) in part converges towards a sound which is in the middle of the stage towards completion at /ju:/. Whether it is prudent to ignore the existence of /iu/ may be a slight matter which, seen from a viewpoint encompassing the entirety of /y:/ to /ju:/, might not merit close scrutiny, nonetheless leaves open the question as to the exact time frame for which we should assume the existence of /iu/ in the inventory and thereby coming up with a more complete picture within this murky domain.

It is clear beyond doubt that /eu/ or /iu/ (whichever sound was most prevalent immediately before the Great Vowel Shift) was the immediate precursor to /ju:/. Two questions must then be raised in relation to this paper. How did /ju:/ settle to become the name of the grapheme *u*? And where did the sounds /eu/ or /iu/ derive from? I will attempt to answer these questions by first examining the influence of the French sound /y:/ in ME.

3. Influences in the development of /ju:/

In this section, I will investigate the French influence in the diachrony of English, the causes pertaining to perception and production which changed /y:/ to /iu/, and tentatively show how and why /y:/ became the sound it is today, without leaning towards any teleological objectives.

3.1 The French influence

It is well known that French has had a considerable influence in the development of English, and all the scholars note the fact (Chomsky & Halle 1968, Dobson 1968, Jesperson 1956), all conceding that the French /y:/ existed at some point in the diachrony of English, if not as a part of the inventory, then at least as a sound which was used by some speakers, not as a part of a regional dialect, but as a consequence of their social hierarchy or occupational status. What most of them fail to note is how this sound was incorporated into English once the rounding element, being most unnatural in English, was lost.

The grapheme representing the /y:/ in Old French was invariably *u*, and when words containing such a segment were first borrowed into the language, the spelling was maintained. Through various causes such as dialectal variation, natural sound shift, the vagaries of time, in other words, all the disrupting elements which made English what it is, these words eventually lost their original sound and changed into the words we know today. What is amazing is that these words underwent a change which shares noticeable commonalities of features and managed to retain traces of the French /y:/ at the root. Especially for words which entered English before the 14th century or before the height of Middle English, they all go through a stage where the unrounding of /y:/; in other words, a change in *u* results in a orthographic representation of either *eu* or *ew* which would be identical to Dobson's (1968) philological representation *eu*. Some examples are given below from the history of the words *duty* (from Anglo-French *dueté*), *duke* (from French *duc*), *stew* (from Old French *estuve*), and *sure* (from Old French *sur-e*). The examples below are given in their citation forms in the Oxford English Dictionary:

<duty>
1297 R. Glouc. (1724) 316 *þ kyng..gret deuyte tolde of hem, vor her gentryse.*
c1430 Lydg. Min. Poems 141 (Matz) *How may this be that thou art froward to hooly chirche to pay thy dewtee*

c1440 Generydes 2016 *He and his ayeris claymeth it of dewte.*
c1485 Digby Myst. (1882) iv. 994 *To do hym reuerence & dewtee*

<duke>
1556 Chron. Gr. Friars (Camden) 7 *The dewke of Norffoke and the yerle of Sorre hys sonne ware comyttyd unto the tower of London*

<stew>
c1400 Mandeville (1839) xi. 131 *It fresethe more strongly in tho Contrees than on this half; and therfore hathe every man Stewes in his Hous, and in tho Stewes thei eten and don here Occupatiouns.*
c1400 Lanfranc's Cirurg. 192 *His bodi schal be well frotide in þ baþ ouþ in a stewe.*
c1460 Towneley Myst. xxx. 350 *Ye lanettys of the stewys, and lychoures on lofte*

<sure>
1471 Caxton Recuyell (Sommer) 108 *Acrisyus..was well eased that his doughter was in so seur a place.*
1506 Kal. Sheph. H ij, *Our shyppe may not enter into no sewer hauen.*

These examples, besides showing that /y:/ eventually underwent a shift which rendered it into the orthographic representation *eu* or *ew*, raise the question of why it became so. Intuitively, a shift in /y:/ which results in a complete assimilation of the sound into the existing vowel inventory should result in the sound /i:/, which is different in only the feature [round], or /u:/ which differs only in frontness. Instead, it became /iu/ which maintains all the features of /y:/, the only difference being that all the features in /y:/ have been distributed over a temporal domain so that the first segment in /iu/ retains the frontness and the second feature retains the roundness with the feature [+back] being added into the entire

sequence. This is an issue which I will discuss later in relation to perception.

It also casts doubt on the phonetic value of the grapheme *e* or *ę* in Dobson's (1968) notation. Assuming that the assimilation of /y:/ into English was directly followed by the breaking of that segment into /iu/, it must be presumed that the phonetic value of *ę* was a higher vowel than presumed by Chomsky & Halle(1968)[9] and that it was much closer to the /ɪ of Present Day English. Conversely, it could also be argued that the fronted /y:/ was lower than the one existing in French or German and the unrounding of this sound would be closer to /eu/. However, the latter possibility seems more unlikely than the first since there were three front vowels up until Early Modern English (/ɛ /e/, /i/) contrasted with the two front vowels (/ɛ ɪ of today, and a lowering of /y:/ to a position closer to /e/ after it was fronted would burden an already overpopulated section.

The problem is even more interesting when considered in the context of the Great Vowel Shift. If, as surmised, the /y:/ in words which had been imported prior to the 14th century had undergone some type of assimilation into a monophthong like /i:/ or /u:/, it would have been subject to the Great Vowel Shift and therefore any trace of a French etymon would have been expunged from the words above. However, many of these words went through an orthographical stage containing *eu* or *ew* and later reverted to the *u*. To say that the speech community of the time opted for a different assimilation strategy just so it could evade the influence of the Great Vowel Shift would be ludicrous, but to argue that breaking occurred instead of total monophthongal assimilation because such words existed in a separate register, whether due to prestige or simple foreignness, and was therefore assigned to a diphthong which had hitherto been unknown in the ME vowel inventory seems quite plausible. Such an analysis would require not only a low-level textual analysis of coeval data but also a survey of commentary literature on what language users thought or had observed of the language of their times. If such an analysis is proven applicable even to a slight extent, it would be a fascinating

9) /ēw/ in their notation

instance of register or prestige influencing sound change, a phenomenon which would require a redefinition of sound change from a purely linguistic phenomenon to a socially defined, real-world constrained occurrence.

To return to our main point, there can be little doubt that /y:/ was subject to breaking in the narrowest sense to /iu/ and that this phenomenon became widespread since the beginning of the fifteenth century, based upon the evidence from the Oxford English Dictionary. Though the exact trajectory of the change is impossible to fathom at this point and would require the augmentation of sociolinguistic studies, it is quite certain that the two sounds are diachronic variations of a single element. The conclusion at this point is that the grapheme *u* was more closely related with the sound /y:/ and its variant /iu/ than /u:/ (which would have made it subject to the Great Vowel Shift) in the period before the Great Vowel Shift. This is in spite of the fact that native English had a grapheme sequence, *eu* and *ew*, which was pronounced /iu/ and which would have had a minimal influence on the development of /ju:/ due to its lesser frequency.

3.2 Considerations of production and perception

In this section, I will deal with the transition of /y:/ to /iu/, and the transition of /iu/ to /ju:/ with a focus on perception and production. Before going any further into the matter of production and perception, a diagrammatic representation of the diphthongs existing at each historical stage of English is presented to put the issue into perspective.

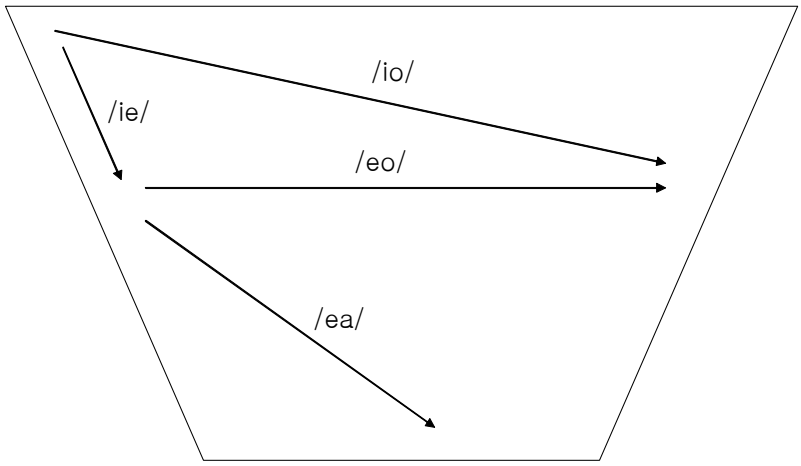

Figure 4. OE diphthongs

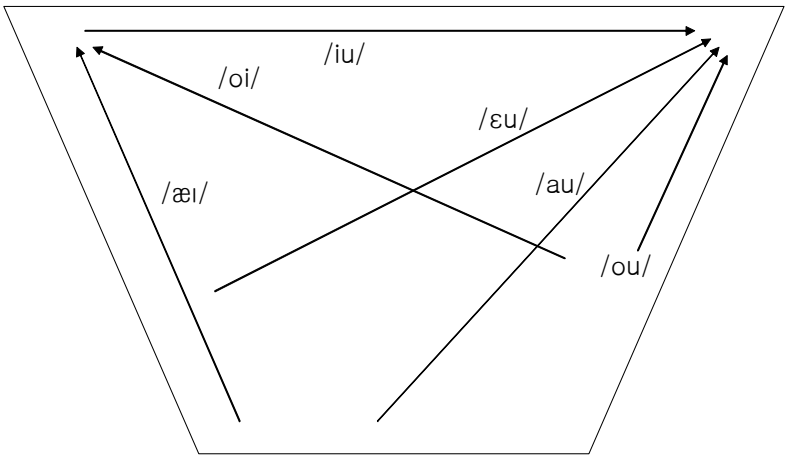

Figure 5. ME diphthongs

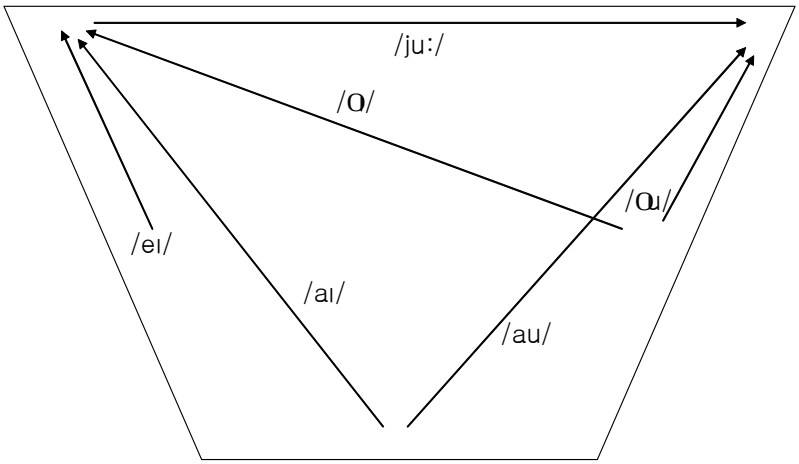

Figure 6. ModE diphthongs (General American)

Looking at the diagrams, there arises a clear distinction between the vowel system of Old English and that of later states. Disregarding a time gap of centuries and the fact that it has been oversimplified without adequately representing the varying dialects, the miniscule chronological shifts, and any slight phonological variations within a synchronic dialect, it nonetheless reveals a lacuna associated the phenomenon under discussion, i.e. the lack of a diphthong bordered by high vowels in OE in addition to the fact that OE had no diphthongs which made a back vowel its starting point. From a functional perspective emphasizing maximization of contrast between all existing segments in a intralanguage inventory most recently proposed by Boersma (1997) and Flemming (2001, 2003), a sound which requires lexical distinction (though not to imply any teleological purpose on the part of the sound itself or the speech community) would most likely shift to occupy a relatively sparsely populated section.

Because the work of Boersma and Flemming focused on the contrastiveness of monophthongs, I have built upon their work and devised the following simplified method for quantifying the contrastiveness of a dipthong. The phonological symbols I have used for the cardinal vowels have been simplified and it is to

present a way to quantify contrastiveness in future studies. However, the two most important vowels in question, /i/ and /u/ are adequately represented and should not present a problem for the present discussion.

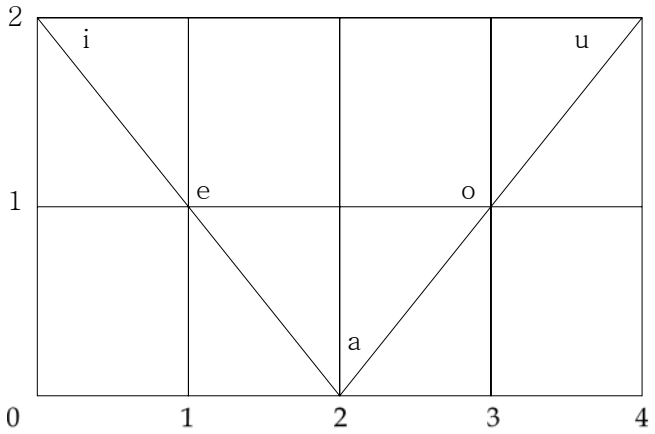

Figure 7. Coordinate space for cardinal vowels

The above coordinate space is only two dimensional but it should be noted that it is a three dimensional space with one axis, the axis representing rounding, omitted due to the difficulty of depicting it. The contrastiveness of a diphthong is calculated using the simple Pythagorean theorem concerning the relation of the two sides of a triangle and its hypotenuse. For example, a diphthong such as /eu/ would have a basic contrastiveness of $\sqrt{10}$ from $\sqrt{3^2+1^2}$. Since /u/ is a rounded vowel, and rounded vowels are given an extra coordinate in the rounding axis, the final contrastiveness would be $\sqrt{11}$ from $\sqrt{3^2+1^2+1^2}$. All possible combinations of diphthongs from this inventory and their quantified ranks will not be given due to spatial constraints. It should simply be noted that within this framework /iu/ has the highest contrastiveness of $\sqrt{17}$.

It must be pointed out that the contrastiveness of diphthongs is several times greater than monophthongs and their use as lexical

discriminators is highly merited. Diphthongs, compared to monopthongs, comprise more slots in a timing tier and are composed of two distinct elements as opposed to a single monotony, leaving more room for variation within the composition of a set of diphthongs and endowing an unmistakable distinctiveness with monophthongs. In the case of a glaring vacancy such as /iu/ in an inventory, it would only be natural in the Darwinian sense for a language to take advantage of the sound.

The only reason there are not more diphthongs in a given vowel inventory is because of constraints on production which invariably favor simplicity over relatively more taxing diphthongs. In the case of a diphthong such as /iu/, the precursor of /ju:/, the two maximally distinct vowels in the English inventory are combined, and are in this sense most effective in achieving perceptual clarity based upon the above calculation and also upon work by Flemming (2003). For Flemming as well, /i/ and /u/ are the most distinctive pairs in a vowel inventory. /i/ is a front unrounded vowel and /u/ is a back rounded vowel, making them polar opposites; but they are also polar opposites in terms of purely physical qualities, with /i/ having the highest frequency and /u/ the lowest. This sound, had it survived, would have been the most distinctive sound among English vowels in that it takes more time to produce than any other sound (since it contains no glide) and it combines two maximally contrastive elements.

The reason it did not survive into ModE is due to constraints on production; it was too long. If the orthoepists were accurate in their description of this sound, it would have been a single juxtaposition of two lax vowels, a combination which exists in no other known English diphthong. Positing that the English vowel system adjusted this sound to allow maximal ease of pronunciation within the bounds defined by perceptual clarity through a process analogous to natural selection (Boersma 1997), a possible solution is reducing either of the constituent vowels into a glide or reducing the final /u/ to a schwa. Reducing /i/ to /j/ and lengthening /u/ to compensate for the loss in timing slots, which is what actually took place, was one possible strategy among the options employing a glide. The other strategy, where /u/ is curtailed and /i/ is lengthened to compensate, was not chosen, though it might

seem a perfectly legitimate solution. One reason is that there is no diphthong in English which starts with an /i/ either long or short. This is a curious case where analogical extension of phonological properties and physiological constraints converge. English diphthongs, as can be seen from the inventories from the 14th century onwards, invariably prefer sounds which terminate with a reduction of oral aperture. This is not the case for many languages such as German, French, Korean, and Japanese which contain a sound that begins with minimal aperture and ends by opening it as wide as possible, i.e. /ja/. These languages also have or maintain variations on /je/ and /jo/, which are impossible sounds within the English vowel inventory. Whether this raising in diphthongs is related in any way to the Great Vowel Shift is a question that lies beyond the scope of this study. The final possibility of /iu/ reducing to /iə ə is not possible in the first case because of the noted constraint in English on vowel lowering in diphthongs, and in the second case because /jə already exists in the inventory and blocks the intrusion of /iu/. A more precise analysis would be that /jə is not an actual phonological segment but a reduced realization of other underlying phonological representations, e.g. /seɪ ə æ ɔ ɪ ə /, and hence /iu/ reducing to /jə would cause it to lose all phonological distinction and its place in the vowel inventory as I argue here. The only possible reflex for /iu/ was /juː/.

4. Conclusion

This study examined the history and interrelation of the grapheme *u* and the phoneme /juː/ in English. Though by no means conclusive, it showed strong evidence that /juː/ and its precursor /iu/ were derived from the French influx of /y/, which explains its anomalous status in English. Also, by considering perceptual and productive factors in phonetics and phonology, it demonstrated why /iu/ could only have become /juː/. Most important of all, a study of the sound /juː/ reveals that it merits a place in the inventory of English vowel diphthongs as much as /eɪ ʊ ɔɪ ɪ ʊ for historical as well as phonological reasons. However, this study is limited by the fact

that a full and comprehensive treatment in terms of philology and functional phonology for the sound discussed through its entire diachrony was not given, considering the scope of the paper. Nonetheless, the main arguments leave little room for alternation with the fine points left for slight adjustments; and ultimately, it is hoped that this study will open more corridors for the study of diphthongs which clearly have an important status in English than in most other languages.

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