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“The disappearance of /r/ in Early Modern English
and what it meant for its neighbours –
a natural diachronic account”

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Marlena Jaklin

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1 Introduction

Nothing endures but change (Heraclitus referred to in: Lass 1997: 325)

The lapse of ages changes all things -- time, language, the earth, the bounds of the sea, the stars of the sky, and every thing "about, around, and underneath" man, except man himself. (Lord Byron 1978:19)

Languages are always in a state of flux. Change affects the way people speak as inevitably as it does any other area of human life. Language purists do not welcome it, but they can do very little about it. Language would stand still only if society did. [...] During the present century, especially as a consequence of recent trends in sociolinguistics, the emphasis has shifted towards a search for explanations. Why do languages change? (Crystal 1997: 330)

Language change may be regarded as an axiomatic principle within the sublunary sphere. If we were to observe the microcosm, that is linguistic sounds, we would immediately see that sounds are equally affected by this continuous fluctuation and change over the course of time. Thus the universal law of constant change is also applicable to the sound system of either the human language as a whole or to any language in particular (Aitchison 1991:16). Despite the fact that language change is inevitable and gradually alters the inventory of language across space and time, many people refuse to accept that there can be no such thing as a perfectly stable language. In fact, change was (and often still is) regarded as the driving force which effects language degradation and decay. Many conservative speakers or so-called "language purists" lament this ongoing process and ascribe it to "inertia and sloppiness of the mind" (Aitchison 1991:4-5). Even if we gave some credence to the language purist's explanation of language change, the key point to bear in mind here would be that "a world of unchanging linguistic excellence, based on the brilliance of earlier literary forms, exists only in the fantasy" (Crystal 1997: 330).

The mere fact that languages are subject to change gives meaning to the profession of historical linguists. For a considerable amount of time much effort was put into finding evidence for language change in the history of a language. By studying documents of the past, historical linguists primarily strove to trace back modern forms to common ancestors. Another key area of research was the formulation of regular and sound laws, describing language change in the manner

of “X > Y”. The core objective of historical linguistics has however shifted from the attempt to give an account of *what* happened to understanding and explaining *how* and *why* a language is as it is today (McMahon 1994:44). So, there are basically three overall questions which should be considered and possibly answered when approaching any phenomenon of language change.

1.1 The aim and scope of the thesis

Needless to say, the thesis shall not deal with language change in general but rather focus on a particular sound, namely the present day English phoneme /r/, as it has had a very lively and interesting history and has been subject to a considerable amount of change in the course of time. Generally speaking, I would like describe how the /r/ was affected by the changing nature of language and how it in turn affected other sounds in its immediate environment. Among other things, I will be particularly concerned with the individual processes that lead to the transition in the history of English from an entirely rhotic language to a language split into a rhotic and a non-rhotic variety (Harris 1994:232; Lass 1983: 70). Besides describing the innovation processes that took place I will also endeavour to find sound arguments in order to be able to explain how and why the /r/ sound underwent a particular change and was redistributed instead of maintaining the status quo. A reasonable amount of time shall be dedicated to issues such as cause and motivation for innovation (the why question) as well as the problem of implementing a new variant (the how question). For that purpose I will draw on selected theoretical approaches which will hopefully cast light on the underlying questions mentioned above.

I would like to start out by giving a general sound description of the group of /r/-sounds or so-called “rhotics”. In particular the issue of phonetic heterogeneity of rhotics shall be addressed. Moreover their shared features shall be determined.

In chapter 3 established views and previous research on the phenomenon of /r/-deletion and insertion shall be reviewed. Selected passages of orthoepic records will be recited as they serve as useful evidence for the dating of the change. In this chapter I will also lay the groundwork for a discussion on the emergence of r-liaison (i.e. linking and intrusive /r/).

In chapter 4 the theory of “Natural Phonology” will be introduced. First of all general theoretical assumptions of this theory shall be laid out and connected to other general principles (such as the “principle of least effort”). Essentially, the theory shall provide us with useful insights on how and why the /r/ sound developed the way it did. Moreover, the issue of actuation and implementation of the change shall be tackled. I will also argue for the context-sensitivity of /r/-loss and /r/-insertion respectively.

Chapter 5 will comprise an empirical study on Luick’s “r-Wirkungen”. In the survey, the focus will shift to the vowels preceding historical /r/. As the processes of /r/-deletion and r-influenced vowel change go hand in hand it is sensible to take “r-Wirkungen” into account. Basically, I will test Luick’s predictions on the influence the /r/-sound is said to have on its preceding vowels by replication his study. The study will hopefully shed light on the alleged universality of Luick’s sound laws.

2 “Rhotics” - a very general sound description

The realization of rhotics is generally highly heterogeneous¹. It has even been claimed that the only consistency of rhotics “seems to rest mostly on the historical connection between the subgroups and on the choice of the letter <r> to represent them all” (Ladefoged and Maddieson 1996:245). Thus, it is probably a matter of convention that led to the grouping together of /r/-sounds in the literature. In western orthography, which derives from the Greco-Roman tradition, a wide phonetic variety of sounds are represented by the letter <r>.

According to Dickey-Walsh (1997:13) the diversity of sounds that is summed up by /r/ has not come under scrutiny in philology for along time.

Table 1: Overview of Rhotic Types (Dickey-Walsh 1997:14)

	Dental	Alveolar	Retroflex	Uvular
Trill	ʈ	ɽ	ʂ	ʁ
Tap or Flap	ɽ	ɽ	ʂ	
Approximant		ɻ	ɻ	ʁ
Lateral flap		ɻ	ɻ	

However, with regard to phonological patterning some generalizations can be made for all /r/-sounds. For example, rhotics tend to occupy the same place in syllable structures of different languages. In clusters they surface close to the nucleus and tend to become vocalized or disappear altogether. Besides, most of them share some acoustic peculiarities (Lindau 1985:157-8).

In phonological terms the consonants /r/ and /l/ are usually referred to as liquids and due to their phonetic resemblance we may anticipate a similar behaviour in their diachronic development (Giegerich 1992:94). In contrast to the semivowels /j/ and /w/, which possess vowel-like qualities, liquids can be classified as clearly consonantal, indicating a degree of obstruction in the vocal tract whenever the /r/

¹ As stated by Mona Lindau (1985:157) about 75% of all languages posses some kind of /r/ phoneme. The majority of them contain a single form of /r/. Moreover, around 18% of all language, such as Present day English, Dutch and German (to mention a few) distinguish between two or three rhotics.

is produced. In the case of /r/, obstruction is manifested by radical narrowing of the vocal tract whereas central contact is the case for the production of /l/. The second phonological feature of liquids is sonority, that is, their 'phonetic content is predominantly made up by the sound waves associated with voicing' (Giegerich 1992: 93). Thirdly, the liquid /r/ can be characterized as a continuant, a sound which does not block the air stream in the oral cavity when being produced.

Generally speaking, rhotics are lingual segments. With regard to their place of articulation, the following can be stated. While coronal rhotics are produced at the dental, alveolar, palato-alveolar and retroflexed positions of the vocal tract uvular rhotics involve the tongue dorsum and the tongue root in addition to the uvular. Studies have shown that the use of palatal and palatalized rhotics is relatively scarce (Dickey-Walsh 1997:15).

As concerns manner of articulation of rhotics, the literature suggests the following: Within the group of rhotics, five different manners of articulation can be discerned: trill, tap, flap, approximant and fricative. Statistical estimations show that trilled /r/ represents the most common type of rhotic cross-linguistically (40,7%). Taps and flaps are hardly ever distinguished from each other. Yet, there seems to be one articulatory feature that sets them apart. It has been observed that tapped /r/ involves the raising of the tongue, a short contact with the alveolar ridge and then the tongue remains in a resting position. Flapped /r/, on the contrary, requires a retracting of the tongue so that it will strike the alveolar ridge while moving forward and back down (Catfort 1977 quoted in Dickey-Walsh 1997:15). As taps and flaps are not always considered to be different allophones they were also grouped together in the survey that calculated their relative frequency of occurrence. The database shows that they have a salience of 40.1% among languages worldwide (ibid). Although approximants represent the dominant group of rhotics in English, they turn out to be relatively rare cross-linguistically with only 7,2% of all tokens. All in all, 74,9% of all languages in the database prove to have at least one rhotics (ibid).

Giegerich (1992:23-4) labels English /r/s as predominantly post-alveolar with regard to their place of articulation. At the same time he notes that /r/ is 'subject to

considerable variation' in the different dialects of English. Hence, the characterization of the English linguistic variable /r/ is not as straightforward as one may presume.

As this letter is but a jar of the tongue, sometimes against the roof of the mouth, and sometimes at the orifice of the throat, it is the most imperfect of all the consonants (Walker 1791 cited in Harris 1994:230)

This remark was first published in 1791 when John Walker tried to elaborate on the existence of two different types of r-sounds namely, “rough” and “smooth” /r/. The comment already indicates how problematic the characterization of this particular linguistic variable is.

Equally, Lindau (1985: 158) affirms the phonetic heterogeneity of Present Day English /r/ sounds. She continues to state that “a wide variety of manners and places of articulation is exhibited by the class of rhotics”. Furthermore Lass (1977:7) emphasizes the “phonetic problem” of characterizing segments written with /r/. Accordingly, speakers of Scottish English typically pronounce /r/ with a trill and as far as the physical basis for the production of the trilled /r/ is concerned, “sufficient air stream is required” (Catford 1988 et al. quoted in Barry 1997:27) and the tongue blade and tip are pushed up towards the “dental-alveolar-palatal region”. Even though Scottish English may be the most salient example in which a trilled /r/ occurs Romaine (1978:145) claims that the trilled version is not as frequently used as it is generally imagined.

Other realizations of /r/ such as non-approximant /r/, usually referred to as obstruent /r/, are very often regionally and sometimes also socially restricted. An example for the use of obstruent /r/ which is produced by an alveolar tap instead of post-alveolar would be South African English. Roger Lass (1997: 205) claims that obstruent /r/ as a very distinctive feature of the South African English variety evolved due to contact with Afrikaans/Dutch.

Obstruent /r/ and trilled /r/ are only two examples of the wide spectrum² of /r/ realizations. In most British English accents, however, /r/ is produced as a voiced

² Berry (1997:35-35) also mentions uvular /r/, retroflexed /r/, taps and flaps as prominent allophonic representatives of the phoneme /r/ within the English language continuum. Catford

alveolar or post-alveolar approximant [ɹ]. Additionally, tapped [ɾ] remains a common allophonic variant in many parts of Northern England, Scotland and Wales.

The fact that rhotics vary considerably in both place and manner of articulation induced linguists to investigate the shared features of /r/-allophones. Despite the existence of a dense body of studies on the class membership of rhotics from a phonetic and/or phonological perspective their shared features remain somewhat unknown. One argument that has been made is that each member of the class of rhotics shares certain features with other members of the class, but not necessarily the same properties with all. Instead rhotics are said to have a so-called “family resemblance” with each other rather than a strict set of shared properties (Wittgenstein 1958 quoted in Lindau 1985:166). Another suggestion is that rhotics can only be grouped together if their phonotactic properties and their position on the sonority hierarchy are taken into consideration. Thus, a rhotic can be defined as such if it is more sonorous than a lateral consonant but less sonorous than a vowel (Wiese 2001:360).

Since a detailed phonetic characterization of the different varieties of /r/ realization is not the scope of this thesis I shall not go into further detail and leave it at this with the assumption that all Present Day English /r/-variants must be seen as the result of earlier sound changes affecting a sound that once had a single value (cf. Lass 1983:67ff.).

(2001: 172) mentions molar /r/, a common type of American English /r/, as an additional variety of /r/.

3 English /r/ - established views and previous research

Essentially, present day English dialects can be divided into two major categories³ with reference to the distribution of the phoneme /r/. Textbook accounts generally distinguish between rhotic varieties on the one hand and non-rhotic varieties on the other.

In rhotic dialects, the phoneme /r/ surfaces in all possible phonological contexts (McMahon 2000: 232). Thus, the /r/ is pronounced:

- word-initially, e.g. *raw, rat, run*, etc.
- intervocalically, e.g. *very, hurry, Mary*, etc.
- finally, e.g. *hair, for, year*, etc.
- in clusters, e.g. *grade, card, corn*, etc.

In a nutshell, /r/ is articulated whenever it is orthographically present. In terms of spatial distribution Southwest England, some parts of West Lancashire, Scotland, Ireland, most of the United States, Canada, some Caribbean varieties as well as some parts of the South Island of New Zealand⁴ are rhotic today (Wells 1982: 213)

By way of contrast /r/ is not pronounced in all phonological contexts in non-rhotic “world Englishes”. Generally speaking, /r/ of non-rhotic varieties only appears before vowels, which means that it surfaces

- initially and prevocalically e.g. *raw, grade*, etc.
- intervocalically e.g. *very, hurry, Mary*, etc.

At the same time, the /r/ is not produced in pre-consonantal (e.g. *card, corn, horse*, etc.) and pre-pausal contexts (*hair, for, year*, etc.) in these varieties (McMahon 1994:74). It is generally recognized that varieties found in large parts of England, Wales, parts of the United States eastern seaboard and Gulf coast and the later colonies such as South Africa, Australia and New Zealand lack the articulation of “postvocalic /r/”.

³ Harris (1994:231 ff.) however distinguishes between 4 major r-systems by drawing on an element based phonology based on phonological licensing.

⁴ the variety spoken in parts of Otago and the Southland area of New Zealand is often claimed to be the New Zealand’s only regional dialect, because of the presence of ‘Southland/r/’ i.e. rhoticity. This is usually attributed to the high proportion of Scottish (and therefore rhotic) settlers in that area (Hay & Sudbury 2003: 40)

According to Giegerich (1992: 62) it can be particularly misleading to refer to “postvocalic /r/” when trying to defining the context of /r/ since the term does not indicate whether the focus is directed to an intervocalic context (such as in *very*, *hurry*, etc.) or to a pre-consonantal/ pre-pausal context (such as in *car*, *card*, etc.). Instead he suggests taking the syllable position of /r/ into consideration.

As for the concept of syllable structure, it is important to mention that a syllable consists of an onset and a rhyme. The rhyme can again be divided into two sub-categories: the nucleus and the coda. Both onset and coda, which may consist of any consonants, are optional elements of a syllable while the nucleus is mandatory and must consist of at least one vowel or other sonorant⁵ (Giegerich 1992: 138).

Figure 1: The structure of a syllable (Gimson 2001:51)

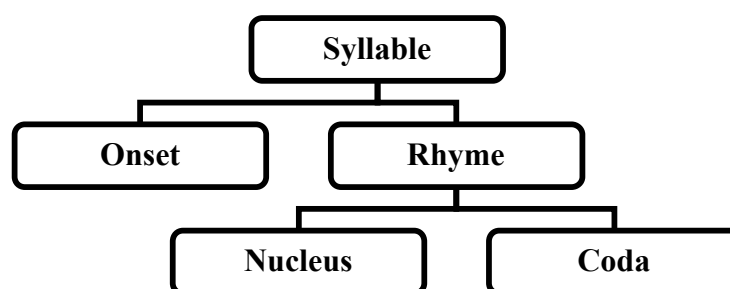


Table 2: Possible syllable positions of the /r/

onset	nucleus	coda	onset	nucleus	
/r/	/aɪ/				<i>rye</i>
/tr/	/ɪ/	/p/			<i>trip</i>
/h/	/i/	/r/			<i>here</i>
/ʃ/	/ɔ/	/rt/			<i>short</i>
/v/	/e/		/r/	/ɪ/	<i>very</i>

Adapted from Giegerich (1992: 62)

⁵ While nuclei of English words exclusively include vowels, there are languages that also show other sonorants in the nucleus. An example may for instance be given by the Croatian toponym *Krk*.

On the basis of table 2 it can be seen that the /r/ appears in two different syllable positions, namely onset and coda. Just like in the case of *rye* and *trip* the /r/ of *very* occurs in the onset position which is due to the fact that it starts a new syllable. However, the /r/ in *here* and *short* has a different position within the syllable and may be labelled as syllable coda-/r/. In this context it is important to mention that it is the coda-/r/ of a syllable rhyme which fails to manifest itself in non-rhotic accents whereas this does not hold true for rhotic accents.

Synchronically speaking, the differences between rhotic and non-rhotic varieties are determined by the presence or absence of coda /r/. At the same time both McMahon (2000:232) and Giegerich (1992:63ff.) point out that the vowel inventory may also differ significantly between the various varieties of English and that this may be partly due to the influence of coda-/r/. For instance in the case of rhotic Scottish Standard English it can be observed that all the vowel phonemes which may be found before /r/ and those vowels occurring before any other consonants or in final position are more or less homogenous. Thus, a phonologically identical situation can be noticed in the vowels of *bee* and *beer* which are generally pronounced as /bi/ and /bir/ in Scottish Standard English (McMahon 2000:232). Conversely this does not apply to RP, where a pronounced contrast, both in terms of quality and quantity, between the two vowels phonemes under consideration exists. While the vowel in *bee* is realized as a long /i/- sound the vowel which surfaces in the word *beer* is pronounced with the centring diphthong /iə/ in RP. Another example for this phenomenon in SSE could be demonstrated by comparing the words *hay* and *hair* which share the feature of close /e/ and are pronounced as /he/ and /her/ (McMahon 2000:232). Moreover /r/ causes a number of differences between the two standard varieties English English (RP) and Scottish English. RP, for example, makes use of a number of additional vowels which do not occur in the vowel set of SSE. One common discrepancy between the two varieties involves the long mid central vowel /ɜ:/, which is the phonetic product of an assimilation between the phonemes /u/, /ɪ/ or /ε/ and coda /r/ in RP. Yet, there is no such sound merger to be found in SSE with the result

that a phonemic contrast between the vowels in *word*, *bird* and *heard* is usually retained⁶ (McMahon 1996: 61).

Since coda /r/ causes a different set of vowels among the various English varieties it can be argued that it constitutes a particularly influential sound within the English sound system and therefore warrants closer investigation. However, for the moment let us leave synchronic interpretation behind and view the whole phenomenon from an historical perspective.

3.1 A diachronic account of /r/-related sound changes

It is generally recognized that “non-rhoticity is innovative” (Lass 1997:282) which of course implies that all English dialects must have been rhotic once. What happened was that at a particular time in the history of English a number of dialects were affected by processes which eventually caused the loss of syllable coda-/r/. The consequence of this loss is the redistribution of the phoneme /r/ within the phonological system of the language.

Although the innovative zero-alternant had only been implemented in the non-rhotic varieties, Jespersen (1909:318) maintains that historical /r/ was affected by lenition processes across all varieties. He further assumes that up to the Middle English period /r/ was realized as a trill in all syllable positions but then the sound was weakened to a tap, next to an approximant and only then /r/ was omitted and only in certain context.

As mentioned above, the absence of /r/ can only be spotted in a geographically restricted area spanning the South of England and the later British colonies which were founded between the end of the seventeenth century and the beginning of the eighteenth century. This clearly sheds light on the chronological sequencing of coda-/r/ dropping which must have been accepted and fairly frequent among speakers of the target varieties by the time permanent settlement in the later colonies of the British Empire had started, otherwise the novel variant could not

⁶ Giegerich (1992: 63) however points out that sporadic loss of contrast between the vowel phonemes in *bird* and *heard* or *word* and *bird* might indeed occur in SSE as well. So the phonemes /ʌ/, /ɪ/ or /ɛ/ tend to be unstable in the context of coda /r/.

have diffused among geographically remote areas such as Australia, New Zealand or South Africa (ibid).

In handbook descriptions the sound change is usually summarized as follows:

$/r/ > \emptyset / _\{C \text{ or } \#\}$ (Harris 1994:238; Lass 1997:282; McMahon 1996:40)

Thus it is assumed that at some point in the history of English there must have been a state A, in which the /r/ was present everywhere, which transformed into state B, in which the /r/ disappeared if it was followed by a consonant or pause. This standard reconstructive description obviously has its shortcomings as it does not clarify which processes were operating behind the arrow symbol. For the time being it remains somewhat unclear how and why the “miracle” of /r/- loss actually came about.

April McMahon (2000:234) points out that non-rhoticity emerged via three sound changes which are commonly labelled pre-/r/ breaking, pre schwa laxing and /r/ deletion. However, there seems to be some controversy among the (historical) linguistic community concerning the interdependence and sequencing of these three sound changes. While some scholars consider these processes to be mutually constrained and successive, others claim that we are dealing with “three entirely independent developments” (Wells 1982: 215; McMahon 1994: 74).

To begin with, pre-/r/ breaking, which presumably emerged between the late Middle English and early Modern English period, is concerned with the epenthesis of schwa between any of the vowels and diphthongs /i:, e:, o:, u:, ai, au/ and /r/ as shown below:

Pre- /r/ breaking: $\emptyset > /ə/$ if /i: e: o: u: ai au/ $__ /r/$

Table 3: examples of pre-/r/ breaking (McMahon 1994:74)⁷

/bi:r/	> /bi:ə r/	<i>beer</i>
/tʃe:r/	> /tʃe:ə r/	<i>chair</i>
/mo:r/	> /mo:ə r/	<i>more</i>
/ʃu:r/	> /ʃu:ə r/	<i>sure</i>
/fair/	> /faɪə r/	<i>fire</i>
/taur/	> /tau ə r/	<i>tower</i>

With reference to Wells (1982:214) pre-/r/ breaking can be interpreted as an example of a “natural phonetic” phenomenon. Even though Wells does not elaborate on what he actually understands by a “natural process”, it can be assumed that pre-/r/ breaking emerged due to an articulatory effort that has to be made when the tongue moves past a tense, non-low vowel such as /i: e: o: u:/ to the post-alveolar or retroflexed position of /r/. In the following, an epenthetic offglide occurs as the tongue passes via the /ə/ area towards the alveolar/post-alveolar region. Table 3 also demonstrates that the two diphthongs /aɪ/ and /aʊ/ were equally affected by the process of pre-/r/ breaking.

Consistent with what has been said so far, Heselwood (2006:80) claims that this epenthetic schwa does not have a phonological origin but surfaces due to biomechanical reasons. Moreover, the schwa of pre-/r/ breaking serves the purpose of a hiatus-breaker and introduces a lowering process of high vowels (Dobson 1968:740).

In order to explain why pre-/r/ breaking occurred, it may be proposed that the emergence of glides serves the purpose of minimizing the contrast between the preceding vowel and /r/. According to this it can be inferred that epenthetic schwa serves as a means to assimilate the preceding long close or half-close vowel to the succeeding /r/-sound. This in turn leads to a less contrastive perception of the whole sequence.

⁷ Although McMahon does not mention any examples for pre-/r/ breaking after short vowels in her own studies, it can be assumed that the processes also applied in context of short vowels.

It has been suggested by a number of writers (McMahon 2000:234; Wells 1982: 216) that pre-/r/ breaking was followed by pre-schwa laxing, which shortened historically long vowels before the newly inserted non-syllabic schwa sound. Essentially, pre-schwa laxing can be formulated as: /i: e: o: u:/ > /ɪ ɛ ɒ ʊ/ if __/ə/

Table 4: examples of pre-schwa laxing (McMahon 1994:74)

/bi:ər/	> /bɪər/	<i>beer</i>
/tʃe:ər/	> /tʃɛər/	<i>chair</i> (>/tʃɛ:/) ⁸
/mo:ər/	> /mɒə r/	<i>more</i> (>/mɔ:/)
/ʃu:ər/	> /ʃʊər/	<i>sure</i> (> /ʃɔ:/)

As noted by Laurer, (2005:41) the process of pre-schwa vowel shortening produced new allophones in non-rhotic varieties as the diphthongs /ɪə ɛə ɒə ʊə/ only occurred before coda /r/. The consequence was that the long close or half close vowel phonemes /i: e: o: u:/ could no longer occur in that particular context as they were substituted by centring diphthongs. Given this, it can be suggested that it became predictable which allophones of a phoneme would manifest in any particular environment since they were in complementary distribution then. However, these conditioned variations could not be maintained thanks to two new developments. Firstly, /ɪə/ can be traced back to an additional origin thus meaning that the centring diphthong also derived from “syllabicity loss of schwa after long vowels” (ibid). To illustrate the incident of “/ə/-syllable” omission Wells (quoted in Laurer 2005:41) uses the word *idea*. He points out that the word must have been trisyllabic once (/aɪdi:ə/) but became bisyllabic by the time the long /i:/-sound was shortened due to pre-schwa laxing and eventually resulted in the /ɪə/ glide. Secondly, the loss of final /r/, which constitutes the final stage in the transition from rhoticity to non-rhoticity, also led to the phonemization of centring diphthongs. As a result, the system of English vowels was extended considerably.

⁸ It must be noted that some of the centring diphthongs have been subject to change again and have further developed into monophthongs.

It has even been suggested that coda /r/ had such a massive impact on the quality of its preceding vowels that it caused “the most far-reaching change of the system of long vowels after the great vowel shift” (Lutz 1994:167).

In fact coda /r/ brought about a change which transformed long close or half-close vowels into centring diphthongs (as demonstrated above). This means that the quality and quantity of short vowels was also altered as they developed into either of the three long monophthongs /ɑ:/ ɜ:/ ɔ:/ in the context of final or pre-consonantal /r/. As regards the origin of present day English /ɜ:/ it has been argued that the sound solely resulted from the merger of Middle English /ɛ/, /i/ or /ʊ/ with coda /r/. To illustrate this, the following examples should be given: /ɛ/, the stressed vowel phoneme of Middle English virtue (spelled as vertue back then), earth or heard underwent centralization and as a result the /ɜ:/ sound arose. The same process applies to Middle English shirt and birth since the short, close-mid vowel /i/ had also been centralized before final or pre-consonantal /r/ and eventually developed into /ɜ:/. Moreover words such as journey and spur were equally affected by the process of centralisation. Thus, Middle English /u/ + /r/ evolved into /ɜ:/ as well (Gimson 2001:126). By way of contrast, /ɑ:/ and /ɔ:/ of non-rhotic varieties also derived from other sound changes (Lutz 1994:167).

To finish off the description of the gradual sound change which lead to a new distribution of the /r/ sound in non-rhotic varieties, the process of complete omission of /r/ before consonants or in final position needs to be discussed. It is indeed feasible to regard the loss of /r/ as a “qualitative catastrophe” in the history of English as it led to considerable changes in the set of English vowels (Lass 1997:283). It is due to pre-/r/ breaking, pre schwa laxing as well as the resulting processes of vowel lengthening and vowel merger that the inventory of vowels before historical /r/ was radically modified and became restricted to only a few vowels. In this case RP serves as a prime example as its vowel inventory became extremely reduced in the more recent past. Accordingly, McMahon claims that in the environment of historical /r/ speakers of RP only make use of the following vowels nowadays:

Table 5: Restricted inventory of vowels before /r/ in “Estuary English”:

(McMahon 2000:237)

[ɔ:]		oar, floor, for, lore, shore, etc.
[ɑ:]		star, bazaar, far, etc.
[ɪə]		bear, fear, near, here, etc.
[ɛə]	>[ɛ:]	care, there, air, etc.
[ʊə]	>[ɔ:]	assure, pure, cure, gourd, etc.
[ɔə]	>[ɔ:]	more, lore, four, force, etc.
[ɜ:]		stir, fir, fur, word, err, heard, etc.
[aɪə]	>[ɑ:]	choir, fire, etc.
[aʊə]	>[ɑ:]	flower, tower, etc.
[ə]		letter, better, father, sugar, figure, etc.

In some non-standard varieties of British English such as Cockney and “Estuary English” a further reduction of the vowel inventory can be observed. Thus, it is possible that only six vowels surface in the context of historic-/r/ in non-onset positions in some of the spoken varieties of South-Eastern British English. Besides long low [ɔ:] and [ɑ:]; the centring diphthong [ɪə]; long tense [ɛ:] which is optionally smoothed form [ɛə]; long central [ɜ:] and its short counterpart [ə] have established themselves as inherent elements of the RP inventory of vowels before historical /r/. Additional neutralisation of [ʊə], [ɔə], [aɪə], [aʊə] which is a particularly frequent among speakers of Estuary English⁹ contributes to a further decrease of vowel phonemes in the set of vowels (McMahon 2000:237). Thus, the disappearance of /r/ undoubtedly had a massive impact on English phonology as it led to a large-scale reorganisation of the vowel system.

Jenner (1996:117 quoted in Laurer 2005:49) reports an overload of diphthongal phonemes in the vocalic phoneme inventory and therefore pleads for a more

⁹ Rosewarne (quoted in Laurer 2005:76) defines Estuary English in the following way: “EE is a variety of modified regional speech. It is a mixture of non-regional and local English pronunciation and intonation. If one imagines a continuum with RP and London speech at either end, EE speakers are to be found in the middle.”

economic description of the phoneme system by disregarding centering diphthongs/glides (/ɪə/, /eə/, /ʊə/, /ʊə/). He further maintains that these schwa-glides may be regarded as a contextual or realizational allophone of /r/. Therefore he advocates:

a simpler and more powerful descriptive apparatus which would reduce the number of apparent phonological differences between the major varieties of English, by treating some surface diphthongs as allophonic variants of an underlying vowel + [-r].

Now that we have formulated these three sound changes separately we may not find much interdependence between these processes. Evidence for an absolute chronology of the three attached processes is inconsistent. Yet, it might be claimed that /r/ deletion can only have happened after pre-/r/ breaking. Moreover it is highly likely that the shortening of vowels could only have been introduced after the insertion of schwa between a vowel and /r/ (McMahon 1994: 75).

Once again it seems that a mere description does not really provide any explanation of why each of these changes should have occurred at all. It is not yet clear why these changes proceeded in a particular successive order, how long it actually took to finish off the process or why these changes only had an impact on some particular dialects. Above all, it needs to be questioned whether we are indeed dealing with a completed change that can be explained by means of a covering law or whether it is rather a change in progress.

In addition to that the question remains whether the change should be labelled as a consonantal or vocalic phenomenon. In other words was it the /r/ that conditioned the changes or its preceding vowels? Examined from the point of view of the /r/, it may be inferred that its preceding environment conditioned the change. The gradual phonological change represents an instance of “progressive weakening” of the consonant which ultimately lead to the deletion of coda /r/. Conversely it is also possible to view the sound change as a vocalic development since it is the vowel system that was affected by the “gradual vocalisation of /r/” (Lutz 1994:168). It is therefore no surprise that in the handbooks of Luick (1964) and Pinsker (1959) coda /r/ related sound changes are tackled in connection with changes affecting the inventory of stressed vowels. Hence they are to be found in

the vowel section of their books and are usually referred to as “r-Wirkungen” (cf. Luick 1964:726; Pinsker 1959: 54 et sqq.).

3.2 Dating the change: an interpretation of orthoepic records¹⁰

When reading up on the dating of the sound change(s) under consideration, one notices fairly quickly that we are dealing with an area which is subject to considerable disagreement and variability. Although a variety of evidence for early /r/-loss is at hand it appears almost impossible to determine exactly when the phenomenon started to occur. While Lutz (1994: 167) suggests that /r/ vocalization is an early Modern English sound change, this assertion is generally rejected by other scholars such as Wells (1982: 218) and Lass¹¹ (1997:282) who regard the emergence of non-rhoticity as a late seventeenth and early eighteenth century development. Yet, all these diverse and conflicting interpretations appear to be entirely justified since one has to recall that the diffusion of a linguistic innovation, just like any other innovation, usually represents a gradual and discontinuous process, affecting certain groups of people in certain geographical areas earlier than others (Chambers & Trudgill 2002:166).

Since textual material documenting first incidences of vocalisation of postvocalic /r/ is extremely ambiguous, it appears somewhat problematic to determine when precisely the sound change took place. Notwithstanding this, one might be interested in finding out what orthoepists and phoneticians of previous centuries suggest concerning the use of coda /r/ in those days. Ideally, these texts contain traces of information on phonological changes affecting the /r/ and its immediate environment which hopefully sheds light on the temporal dimension of the interim stages as well as the relative chronology of the changes described in chapter 3.1. By examining Middle and Early Modern English texts of various kinds, Lass (1997:285) came across first documentations of sporadic pre-consonantal /r/-loss in individual lexical entities. Given this, we may be able to verify McMahon’s hypothesis (1994:77) that the loss of /r/ “seems to have begun pre-consonantly,

¹⁰ The following subsection, if not indicated otherwise, is based on information taken from McMahon (2000: 234- 240)

¹¹ Lass maintains that ‘the standard of when a change occurs may be facile and misleading’ (1997:287). Besides, he claims that a lot of changes were completed (or even took place at all) much later than is usually thought. He himself dated some changes as much as half a millennium later than other scholars have (1997:289)

and spread to word-final position”. Among his findings, which Lass regards as indices of a “trial run” or “precursor” stage of the actual change, are words such as:

Table 6: First incidents of sporadic pre-consonantal /r/ loss between C13th and C18th:

- bass < OE /bærs/, ME /bars/ (13th C)
- ass < OE /ærs/, Scots ers, G arsch (13th C)
- Worcester [wʊstə] < Wigora-ceaster (Wosseter 1552)
- passel < parcel (Lady Sussex 1642)
- passons < persons (Lady Sussex 1642)
- hoss < horse (15th C Sir Degrevant - rhymed with foss)
- cuss < curse (17th C. US vernacular)
- bust < burst (17thC US vernacular)
- monyng < morning (Cely papers 15th C)
- Dasset < Dorset (Cely papers 15th C)
- cadenall < cardinal (16th C)
- hash < harsh (Jones 1701)
- mash < marsh (Jones 1701).

(Examples taken from Lass 1997:285)

As for this early stage of /r/ deletion, it should be clarified that we are only dealing with word-specific, isolated and therefore relatively rare innovations. It is quite striking that the consonant following historical /r/ is the voiceless alveolar fricative /s/ in the majority of cases.

Only as late as the 17th century, the first written sources of the loss of final /r/ can be found and only in unstressed syllables. Writers seem to have been particularly confused with the spelling conventions of loanwords such as opera and Bavaria which were spelled as <operer> and <Bavarior> (Lass 1997:285). It may be claimed that the r-ful spelling of these words is indicative of hypercorrection. Obviously people had already been aware of the new pronunciation variant in which coda /r/ was deleted. Yet, for some significant reason (presumably on account of social prestige), people tried to avoid using the new variant. This in turn occasionally may have caused the production of coda /r/ by mistaken analogy out of a desire to be correct. Therefore it can be deduced that even though the muteness of /r/ in coda positions of unstressed syllables had already been established by that time, speakers tried to “mind their r’s” and sometimes even inserted /r/ sounds in words where they were etymologically not present. Other

cases of inverse spellings of that time can be found in the Spanish word *salva* or the Dutch word *genever* which were borrowed as <salver> and <geneva> (ibid).

First clues for pre-/r/ breaking are revealed by the 16th century phonetician John Heart (1569 referred to in McMahon 2000:235). By transcribing the word *fire* as /feiër/, *mire* as /meier/, *oar* as /o'ër/, *pure* as /piuër/, *dear* as /diër/ or *here* as /hier/, Heart clearly indicates the insertion of a novel sound which presumably had the quality of a schwa before coda /r/ (Luick 1964:611). Likewise, Jespersen (1909:318 quoted in McMahon 2000:235) provides examples of orthographic evidence denoting schwa-epenthesis in the 16th century. Accordingly, the Old English spelling <scūr> was substituted by <shower> moreover <tower> became the standard spelling convention for the French loanword <tour>.

Another supplier of evidence for pre-/r/ breaking is Abraham Tucker (1773 quoted in McMahon 2000:235). He claims that a special sound which he labels as 'v' is "commonly inserted between the long vowels "ē, ī, ō, ū" and /r/. Thus the words "there, beer, fire, more, poor, pure, our" are pronounced as "theur, biur, foivr, mour, puur, vuur". It seems to be beyond doubt that Tucker was trying to describe the schwa-sound since he compared it to the sound which is produced in hesitations "as when the watchman calls 'past ten v-v-v clock', or when a man hesitates till he hits upon some hard name, as 'This account was sent by Mr v-v-v Schlotzickoff, a Russian'(ibid).

First accounts on pre -/r/ lengthening are given by Christopher Cooper in his grammar *The English teacher* of 1687 (quoted in Lass 1997: 286). He observes quantity adjustment before /r/ and a number of voiceless fricatives. Moreover Cooper further notes that the /r/ is "framed by the tip of the Tongue moved toward the middle of the Palate, while the breath is passing out on all sides, causes a tremulous motion". His observation on the production of the sound implies that a differentiation between the different /r/-allophones has not been made.

Further descriptions for the lengthening of low vowels in the context /r/ are given in Marther Flint's "Prononciation de la langue Angloise" (Kökeritz 1944 also quoted in McMahon 2000:236 and Lass 1997:286), an early handbook on Modern

English pronunciation written in 1740. Flint does not only notice that the /r/ underwent considerable weakening but also stresses that the low back /ɑ/ and /ɔ/ became long vowels in the context of /rC/- clusters as in *barb*, *guard*, *arm*, *yarn*. He points out that “l’r devant une consonne est fort adouci, presque mute & rend un peu longue la voyelle qui le précède”. Moreover he found out that the same processes apply if the letter <o> is followed by consonant clusters such as *rd*, *rk*, *rm* or *rn*. On the lengthening of /ɔ/ Flint commented as follows: “Davant *rd*, *rk*, *rm* & *rn* il aproche beaucoup de l’a overt François, parce que l’r qui est prononcé foiblement, le rend un peu long, mais bref du mois que dans les mot ci-dessus”(Flint quoted in Kökeritz 1944: 20).

By the end of the 18th century Walker (referred to in McMahon 2000:236) observes that although the long /ɑ:/ sound hardly ever surfaces in the English language it does so in monosyllabic words that contain a final <r>. He is also one of the first to note that in case <a> and <o> occur before <rrV> or <rV>-clusters as in *carry*, *marry*, *orator*, etc., these vowels are much shorter than in contexts where <r> appears word-finally or where it is followed by a consonant.

Besides the lengthening of short low vowels, Mather Flint’s account on early eighteenth-century English pronunciation also provides evidence for the centralization of /ɪr/, /ʊr/ and /ɛr/ to /ɜ:/. By comparing pairs of words such as *herd*-*sherd*-*beard*-*heard*; *perch* –*search*; *verge* – *dirge*; *pear*-*girl*; *chern*- *dern*- *earn*-*learn*; *herse*- *disperse*-*rehearse*- *fierce*- *pierce*; *earth*-*birth*-*mirth*; *fir*-*fur* (Kökeritz 1944:70-72) he discovers that these words vary in spelling but are pronounced in the same way. Examples of earlier /ɜ:/ centralization are outlined in Otto Jespersen studies (1909:319-320). He claims that the new variant /ɜ:r/ for words that were previously articulated as /ʊr/ and /ɪr/ had already established itself in Shakespearean times as he found incidences where Shakespeare himself rhymed *first* and *accurst* or *stir* and *incur*. Moreover Jespersen uses early 18th century sources which explicitly stated the complete coalescence of all three sounds /ɪr/, /ʊr/ and /ɛr/ to /ɜ:r/ for the first time. Likewise the development of the letter <i> is documented as follows:

The letter r seems to have the same influence on this vowel, as it evidently had on a and o. The i, coming before either double r, or single r, followed by a vowel, preserves its pure, short sound, as in irritate, conspiracy, &c. but when the r is followed by another consonant or is in a final letter of a word with the accent upon it, the i goes into a deeper and broader sound. So fir, a tree, is perfectly similar to the first syllable of ferment, though often corruptly pronounced like fur, a skin. Sir and stir are exactly pronounced as if written sur and stur” (Walker 1791 referred to in McMahon 2000:237).

Lastly, orthoepical evidence for the eventual elimination of /r/ can be found from the mid 17th century onward. The actual vocalisation seems to have started in syllables holding an additional consonant in their coda and progressed to syllable final positions.

According to Harris (1994:231) it is John Walker’s *Critical Pronunciation Dictionary and Exposition of the English Language*, published in 1791, that presents the first evidence of actual /r/-dropping. In his chapter on English pronunciation he distinguishes between two different types of /r/-sounds:

There is a distinction in the sound of this letter, never noticed by any of our writers on the subject, which is, in my opinion, of no small importance; and that is, the rough and the smooth r. The rough r is formed by jarring the tip of the tongue against the roof of the mouth near the fore teeth: the smooth r is a vibration of the lower part of the tongue, near the root, against the inward region of the palate, near the entrance of the throat. (Walker 1791:50 quoted in Harris 1994:230)

As the rough form might cause “harshness to the ear” Walker suggests to use this variant only in phonological settings illustrated by words such as *Rome* and *rage* and the smooth variant in contexts illustrated by words such as *bar* and *bard*. With a disapproving attitude Walker also comments on the pronunciation of /r/ in both Irish and London accent. Besides labelling the Irish accent as “harsh”, he also claims that the rough variant is inaccurately used in all phonological contexts. “But if the letter is too forcibly pronounced in Ireland, it is often too feebly sounded in England, particularly in London, where it is sometimes entirely sunk” (Walker quoted in Harris 1994:231). According to this observation the linguistically progressive melting-pot London may again as be regarded as the cradle of language change¹².

¹² see /h/-dropping, use of glottal stops, /l/-vocalisation, ect.

However, a number of earlier sources already pinpoint what was to become one of the key pronunciation variables among world Englishes. On the one hand there is the 1740 account of Mather Flint, who still transcribes final /r/ but italicises it, indicating that it is only variably pronounced. On the other hand there is Tucker (1773:35 quoted in McMahon 2000: 239) who besides providing sound evidence for pre-/r/ breaking (see above), also comments on the supposed preference for the newly emerged “v” sound. He claims that the “v” is the preferred option due to its ease of articulation, an attribute that cannot be ascribed to /r/, on which he comments in the following way: “Upon rendering the end of the tongue limber, so that it will shake like a rag with the bellows, it will rattle out *r*, but this requiring a strong stream of breath to perform, makes it the most laborious letter of all, and consequently as much out of our good grace as I said *v* was in them”. He further states that “you shall find people drop the *r* in *fuz*, *patial*, *savant*, *wost*, *backwad* and many other words, and whenever retained we speak it so gently that you scarce hear a single reverberation of the tongue” (ibid).

Ben Jonson gives a fairly similar description in his English grammar of 1640: “/r/ is sounded firme in the beginning of the words, and more liquid in the middle, and ends” (Jonson quoted in Lass 1997:287). In Lass’s view the “firme” variant represents a trill whereas the “liquid” variant most likely corresponds to an approximant or weak tap.

By claiming that “R [...] has always the same sound, and is never silent” the elocutionist Sheridan (1781:34 quoted in McMahon 2000:240) apparently makes an endeavour to retain the sound’s “rough” quality. However, this statement can not be regarded as counter-evidence for /r/-loss. Instead, it should rather be interpreted as a typical prescriptivist reaction to change. According to Lass (1997:286) “remarks of this kind are kind of suggestive; one does not have to say that something never happens unless it commonly does”. The purist grammarian vehemently tried to promote an ideal, standardized form of spoken English and therefore denies the ongoing changes. His contemporary Walker, on the other hand, who also published grammars in an attempted to clear the English language from the “vices of vulgar” (Rödiger-Schluga 2004:8) recommends his readers to produce initial /r/ as forcibly as they wish but final and preconsonantal /r/ must be

“nearly as soft as in London”(1791:50 quoted in McMahon 2000:240). Due to Walker’s acknowledgement of /r/-lenition it can be concluded that the phenomenon was socially accepted by the end of the 18th century (ibid). However there is good reason to believe that /r/- vocalization only possessed covert prestige up to the beginning of the 19th century. Apparently, it was somehow stigmatised due to its Cockney origins (Smith 1996:37). The famous romanticist John Keats, who is also referred to as a member of the “Cockney school”, was often criticized because of his habit of rhyming such pairs as *crosses* and *horses*; *fawns* and *thorns*; *thoughts* and *sorts*, which indicates that his accent was non-rhotic. In those days this stylistic technique was regarded as inappropriate in serious linguistic discourse (Bailey 1996:102).

Resistance continued mainly among those whose language was shaped outside London. Thomas Write Hill (1763-1851) a schoolmaster from Birmingham denied the change in an attempt to regulate the English language. His objection against the innovative /r/-less pronunciation of London is evident in the following passage:

Indeed, the *r* of our language, when correctly formed, is among the most pleasant of articulate sounds, and ought more carefully to be preserved for posterity than can be hoped, if the provincialists of the Metropolis and their tasteless imitators be to be tolerated in such rhymes as *fawn* and *morn*, *straw* and *for*, *grass* and *farce* ect., to the end of the reader’s patience. (Hill 1821:102 quoted in Bailey 1996:102)

Lastly, in the late 19th century, there is official evidence for non-rhoticity to be the standard variant. In his *Early English pronunciation* (1874 quoted in Lass 1997:187) A.J. Ellis¹³ refers to the /r/ in *four* as one of the “indistinguishable sounds” and observes that presence and absence of post-vocalic /r/ alternates. However “there is a liberty, seldom exercised unless a vowel follows to add the trilled /r/”. In other words postvocalic rhoticity is no longer mandatory. More than two centuries after the onset of coda weakening in the context of /r/ traces of rhoticity can still be detected. By and large however, the process of /r/-deletion is completed¹⁴. By the end of the 19th century rhoticity even started to be regarded

¹³ Ellis was born in 1814 and is regarded as one of the greatest 19th century phoneticians besides Henry Sweet.

¹⁴ There are studies indicating that /r/-vocalization is still in progress in some areas. Romaine (1978:144) documents loss of postvocalic /r/ in syllable final position among working class Edinburgh schoolchildren, especially among male informants. Moreover, Sullivan (quoted McMahon 2000:232)) reports a sharp decline in rhoticity for young urban speakers in Exeter.

as “deviant” as some travelers’ tales give descriptions of an awkward “burr” that still prevails in the northeast of England (Bailey 1996:103).

To conclude, /r/-loss must be seen as a very gradual process as it stretches across at least four centuries. As mentioned above, early , sporadic loss appears as early as the 13th century, yet the change is not completed until the 1790s where there is “a rule” specifying the occurrence of /r/ in non-rhotic varieties. Roger Lass summarized the disappearance of /r/ in the following way:

Table 7: “Real time story” of /r/-loss (Lass 1997:287)

Precursor: Sporadic loss¹⁵, no lengthening *c.* 1300-1715

Variable lengthening from *c.* 1680

Weakening of /r/: *c.* 1640 onwards

Sporadic loss + stable lengthening: 1740-90

Loss: after 1790, but still unstable or with traces *c.* 1874

Although we can give some credence to Lass’s summary of the process of /r/-deletion it still needs to be born in mind that we are not really dealing with a complete loss of /r/. Since loss of /r/ is context-sensitive it still happens to surfaces in certain phonotactic positions. Hence we need to go into further detail and discuss in which contexts /r/ is still licensed to appear today.

3.3 /R/ liaison¹⁶ - Linking and Intrusive /r/

So far, we have been looking at the diachronic development of /r/, or more precisely the transition from a purely rhotic phonology to the present-day English division into rhotic and non-rhotic dialects. A survey of what we know on how this division emerged was given. It is, however, understood that the processes affecting coda /r/ have not come to a standstill and further innovations have spread since the loss of coda /r/.

¹⁵ Examples for sporadic loss of non-final /r/ are: ass <OE ears; bass < OE baers; hoss <horse; cuss < curse, ect.

¹⁶Besides /r/-liaison , “/r/-sandhi” is another generic term for the phenomena of intrusive /r/ and linking /r/ (cf. Hay & Sudbury 2005; Heselwood 2006)

If we scrutinise the present-day English situation, we may not only observe /r/ deletion in certain contexts but also linking /r/ as well as the phenomenon of unetymological intrusive /r/. However, it needs to be pointed out that synchronically speaking we do not in fact notice /r/-deletion but only assume its disappearance due to spelling obsolete spelling conventions as well as the existence of rhotic varieties within English.

Today, the majority of non-rhotic dialects show linking and intrusive /r/¹⁷.

Linking /r/ refers to cases in which /r/ is orthographically present. It only surfaces if a word or syllable final post-vocalic /r/ is succeeded by a word or syllable beginning with a vowel. Thus, in phonotactic¹⁸ terms this implies that /r/ can only occur in syllable onsets but not in codas (Giegerich 1992: 281-82). Examples of an alternation of /r/ and Ø are given below:

Table 8: Word internal linking /r/ (Harris 1994:234)

<i>stir</i> /stɜː/	but	<i>stirring</i> /stɜːrɪŋ/
<i>clever</i> /klevə/	but	<i>cleverer</i> /klevərə/
<i>hear</i> /hɪə/	but	<i>hearing</i> /hɪərɪŋ/

The table shows that /r/ is pronounced if an inflectional or derivational ending beginning with a vowel is added to a word ending in <r>. Hay and Sudbury (2005:2) refer to this as “word internal linking /r/”.

Similarly, “an /r/ is regularly added if the word ending in /r/ is followed in the same rhythmic group by a word beginning with a vowel” (Johansson 1985:53). Giegerich (1992: 282) terms this phenomenon “linking /r/ in connected speech” which can be exemplified in the following way:

¹⁷ Yet there are non-rhotic accents (mainly in the Southern states of the US) that neither exhibit linking nor intrusive /r/ (Harris 1994:232)

¹⁸ This area of linguistic thought shall be exploited in more detail in the chapters to come

Table 9: inking /r/ in connected speech (Johansson 1985:53)

<i>after</i> /ɑ:ftə/	but	<i>after all</i> /ɑ:ftə:l/
<i>far</i> /fɑ:/	but	<i>far away</i> /fɑ:rə'weɪ/
<i>her</i> /hə:/	but	<i>her aunt</i> /hə:r'ɑ:nt/
<i>before</i> /bi'fɔ:/	but	<i>before eight</i> /bi'fɔ:r'eɪt/

The vowels which may be followed by linking /r/ are usually the low vowels /ɑ:/ and /ɔ:/ and those single and complex vowels containing final schwa (/ə/, /ɜ/, /ɪə/, /eə/, /ʊə/) (Johansson 1985:54; McMahon 1994:84).

Although language purists wish to restrict the use of linking /r/ to cases with etymological /r/, we can also observe a great number of instances of linking /r/ where there is no /r/ in the spelling. Intrusive /r/ preferably occurs in the context of preceding schwa; nevertheless numerous examples of intrusive /r/ are also to be found with preceding /ɑ:/ and /ɔ:/ sounds, albeit to a lesser degree of certainty (Gimson 2001:288). Examples of intrusive /r/ are given in the following table.

Table 10: “Intrusive /r/” (McMahon 1994:84)

<i>saw</i> [Ø]	but	<i>saw[r]ing</i>
<i>withdraw</i> [Ø]	but	<i>withdraw[r]al</i>
<i>law</i> [Ø]	but	<i>law[r] and order</i>
<i>idea</i> [Ø]	but	<i>idea[r] is</i>
<i>drama</i> [Ø]	but	<i>drama[r] and music</i>

The table shows that /r/-epenthesis occurs both word-internally and in connected speech just the as in the case of linking /r/.

In this way we may suggests a phonological rule of intrusive /r/:

/r/ insertion: Ø > r if /ə, ɑ:, ɔ:/ __ V (McMahon 1994: 84)

McMahon (1994:84) postulates that intrusive /r/ derived because speakers of non-rhotic varieties learned to use /r/ only in initial and intervocalic positions. As a consequence, they also began to insert /r/ in historically non-rhotic intervocalic positions even if the following vowel occurred after a morpheme or word boundary. This led to an alternation in words with final /r/, so that the /r/ was either inserted (intrusive /r/) or recycled (linking /r/) when the following sound was a vowel (Hay & Sudbury 2005:3). What happened was that the original rule which deleted /r/ in one context was reinterpreted as a rule which inserts it in the inverse context. Vennemann was the first to identify this aspect and terms it “rule inversion” (Vennemann 1972:216).

Instead of these alternations being produced by an /r/-dropping rule operating on underlying forms containing /r/, a new generation of speakers came to infer underlying forms without /r/, a phonetic /r/ [...] being introduced in the appropriate intervocalic environment by a rule of Rule Insertion (Wells 1982:222)

Apparently, it becomes impossible for speakers to distinguish between lexical items that no longer have an underlying /r/ (such as *fear*) and those which historically never had an etymological /r/ (such as *idea*) (Wells 1982:223). Thus, it is claimed that linking and intrusive /r/ arose through a similar process and are distinct only historically and orthographically (Hay & Sudbury 2005:3). An alternative explanation of why /r/-liaison emerged shall be presented in chapter 4.

3.3.1 Distribution of /r/-liaison across dialects

In Present Day English, the occurrence of /r/ liaison has been reported in most non-rhotic dialects of English. Field studies have been conducted on South East London English (Tollfree 1999), RP English (Bauer 1984), Boston English (Irwin & Nagy 2007) and New Zealand English (Hay & Sudbury 2005), which confirm that their speakers exhibit both etymological and unetymological /r/. However, Gimson (2001:288) reports that there is a minority of RP speakers that do not produce /r/-sandhi. He claims this is mainly due to fact that “spelling consciousness remains an inhibition factor” which keeps them from producing it. Furthermore, Harris (1994:232) gives an account of a non-rhotic variety spoken in the upper southern parts of the United States that neither exhibits linking nor

intrusive /r/¹⁹. Last but not least, Wells (1982:225) reports of other Southern US speakers that do have linking /r/ but lack intrusive /r/.

As demonstrated in 3.2.1 non-rhotic dialects are inconsistent with respect to the incidences of /r/-sandhi. Therefore it appears to be of interest to which degree this fluctuation is dependent on social factors. Most results of studies on /r/-liaison in a stratified sample of speakers show that both linking and intrusive /r/ is socially constrained. A case study by Hay and Warren (2002 quoted in Hay & Sudbury 2005:6) investigated the occurrences of intrusive /r/ in contemporary New Zealand English. On the social level they found out that participants of higher socio-economic backgrounds were less likely to have intrusive /r/s in their speech, which may be put down to the fact that such speakers are more aware of or concerned about the “correct” form. Moreover Brown (1988 referred to in Hay&Sudbury 2005:5) postulates that a stylistic variation exists:

There is also clear stylistic variation in the phenomenon; use of linking/intrusive /r/ is a feature of fluent colloquial style, and is not so common in careful declarative style.

As for intrusive /r/ after /ɑ:/ and /ɔ:/, it is comparably rare because it is still stigmatized in these contexts. On the other hand, intrusive /r/ is more likely if it is preceded by a schwa as it already possesses some overt prestige (Gimson 2001:289). Accordingly, it may be postulated that the social acceptance of intrusive /r/ will spread to other phonetic environments as well which clearly promotes language change. Gimson (2001:289) also suggests the following “gradation in the likelihood of occurrence” of /r/-liaison:

The insertion of /r/ is obligatory before a suffix beginning with a vowel, where the /r/ is historically present. (thus *stirring* /stɜːrɪŋ/)

The insertion of /r/ is optional, though generally present, before a following word beginning with a vowel, where the /r/ is historically justified. (thus *my dear Anna* /maɪ dɪər ‘ænə/)

¹⁹ Hay and Sudbury (2005:4) assume that South African English exhibits the same features

After /ə/, even an intrusive /r/ (i.e. historically unjustified) is generally used before a following word, e.g. *vanilla essence* /vənɪlɹ 'esəns/, *vodka and tonic* /vɒdkəɹ ən tɒnɪk/

After /ɑ:/ and /ɔ:/, an intrusive /r/ is often avoided before a vowel, e.g. *nougat and chocolate* /nuɡɑ:r ən'tʃɒklɪt/.

The insertion of intrusive /r/ before a suffix is often strongly stigmatized, e.g. *strawy* /'strɔɹɪ/

3.4 Summary and further questions

Although we have now described *how* the changes spread, we have not considered in any depth *why* they were implemented and subsequently spread. With respect to hand book accounts and orthoepical evidence, it can be stated that they only provide us with valuable information for analysing the *how*-question. Also, the social factors which we have taken into account so far are the events that actuated a specific change but did not necessarily cause it in any deeper sense. Consider the following analogy:

In remote areas the closing-down of an ore-mine is said to have triggered a massive migration to urban regions. But in fact the close-down alone does not cause the exodus. The underlying causes are a combination of factors, such as insufficient supply of labour, low income, poor or extreme living conditions, lack of education opportunities, etc. When one of these factors reaches a certain point any of them could trigger mass migration²⁰.

If we want to determine the underlying causes which may have led to the disappearance of post vocalic /r/ and the emergence of /r/-sandhi, respectively, we need a theoretical model to account for the observable linguistic behaviour. Among the various linguistic schools, language change has been ascribed to a variety of factors, including social, physical and mental parameters. Aitchison (1991:124) is certainly correct when she says that “the causes of language change

²⁰ Martinet (1955:36 quoted in Aitchison 1991:101) gives the skier-avalanche analogy.

are double-layered”. On the one hand there are the external social factors that ultimately trigger the change but on the other, there are also underlying “linguistic and psychological factors which reside in the structure of the language and the mind of the speaker”.

Although I am of the opinion that sociolinguistic studies provide us with extremely valuable and illuminating results on how the changes were actuated and got implemented, they do not have any “deeper” explanatory power. Arguably, there must however be a deeper cause for a change because I believe that after all sociolinguistic factors cannot cause arbitrary changes. To put it in other words, there must be an underlying reason for a particular language change to proceed in a particular direction. Thus, the next question I would like to consider is why the /r/ sound developed in a certain direction – why did it get lost in the first place and why was it implemented (again), especially in the case of intrusive /r/?

With regard to the emergence of /r/-loss and /r/-liaison a few informative accounts exist which are beyond a descriptive analysis and deal with the whole phenomenon on a more explanatory level. For my own investigation I found studies²¹ by Donegan (1993), Harris (1994), Hay & Sudbury (2005), Lutz (1994) and McMahon (2000). While Hay & Sudbury looked at the phenomenon from an entirely socio-linguistic perspective, McMahon and Lutz adopted a phonotactic framework. Harris approaches English /r/ in a government phonology framework and Donegan looks at the phenomenon from a natural phonological perspective. Although their analyses are all very informative, only some of them consider a broader, more integrative approach which applies to both r-disappearance and r-liaison. In my own analysis I will therefore primarily be dealing with the theoretical framework of natural phonology and particularly focus on the field of phonotactics. Both are holistic approaches and explain language change on an abstract level. They are applicable to omission and insertion processes alike.

²¹ Apart from Lutz who tries to integrate r-deletion and insertion process all of the above mentioned accounts are exclusively dealing with r-sandhi phenomena.

4 Natural Phonology

In the following chapter the explanatory model of Natural Phonology will be introduced. It shall be demonstrated how this theory approaches language change in general and phonological change in particular. Based on what we already know about the disappearance and liaison of syllable coda /r/, the theory shall be put to the test. Under the assumption, that we are dealing with phonetically conditioned processes (i.e. natural phonological processes), it shall be analysed in which way they affected the /r/ sound. Then we will hopefully be able to explain how and why the sound developed the way it did.

4.1 The framework of Natural Phonology

Generally speaking, Natural Phonology (NP henceforth) is a theory of “phonological structure, acquisition and change” first proposed by David Stampe in 1973 (Dziubalska-Kolaczyk 2007:71). As opposed to general descriptive theories, NP represents a preference theory. Hence, generalized statements formulated in NP must not be regarded as absolute rules or general laws but as universal or language-specific preferences (Dziubalska-Kolaczyk 2002:73).

Language users (i.e. speakers and listeners) employ language as a tool for communication. Both interlocutors pursue certain goals when communicating. Accordingly, it is the function of language to allow both speakers and listeners to achieve their communicative goals (ibid). Dziubalska-Kolaczyk (2007:72) maintains that “particular linguistic choices” must be seen “as results of goal-oriented linguistic behaviour of language users”.

These linguistic choices emerge due to a tension between two contradictory preferences. It has been postulated that a conflict occurs between the desire for an ease of production on the one hand and the wish for clarity of perception on the other. In other words, a goal conflict arises due to the need for a language to be easily pronounceable for the speaker and the demand for a language to be easily perceivable for the listener.

A basic concept of NP is that of “natural phonological processes” (Stampe 1973 cited in Donegan 1978:3). Phonological processes²² represent natural and automatic reactions of the human mind to the obstacles faced in the production and perception of speech (Dziubalska-Kolaczyk 2007:71). Cluster simplification, epenthesis, elision, stopping, nasalization, devoicing, voicing, etc. are examples of natural phonological processes.

[A natural phonological processes is] a mental operation that applies in speech to substitute, for a class of sounds or sound sequences presenting a specific common difficulty to the speech capacity of the individual, an alternative class identical but lacking the difficult property. (Stampe 1973:1 quoted in Donegan 1978:3)

Although the “responses” are implemented by the human vocal and perceptual system these phonological processes are actuated in the mind. An important prerequisite for understanding the processes governing language change is that comprehending and producing speech involves cognitive processes. Although sounds and utterances are physical by nature, they must be produced and comprehended in the mind. As a consequence, natural phonological processes must be regarded as systematic substitutions in the brain which result in phonetic changes (Donegan 1993:102).

NP therefore sheds light on the motivation of phonetic change. Phonological processes are neither random slips of the tongue, nor do they spread arbitrarily in the course of time. They are implemented because the mind discovers phonetically difficult elements in language and subsequently gives the instructions to replace them with phonetically easier ones. It is important to realize that phonological processes are not learned through observation, comparison and imitation of forms but are motivated by bodily requests. In other words, phonological processes are phonetically motivated. (Donegan 1993:102, Dziubalska-Kolaczyk 2002:71).

Although substitutions are mental in occurrence, their purpose or teleology is clearly physical: to maximize the perceptual characteristics of speech and minimize its articulatory difficulties. They are mental operations performed on behalf of the physical system involved in speech perception and production. (Stampe 1973:9 quoted in Hubmayer 1986:51)

²² In the field of language therapy the term “phonological process” is used to refer to predictable pronunciation “errors” made by children when they acquire language and learn to talk like adults.

Furthermore cross-linguistic studies on language change reveal that phonological processes must be universal as language user's reactions towards phonetic difficulties are generally the same. Yet, "universality of processes does not mean that they apply in all languages – only that they are motivated in all speakers" (Donegan 2002:64 quoted in Dziubalska-Kolaczyk 2007:71). Only in the course of language acquisition, a child (language user) starts to impede certain natural processes and attains the language-specific phonology of its parents. In other words, the child (or rather its mind) learns to monitor articulation and perception as well as to inhibit the natural substitutions.²³

After all, one of the core assumptions of NP is that natural phonological processes are generally motivated by physical factors and not by observing and analysing the linguistic behaviour of adults (Donegan 1993:102). Basically and essentially, they are innate rather than learned processes. What distinguishes one linguistic community from another "is the set of learned inhibitions of these processes". The processes themselves are universal (ibid). According to David Stampe, a phonetic change arises due to the child's failure to curb the innate process that does not operate in the standard language and thereby alters the old phonological system.

In structuralist and generative theory no differentiation between "phonetically motivated" and "conventional" or learned substitutions was made. The question of how and why innovative language users initiate certain processes was never really addressed. How and why were they implemented in the first place? In a few structuralist and generative accounts it was claimed that phonological changes usually originated in the speech of an innovator. Subsequently, rules were established by other speakers within the language community who then copied the influential speaker.

²³ Stampe's and Donegan's claim that the sound patterns in child speech reflect universal phonological processes, which may later be inhibited in the course of language development has been vehemently refused by other scholars (such as Dressler (1996) and Belvis (2004) working in the field of NP. For them sound patterns of child speech are merely the patterns of an immature state of articulation. According to Dressler there is no evidence whatsoever for claiming that phonological processes are innate. To regard these them as 'natural phonological' patterns is only based on speculation.

Donegan's crucial point of criticism on theories assuming that phonological processes are learned by other users who make up "rules", is that they do not explain what the underlying motivation for the phonetic innovation is and how these "rules" are learned (1993:104-105). According to NP there is no such thing as an innovator whose phonetic system is imitated by other speakers who then invent rules for the new phonetic realisation. Sound change is not interpreted as a process of rule insertion but as a process of "restructuring" or "rule modification" (Hubmayer 1986:50).

4.2 Explanation in NP

As mentioned above, statements proposed in NP must be taken as preferences rather than absolute laws. As for the explanatory model of NP, preferences are based on non-linguistic higher-order principles such as the "principle of least effort". These principles not only apply to language but also to other non-linguistic phenomena and disciplines (e.g. cognitive, psychological, sociological, etc.). They follow a more holistic approach in an attempt to explain the "the nature of things" in general. As regards preferences on the linguistic level it can be stated that a simpler phonotactic structure is the more preferred structure – for instance a CV-structure is generally more preferred than a complex consonant-cluster structure. Hence, the language-specific consequence of this preference is an absence of clusters in that language (Dziubalska-Kolaczyk 2007:73). A graphical representation of the explanatory model of Natural linguistics is given:

Figure 2: The explanatory principle of natural linguistics

(Dziubalska-Kolaczyk 2007:73)

higher principles (e.g., the <i>principle of the least effort</i> , of <i>cognitive economy</i>)	<i>non-linguistic</i> (<i>cognitive, phonetic, psychological, sociological etc</i>)
⇓ ⇓ ⇓	⇓ ⇓ ⇓
preferences (e.g., a preference for simple phonotactics, for a CV structure)	<i>linguistic</i>
preference parameters (pronounceability, perceptibility)	<i>functional and semiotic</i>
⇓ ⇓ ⇓	⇓ ⇓ ⇓
consequences of preferences (absence of clusters in a language)	<i>linguistic</i>

Thus, universal principles explaining the general causalities are exploited to determine preferences of phonotactic structure on the linguistic level.

If two conflicting preferences cross, the more “natural” preference which is “cognitively simple, easily accessible (especially to children), elementary and therefore universally preferred, i.e. derivable from human nature, or is unmarked/less marked” will be the more preferred one (Dressler 1999 quoted in Dziubalska-Kolaczyk 2007:73).

The concept of “preference” corresponds to the notion of “naturalness” and “unmarkedness” respectively. Generally speaking, the preferred element is considered to be the more natural or unmarked element whereas a less preferred element is considered to be the unnatural or marked element (Dziubalska-Kolaczyk 2002:77).

4.3 The higher-order principle of least effort

This ‘short /ʊ/²⁴ is easiest pronounced of all vowels [...] and therefore is a great favourite with my country men, who tho not lazy are very averse to trouble, wishing to do as much work with as little pains as possible’
(Abraham Tucker 1773 quoted in McMahon 2000:235).

²⁴ The symbol /ʊ/ was introduced by Tucker to denote *schwa* (see also chapter 3.2 p.21)

It appears that Tucker's intention behind this statement was to praise the efficiency and effectiveness of the newly emerged schwa sound in the context of postvocalic /r/. Because the sound involves a minimum of articulatory effort, and therefore is effective without jeopardizing intelligibility, it is the naturally preferred option. In other words, the sound is more preferred because it simplifies those structures that not only used to be effortful for the speaker but also redundant for the listener.

It is generally agreed that from a biomechanical standpoint the articulation of /r/ in its manifold realisations is relatively effortful, no matter if we are talking about a flap, tap, roll, etc. Besides, there is a universal preference for a less effortful and less complex articulation. The loss of post-vocalic /r/ corresponds to that trend and can therefore clearly be attributed to the principle of least effort (Laurer 2005:50). Let us now briefly turn to the principle of least effort and discuss its features and application.

4.3.1 The concept of “least effort”

At first glance, the notion of “least effort” seems straightforward and self-explanatory. The core-assumption is that the all effort should be kept to a minimum. In principle, it can be postulated that all human actions and decisions are determined by the general objective to reduce effort. Moreover, it has been maintained that the principle is “underlying” and “governs our conduct” (Zipf 1949 [1972]: V).

George Kingsley Zipf was the first to define and conceptualize the principle of least effort in his outstanding philological work on *Human Behavior and the principle of least effort* first published in 1949. In Zipf's view “each individual will adopt a course of action that will involve the expenditure of the probably least average of his work (by definition, least effort)” (Zipf 1949 [1972]:543).

This concise definition also has its shortcomings and might lead to a misconception of the principle as it is very tempting to equate least effortful and simplest action. However, this assumption is not imperative. Looked at in the short term, it does make sense to dedicate a lot of time, power and effort to

something because it will refine the status quo and above all it will save future effort. In other word, what seems to require a lot of effort in the short run, will in fact lead to a reduction of effort expenditure in the long run. Generally speaking it may be postulated that systems strive to minimize the respective workload in order to achieve the objective of convenience or least effort.

To illustrate the principle, Zipf uses the allegory of two towns, which he labels with the random names A and B. These two towns are set apart by a vast mountain range. For people who wish to get to the other town, the mountains must be crossed. Due to harsh weather conditions, crossing the mountains may be extremely effortful even if the shortest way is taken. To solve this problem it will be of interest for the inhabitants on both sides of the mountain to build a tunnel. Even if the construction presents an enormous short-term monetary investment and demands a lot of energy, all endeavour will be worth it in the long run. Zipf is certainly right when he says that the general workload is reduced substantially and that “our selection of path will be determined by the particular dynamic minimum in operation” (Zipf 1949 [1972]:2).

4.3.2 Application of the principle

It has already been emphasized that the principle operates on all levels of human behaviour. It applies both for the individual and society as a collective. A human behaviour that we are particularly concerned with is “language”. For Zipf language-internal “problems” are also solved by the principle of least effort. He notes that the principle of least effort must be considered as the “[...] primary principle that governs our entire individual and collective behaviour of all sorts, including the behaviour of language and preconception” (Zipf 1949[1972]:VIII).

By applying the theory to all domains of human activity and not limiting it to activities in nature and the natural sciences, Zipf promotes the universality of the principle, thus turning it into a higher order principle that provides the fundamental basis of any system or thought. On the level of phonology, it can be stated that Zipf’s account of least effort represents a feasible framework for approaching various phonological phenomena and the way language is constituted in general.

According to Zipf, the principle of least effort does not apply until the average amount of work expenditure has been calculated. Only then the “path of least average work” can be chosen (Zipf 1949[1972]:6). Thus, two complementary steps have to be taken in order to ensure that only a minimum of effort is expended. The common procedure to minimize the average rate of work has the following course: First, the piece of work to be done as well as the probable work expenditure has to be assessed and estimated respectively. Second, the most economical way needs to be chosen.

As regards the principle’s application on language or linguistic change, Zipf stresses the importance of short-term effort expenditure. He argues for investing a substantial amount of workload in order to avoid perceptual confusion and claims that this initial effort expenditure will be of worthwhile in the long run.

Zipf also proposes a tools-and-jobs analogy: he compares words to “tools” and communication to “jobs”. In a language, words are the tools to achieve a successful communication. Conversely, the “job” or primary objective of language is to communicate meaning. Moreover, he distinguishes between two conflicting linguistic economies: the economy of the speaker and the economy of the listener. Both interlocutors pursue different economic objectives when communicating. The intention of the speaker is to convey meaning with a minimum of tools (words). He favours merger and articulatory ease. By way of contrast, the listener’s interest is to determine one meaning with a maximum of tools (words). He favours contrast and clarity and is interested in maximal reproducibility. Neither of them is willing to allocate more energy than absolutely necessary. The speaker’s wish for “unification” stands in direct opposition to the listeners demand for diversification. For the shaping of language a compromise between the two conflicting interests needs to be found and both parties must adjust to the constant trade-off that takes place. The trade-off proves that in communication effort is still invested in order to avoid perceptual confusion and to guarantee meaning (Zipf 1949[1972]:22). Hence, the principle of least effort must not be regarded as an underlying force that aims at maximizing the acoustic contrast and minimizing the articulatory effort because eventually the ultimate

goal is to keep perceptual confusion to a minimum as well as to reduce the production effort by creating less motor effort.

When investigating the motivation of linguistic evolution, the notion of effort is usually incorporated. The main focus is on the interaction between minimization of mental and articulatory effort and maximization of acoustic contrast and on which of the two contrasting forces will be the dominant one.

4.4 Defining naturalness

The concept of linguistic naturalness has its origins in structuralism and came to prominence by the publication of Stampe's theory of Natural Phonology which was established in an attempt to determine phonologically natural features of a language. David Stampe derives his idea of 'naturalness' from the structuralist concept of "markedness". Both terms denote that elements in a phonological system are of unequal status (Rice 2007:79). Thus, an element "x" can be characterized as either more or less natural than "y". In linguistic discourse, "natural" has often been used as a synonym for "cognitively simple" or "universally preferred" (Dressler 2003:461). It is assumed that unnatural features demand a great deal of effort from the human language capacity and are therefore less preferred. Equally, some phonological elements are more natural than others because they present less difficulty to the language user. Thus, the more natural a linguistic element, the more favourable it is for the language user and the more frequently it will be found in a language. For naturalness on the production level Stampe maintains the following:

Sounds and sound-sequences are not all equally easy to articulate. The more demanding ones are relatively rare in languages of the world and are usually acquired late in childhood (Stampe 1973:10).

Given this, it can be deduced that natural constructions are preferred by the speaker for the simple reason that they are easier to produce and therefore much more advantageous for the language user. While natural features are genetically motivated and constitute inherent elements in the user's phonology, marked features become established due to language-specific rules (McMahon 1996:97).

In the course of time, the term's application has expanded in many ways so that a universally valid definition of "natural" seems somewhat problematic (ibid). It is therefore hardly surprising that the relevant literature offers a terminological diversity for the dichotomy between natural and unnatural structures. Rice (2007:80) groups the expressions into two categories. The terms listed in the first group are taken from outside the field of phonology (a) while the second group represents phonology-specific terms denoting markedness and naturalness respectively (b).

Table 11: Markedness terms (Rice 2007:80):

	marked	unmarked
(a)	less natural more complex more specific less common unexpected not basic less stable appear in few grammars later in acquisition early loss in language deficit implies unmarked features harder to articulate perceptually more salient smaller phonetic space	more natural simpler more general more common expected basic stable appear in more grammars earlier in acquisition later loss in language deficit implied by marked features easier in articulation perceptually less salient larger phonetic space
(b)	subject to neutralization unlikely to be epenthetic trigger of assimilation remains in coalescence retained in deletion	result of neutralization likely to be epenthetic target to assimilation lost in coalescence lost in deletion

Rice (2007:80) takes these characterizations of marked/unmarked dichotomy from various sources ranging from early 20th Century standard text books of Trubetzkoy (1939) and Jakobson (1941) to current linguistic writings of Crystal (2003) and de Lacy (2006) among others.

It is indeed sensible to group markedness characteristics into universal markedness characteristics (a) and structural or phonological markedness characteristics (b) that constrain sound systems and determine sound change (ibid).

4.5 Evidence for naturalness

A key-assumption of NP is that natural forms are preferred. Now, how can we assess which forms may be regarded as natural and which as marked? There are a number of linguistic sources providing evidence for natural linguistic preferences. In this respect, McMahon (1996:98) offers a checklist for determining naturalness.

Language acquisition: natural features tend to be acquired earlier in childhood.

Perception: natural features tend to be better understood than marked ones.

Speech errors: slips of the tongue typically occur with unnatural features which are then substituted by more natural ones.

Aphasia: natural features are relatively unlikely to be get lost in aphasia.

Language change: natural features are relatively averse to change but are often the product of phonetically motivated change.

Frequency of occurrence: natural features occur frequently and in various different contexts in languages they are part of the inventory of.

Borrowing and neologism: natural features tend to prevail over unnatural ones in loanwords and word coinage.

Cross-linguistics: natural patterns are relatively frequent cross-linguistically.

Given these assumptions, it has been postulated that marked features tend to become less and less marked. Thus, a phonological change that follows this universal trend constitutes a natural phonological change. As there is also evidence for change towards a more marked structure the explanatory power of naturalness is only limited. Once again, it must be emphasised that it is not mandatory for a universally preferred process to apply in all contexts and languages, only that they are universally motivated (Donegan 2002:64 cited in Dziubalsk-Kolaczyk 2007:71)

4.6 Segmental versus sequential naturalness

Apart from the perpetual tension between the speaker's desire for ease of articulation and the listener's wish for ease of perception, there is yet another recurring conflict, namely that between context-free, sequential and context-sensitive, segmental naturalness.

On the segmental level, articulatory or perceptually less complex units can be regarded as natural (Hubmayer 1986:180). Oral vowels, for instance, are segmentally more natural than nasalized vowel as they lack the additional feature [+ nasal]. However, if we incorporate the context of the segment and examine the whole sequence, marked features can become naturally preferred ones. This can be illustrated by a sequence in which a vowel is followed by a nasal consonant. It can be observed that both segments tend to assimilate and become more like another. Assimilation must be regarded as a sequentially natural process because floating transitions demand less articulatory effort and are therefore preferred. Thus, depending on the context, a segmentally marked element may be subject to unmarking on a higher level. The process can be summed up by the term "markedness inversion" (Hubmayer 1986:183). What we observe is a naturalness conflict between the segmental and the sequential level. Although an element may be regarded unnatural on the segmental level, it may be natural on the sequential level and vice versa. Generally speaking, those elements that are natural on the higher, sequential level are prior to segmentally natural elements. Thus, a sequentially natural or preferred construction generally overrides a segmentally natural or preferred one (Hubmayer 1986: 183; Dziubalsk-Kolaczyk 2007:74).

Dziubalska-Kolaczyk (2002: 169) also notes a scale of precedence of higher-order units over lower order units. She maintains that morphological rules take priority over phonological processes²⁵ and proposes the following generalisation for all linguistic levels:

²⁵ NP distinguishes between rules and processes. While rules are learned structures associated with morphology, processes are inherent phonological structures. (Dziubalska-Kolaczyk 2002: 169). Today, interactions between phonology and morphology are studied in morphonology.

There is a scale of precedence of higher-order grammatical units over lower-order grammatical units, while a semiotic principle of figure and ground determines the saliency relations within the same class of units as well as within the units themselves (Dziubalska-Kolaczyk 2002: 169).

Apart from the principle of least effort, the semiotic principle of figure and ground is another higher, non-linguistic principle postulating that the contrast between a single consonant and a vowel represents a better figure-against-ground structure than a consonant cluster constellation (Dziubalsk-Kolaczyk 2007:74).

4.7 Fortition and Lenition processes

Substitutions are natural phonological processes which are either targeted at adjusting the phonological intention of the speaker to his or her phonetic capacity, or facilitating the act of decoding messages for the listener. They are either context-sensitive, assimilatory lenition processes (also known as weakening or backgrounding processes) or context-free, dissimilatory fortition processes (also known as strengthening or foregrounding processes) (Dziubalsk-Kolaczyk 2007:71). Fortition processes strive to limit the set of possible pronounceable and perceivable segments by making sounds more and more dissimilar. Moreover they are designed to make pronunciations more perceptible which in turn results in the maximization of differences with neighbouring segments. For this reason fortition can be classified as a listener-friendly process.

Conversely, lenition which includes processes such as assimilation, monophthongization, reduction and deletion optimizes the pronunciation of sequences of segments. Owing to lenition processes, difficulties in connection with sequential combination of features will be eliminated. They are weakening processes because they decrease phonetic quality of segments, noticeably reducing the contrast between an element and its environment. Lenition can therefore be regarded as a speaker-friendly process (Donegan 1993:109).

Backgrounding processes preferably operate in weak sequences, such as the coda of a syllable or unstressed positions. It can be claimed that weak segments are less important for the conveying of meaning than strong segments. For some cases it might even be claimed that their presence is redundant. Therefore, the speaker's reaction to omit or weaken these segments is perfectly justifiable (Rödiger-

Schluga 2004:30). Informal discourse and hypoarticulate speech can be characterized as a speaker-friendly speech situation in which the speech tempo will be relatively high while the level of articulatory accuracy will be rather low (Donegan 1978:22). In casual, careless speech only little attention is paid to the listener's goals in communication. This can, for example be put down to the fact that the speaker thinks that the context of the conversation is so obvious that intelligibility will be provided anyway. On top of that, the speaker may lack respect for the listener (Rödiger-Schluga 2004:31). Overall, lenition processes preferably apply in situations where articulatory effort is generally low or when the message is highly predictable out of the context and where it is acceptable to employ a "low perceptual quality" of speech (Donegan 1978:22).

Conversely, foregrounding processes preferably occur in listener-friendly speech situations and refine the perceptibility of a segment or word. Moreover these processes are most likely to affect the strong positions in an utterance, i.e. stressed positions and syllable onsets (ibid). Mother-child-interactions or the communication with speakers lacking command of the target- language are discourses that frequently exhibit foregrounding processes (Dziubalska-Kolaczyk 2002: 107). The intention behind these kinds of speech situations is to keep misunderstandings to a minimum. As opposed to speaker-friendly discourse, speakers consciously monitor the way they produce their messages in order to guarantee an optimal perception. The segments in an utterance are very contrastive which in turn facilitates perception for the listener. It is beyond doubt that elements of a strong syllable are more important for the perception of a message than weak ones. The loss of a phoneme in a strong position undoubtedly has repercussions on the syllable structure and might even result in incomprehensibility of the message. Backgrounding processes in strong positions are therefore relatively rare and unnatural (Rödiger-Schluga 2004:31).

4.8 Natural syllable structures

Syllables are structurally constrained. Therefore, not every segmental constellation is permitted in a language. Universal and language-specific preferences for syllable patterns can be established for the various parts of the syllable: onsets, nuclei or codas. Under certain contextual circumstances syllables

may be subject to change. Segments may be inserted (a process known as epenthesis), reordered (metathesis) or lost (elision). Syllable structure preferences are based on the hypothesis that modification processes contribute to the simplification of syllable structures (Hubmayer 1986:243). Vennemann (1988:2) even goes as far as to say that “every syllable structure change is an improvement of syllable structure”²⁶ – a hypothesis he is trying to corroborate by means of his preference laws.

It has been postulated that the “optimal” or “natural” syllable structure takes the form of a consonant-vowel-alternation. A CVCV...-sequence is universally preferred because it is in accordance with both perception- and production-driven requirements. The preference for CV-clusters can primarily be ascribed to phonetic conditions. First of all, CV-Clusters are articulatory preferred because they show a simpler articulatory dynamic and secondly, they are also perceptually preferred because the alternation of consonants and vowels exhibits the strongest contrasts (Hubmayer 1986:184). Evidence for the universal preference of CV-syllables comes, for instance, from studies on language acquisition and aphasia (Dziubalska-Kolaczyk 2002: 95).

Although CC-clusters have a relatively low frequency of occurrence cross-linguistically, complex clusters are still part of the phonology of numerous languages of the world. According to Dziubalska-Kolaczyk (2002: 113), it is the function of a consonant-cluster “to counteract the CV-only preference and [...] to counteract the creation of dysfunctional clusters”. By means of her beats-and-binding model, Dziubalska-Kolaczyk tries to determine the “goodness” of a cluster and claims that good²⁷ clusters will be less likely to be subject to alternation and language change.

The term “beat” refers to “a regularly recurring skeletal prosodic unit of phonological representation, of a size corresponding to that of a segment” (Dziubalska-Kolaczyk 2002: 86). Beats occur in alternation with “non-beats”. Unlike

²⁶ At the same time he admits that there are also changes worsening the syllable structure. These changes are then not motivated by the syllable but only affect it.

²⁷ Vennemann (1988:1), in his approach towards naturalness of syllable structures, refuses to refer to a linguistic structure as “good” or “bad” (“natural” or “unnatural”, marked or “unmarked”). Instead he maintains that syllable constructions can only be “better” or “worse”.

non-beats, beats have the attribute of being relatively salient or prominent segments (*ibid*). Dziubalska-Kolaczyk's model suggests three universal preferences with respect to the beats and non-beats. First, there is a preference for a trochee, i.e. a stronger unit (beat) is followed by a weaker unit (non-beat). Second, a beat is most likely represented by a vowel. Third, an alternation between beats and non-beats is favoured (Dziubalska-Kolaczyk 2002: 93). Overall, perceptually and articulatory contrasting structures are preferred.

Another important concept of the beats-and-binding model is related to the way beats and non-beats are attached to each other (Dziubalska-Kolaczyk 2002: 94). While a beat can stand on its own, a non-beat must be bound to a beat by either preceding or following it. These binary bindings are perceptually motivated and subject to the principle of contrast. According to the theory, sound sequences can only be composed of two forms of binary bindings: either a non- beat is followed by a beat ($n \rightarrow B$) or a beat is followed by a non-beat ($B \leftarrow n$).

Generally speaking, the combination $n \rightarrow B$ is inherently stronger than $B \leftarrow n$. Acoustic phonetic observations show that consonant-vowel transitions can be much better perceived than vowel-consonant transitions. Another reason for a CV-preference lies in the generally more precise articulation, thus implying a better perception (*ibid*). It needs to be stressed, however, that despite the generally preference of a CV-syllable, this development also has its limitations. The process of syllable reduction will not proceed until a language reaches the stage of CV-only structure because a language also serves a communicative function and therefore the optimization towards a CV-only syllable is only partly realised (Hubmayer 1986:187).

In the beats and binding model, the “goodness” of a consonant-cluster is evaluated by measuring the perceptual distance between the members of a sound sequence (e.g. C_1C_2V)²⁸. If the auditory distance of the elements in the consonant-cluster is

²⁸ Dziubalska-Kolaczyk (2007: 73-74) utilized the ‘net auditory distance principle’ (NAD Principle) in order to measure the perceptual distance between elements in a sound sequence. With respect to initial consonant clusters she suggests that a preferred structure takes the form of CCV, with a net auditory distance between the double consonant being greater or equal to the net auditory distance between the vowel and the consonant neighbouring on the vowel: $NAD(C_1, C_2) \geq NAD(C_2, V)$.

greater or equal to the auditory distance between the following vowel and the consonant neighbouring on it, the cluster is preferred and will not be subject to weakening (Dziubalska-Kolaczyk 2007: 73-74).

As the beats-and binding model is primarily concerned with determining the most natural or preferred consonant clusters of initial positions (i.e. onsets), this is not satisfying enough for our purpose, which is to explain the process affecting coda-/r/. However, the general assumption that an $n \rightarrow B$ constellation is generally preferred shall be taken into consideration. A thorough account of the changes affecting syllable-coda structures is given by Vennemann (1988:25ff.) and Lutz (1991:149ff.). They study syllables patterns in an attempt to determine which syllable structures are universally preferred and thereby also indicate the direction of syllable structure changes (Vennemann 1988:1).

4.8.1 Coda weakness – a universal syllable structure preference

Aitchison (1991:126) points out that articulatory weakness of coda sounds must be regarded as a universally valid development which has been observed in many languages world-wide. She maintains that “all consonants are weak at the end of a word if no vowel follows. They are weakly articulated, and difficult to perceive”. The preference for a weak coda broadly corresponds to Dziubalska-Kolaczyk’s concept of “ $n \rightarrow B$ ” preferences.

In his book “*Preference laws for syllable structure and the explanation of syllable change*” Theo Vennemann (1988:21) pursues the question of how the preferred syllable structure manifests in the various language systems. For the coda he suggests the following preference law:

A syllable coda is the more preferred: (a) the smaller the number of speech sounds in the coda, (b) the less the consonantal strength of the offset and (c) the more sharply the consonantal strength drops from the offset toward the consonantal strength of the preceding syllable nucleus.

In the first part of the law Vennemann argues for a short coda. According to his observations, languages strive to reduce effort by keeping codas of words short and simple. In order to do so, there is a general tendency to delete coda segments. The second part of the law refers to the tendency towards a progressive weakening of the final speech sound of a given sequence by exhibiting less and less

consonantal strength. The third part of the law describes the preference for a sharp disparity between nucleus and coda in terms of consonantal strength. A nucleus-coda sequence is the more preferred, the sharper the increase of consonantal strength towards the coda (Vennemann 1988:27).

Evidence for the universality of coda weakness comes from cross-linguistic studies in the field of phonotactics, observations in first language acquisition, phonetic analysis and historical linguistic studies.

Languages that only allow open syllables and therefore show a general lack of codas are prime example for the universal preference of a weak coda²⁹. Lutz (1991:149) points out that consonant clusters are not permitted in a wide variety of languages. She also reports that the distribution of consonants in the coda of many languages is relatively restricted compared to the total inventory of consonants in those languages. Moreover, preferences for a weak coda can also be determined for languages in which complex consonant clusters are licensed. Germanic languages, for instance fall in this category. These languages exhibit consonant constructions that are feasible in onsets but not in codas and vice versa. Apart from that, it may be inferred that those phonemes that are permitted in both the coda and the onset very often differ substantially with regard to allophonic realisation. While initial allophones of a phoneme can be described as more consonantal, their medial and final counterparts show a weak, more vocalic quality (Lutz 1991:150). The same preference also manifests in ontogenetic studies. It can be demonstrated that children, when they start articulating first words, almost exclusively produce open syllable, independent of the language they acquire (ibid).

As regards phonetic observations, lenition processes tend to occur more frequently in informal, fast speech. Lenition processes either result in total reduction or weakening of the coda. In this respect, it can be observed that weakening very often involves a gradual decrease of consonantal strength of a coda segment through a sequence of weakening changes, as shown in figure 3 below (Lutz 1991:151).

²⁹ Bell and Hooper (1978:9 quoted in Lutz 1991:149) note that 10-25% of all languages world-wide only allow open syllables word-finally.

Consonantal strength

←

vl stops vd stops
 vl fricatives

vd fricatives nasals laterals r-sound w j closed vowels open vowels

Last but not least, numerous sound change phenomena are in agreement with the universal preference for a weak coda. The universal tendency towards coda weakening can for instance be illustrated by the numerous consonantal losses in the history of English which are closely connected to the emergence of lengthening of preceding vowels (Lutz 1991:151).

Lenition processes had far-reaching effects on the English language, especially its phonotactics and led, among other things to the total loss of a number of coda consonants. This implies that the affected sounds reached the “final stage” of total vocalisation and explains why they are restricted to the onset position of accented syllables today³⁰.

³⁰ It needs to be stressed here that this study is exclusively dealing with processes affecting coda consonants of accented syllables.

can be observed for the semi-vowels /j/ and /w/, for the glottal fricative /h/ and the liquids /r/ and /l/³¹ (albeit only in certain dialects/sociolects) (Lutz 1991:153). All of these five consonants are inherently weak which can be demonstrated and backed up by the above mentioned scale of consonantal strength. On the one hand, these consonants must be classified as inherently weak on grounds of their phonetic characteristics. According to Lutz (1991:153) both semi-vowels and liquid sounds have the quality of being voiced, open and oral consonants. When producing these sounds the airstream escapes through a relatively narrow tract in the mouth without causing friction. These are features semi-vowels and liquids have in common with vowels rather than consonants. Moreover, with respect to acoustic resonance it can be stated that they also exhibit a vowel-like formant structure, with /j/ and /w/ being the most vowel-like, /r/ being less vowel-like and /l/ being the least vowel-like (ibid). On the other hand, all of the five sounds can be regarded as weak due to their positional strength. In other words, their presence or absence also depends on phonotactic conditions.

However, with respect to phonetic and acoustic features, /h/ is distinguished from the other sounds and therefore deserves special attention. /h/ is considered as a weak consonant although its features “fortis”, “voiceless”, “fricative” are essentially consonantal. The main reason for this being that the produced friction noise is not very distinctive at all. This also explains why /h/ does not have a lenis counterpart (Lutz 1994:171).

Moreover, despite the fact that all five consonants are inherently weak, their phonotactic distribution is markedly different. This can be ascribed to the fact that not only /h/ on the one hand but also liquids as well as semi-vowel on the other show an inhomogeneous phonetic basis. While the weak sound /h/ was subject to deletion very early intervocalically and in onsets of unaccented syllables³² as well

³¹ /l/-vocalisation is described as a more recent phenomenon and remains geographically and socially restricted (cf. Laurer 2005).

³² Occurrences of /h/-dropping have a very long history. The /h/ was not only affected in initial position but also in word-medial positions particularly in the Old English period (examples: OE *rāha* for ‘dear’). In Old English /h/ also occurred in final position (examples: *þēh*, *þēah* or *þurh* for ‘although’ or ‘though’). Loss of initial /h/ before the consonants /n/, /r/ and /l/ started to progress from Middle English onwards (examples *hnutu* for ‘nut’) or *hring* for ‘ring’) (Lutz 1991 quoted in Rödiger-Schluga 2004:6).

as in the syllable coda of accented syllables in Early Modern English, all other inherently weak consonants exclusively got lost in codas (Lutz 1991:153).

Lutz (1994:171) notes that in previous stages of English the weak consonants /j/, /w/, /h/, /r/ and /l/ all occurred both in head and coda settings. However, in the course of time one consonant after the other was gradually weakened and subsequently became limited to syllable onsets. Interestingly, this progressive and systematic process corresponds to the degree of inherent consonantal strength of the consonant. A phonotactic restriction to the onsets position was first noticeable with the palatal approximant /j/ in the Old and very Early Middle English period. The development was then followed by the velar approximant /w/ in Old English and Early Middle English. During the Middle English and Early Modern English period the glottal fricative /h/ followed the trend and so did /r/ in Early Modern English. In some British English dialects, coda weakening has developed even further and also affected the lateral approximant /l/, which represents the stronger of the two liquids according to the scale of consonantal strength.

What we find are distributional parallels and a similar historical development in all of these sounds. Given this, it may be concluded that the changes under consideration are in fact only successive stages of one single, coherent, phonetically and phonotactically motivated consonantal development (Lutz 1994:171).

4.9 Analysis of /r/-loss and /r/-epenthesis – a natural diachronic account

In the following, it shall be discussed to what extent the /r/-sound was subject to natural phonological processes. Based on what we know about the characteristics of naturalness it shall be determined if the phonological distribution of /r/ is indeed phonetically motivated and thus natural. The central question will be whether the processes of elision, that is, the loss of /r/ under certain circumstances and /r/-epenthesis, that is, linking and intrusive /r/ can both be explained in terms of naturalness.

4.9.1 Loss of coda /r/ as a backgrounding process

Quite evidently, the deletion of post-vocalic /r/ represents a phonologically natural lenition process since it is context-sensitive and only affects /r/ sounds occurring in weak positions. Owing to lenition, new sequences were generated that were easier to articulate than the prior ones, thus conserving energy. By contributing to an ease of articulation, the process of /r/-deletion seems to be predominantly beneficial for the speaker. It has already been mentioned in chapter 4.7 that so-called speaker-friendly processes fall into the category of “natural backgrounding processes” (Dressler 1997:113).

/R/ lenition is in accordance with Vennemann’s preference laws for a weak coda (cf. Vennemann 1988 21-27). First of all, the preference law can be verified as the loss of coda /r/ constitutes a speech sound reduction. Second, the backgrounding process caused an imbalance in strength between onset and coda. While /r/ in coda-sequences can be described as a prime-lenition site, this is certainly not the case for /r/ occurring in onset positions where it remains fairly strong. Lastly, in contexts where /r/ is followed by another consonant, the disappearance of /r/ led to a sharp fall of consonantal strength from the coda towards the nucleus. In contrast to rhotic varieties where the consonantal strength is gradually decreasing from the coda towards the nucleus, non-rhoticity yields a more abrupt transition.

As specified in the coda proposal, /r/ fails to appear in the coda-environment of stressed syllables. The whole phenomenon of /r/-weakening may be summed up in the following way:

Das inhärent schwache /r/ Phonem des heutigen StE ist in seiner phonotaktischen Distribution gänzlich auf den Silbenkopf eingeschränkt. Die völlige Aufgabe von /r/ in der Coda akzentuierter Silben ist eine frühne. und ne. Entwicklung. Schwächung von Coda /r/ resultieren im Regelfall in einer fortschreitenden Vokalisierung [...] (Lutz 1991:160)

By defining /r/ as an inherently weak sound, Lutz exploits the phonological concept of consonantal strength. For a discussion of the concept and a graphical view of the scale of inherent consonantal strength see chapter 4.8.1 above. The scale clearly indicates that on account of its basic phonetic features we are dealing with a sound that is closer to the group of vowels than to strong consonants. Also

on the basis of its acoustic characteristics, the voiced post-alveolar approximant /r/ shows a vowel-like formant structure. As opposed to vowels, however, /r/ is only weakly perceived (Gimson 2001:207). I would therefore like to propose that the /r/ sound, just like any other sonorant, may not be considered as a full vowel nor as a genuine consonant but as a physically weak allophone that is fluctuating between the two sound categories. The sound is assigned to the appropriate category depending on its allophonic representation.

In short, /r/ is prone to deletion because of its vowel-like nature. At the same time it must be pointed out that coda /r/, just like any other consonant occurring in a weak position, is generally more likely to get weakened, irrespective of its inherent consonantal strength. This can be illustrated by the inherently strong voiceless stop consonant /t/ and the inherently weak consonant /r/ which are both relatively strong in accented onset positions, notably weaker in accented codas and weakest in unaccented coda positions (Lutz 1994:169). The only difference being that /t/ is predominantly reduced to a glottal stop in certain British English varieties while /r/ happens to be lost completely (Vennemann 1988:24). It is understood that both inherently strong and inherently weak segments are likely to be affected by lenition processes. Accordingly, Lutz (1994:169) proposes a positional strength gradation and juxtaposes inherent and positional strength in the following illustration:

Figure 12: Inherent and positional strength (Lutz 1994:169)

inherently	t	t	t
strong, e.g. /t/:			
inherently	r	r	r
weak, e.g. /r/:			
	head/ +accent	coda/+accent	coda/-accent
		head/-accent	
	positionally strong		positionally
			weak

On the basis of figure 12, it can be claimed that the specific quality of /r/ is primarily dependent on its inherent and positional strength. At the same time, it

must be questioned whether these two language-internal, physically and structurally determined parameters are the sole motivation factors for a phonological change. It seems that external influences such as register and speech tempo also constitute fundamental causes of lenition. Consequently, they must be taken into account as well (Lutz 1994:170).

Whether a lenition process occurs or not may have multiple causes. It seems that a backgrounding process is not only controlled by physical or mental aspects but also strongly depends on the social conditions communication takes place in. It may be proposed that the redistribution of /r/ was also influenced by extra-linguistic factors, that is, social factors outside the language system. Specifically speaking, /r/-loss appears to be constrained by factors such as speech tempo and register. It can be shown that lenition seems to be more likely in fast speech than in slow and deliberate speech. Moreover, lenition is also more likely to occur in casual speech situation where the interlocutors either know each other or the communicative context. In these speech situations it does not demand a lot of effort to detect the message even if the listener is unable to clearly perceive every single detail of the conversation.

In sociolinguistic studies it is assumed that language user's speech pace, register and style, social background and geographical provenance determine synchronic linguistic variation. So rather than viewing a language as a uniform and closed concept, language must be seen as a socially and geographically conditioned continuum where elements within that continuum vary according to social or geographical restrictions. If we scrutinize spoken language we will find various different realizations of a segment or a sequence of sounds within one and the same language, depending on the speech situation or the geographical background of its users. On the very far extremes of the continuum we find formal speech and casual speech, respectively. Casual speech has the characteristic of being fast pace and as a consequence natural phonological processes such as lenition, elision, assimilation and liaison are observed more often in these speech situations than in formal and careful speech (Hubmayer 1986:95-97).

As for loss of /r/, it can be stated that the context-sensitive backgrounding process is mainly motivated by physiological and articulatory causes. Moreover, it can be assumed that the reduced forms are produced unconsciously. A lack of attention leads to a reduction of effort which in turn sets off a general decrease in articulatory control. The less the articulatory control the more frequently lenition occurs especially in informal speech situations. However, it needs to be pointed out that listeners are generally able to detect structures without much difficulty due to their linguistic knowledge (phonological, morphological, lexical, syntactic and semantic knowledge). In Hubmayer's point of view (1986:98) it is the optimal form (formal variant) that is actually perceived by the hearer rather than the reduced form. Although lenition is primarily beneficial for the speaker, it is also unproblematic for the listener as the process seems to remain unnoticed or ignored.

Generally speaking, language users are rather flexible when it comes to changing circumstances in communication. Both speakers and listeners are able to cope with the linguistic characteristics of other individuals even though they can be quite marked at times and may differ significantly from their own.

It is the central objective of communication to understand and be understood. Therefore, we also have to adjust our linguistic behaviour to each other. This is where social conventions come into play. The way we speak seems to be dependant on the social status of the people involved in communication. In case the participants are in an unequal power-relationship, the person holding the lower social status will usually adjust to the speech style of the more powerful interlocutor. A relatively balanced relationship will also become manifest in communication as it will be characterized by a more casual language, which will often be less accurate pronunciation-wise. In any case, speaker and listener are dependent on each other when communicating. If the communicative act were not a joint venture and participants only protected their own interests, communication would be very limited and in the worst case even lack success. However, owing to social constraints successful communication between the two conflicting parties is guaranteed. When analysing a goal-conflict, it needs to be questioned whether a "win-win" situation can also be achieved in which language is similarly effective

and efficient for both parties. If we give credence to Hubmayer's postulation, lenition processes are not exclusively beneficial for the speaker but also tolerable for the recipient. According to his claim, the listener will perceive the optimal form instead of the weakened one, albeit to a certain extent. If listeners and speakers merely pursued their own interests, communication would fail. Again, it needs to be stressed that in any verbal interaction, certain social conventions have to be adhered to. At the same time a "total listener-speaker equilibrium" with regard to linguistic efficiency and effectiveness is hardly ever possible. Most of the time communication is either more beneficial for the speaker or the listener, depending on the communicative situation, the background and individual attributes of the people involved as well as their strengths and weaknesses in actual communication.

Synchronic analysis shows that although random phonetic variation is constantly occurring, it remains virtually unnoticed by the listener (Hubmayer 1986:99). However, as soon as a new variant starts to surface with a certain degree of frequency, it will be consciously perceived by the listener. This also marks the point where a new variant starts to spread to other individuals and the listener is likely to replicate the new variant in his or her own speaking. The new form is reproduced in alternation with the established one. Initially, the new form will only be used in a particular speech style (informal or formal) but will eventually spread to other contexts as well. It then depends on the linguistic community whether the mutation will be accepted or rejected. If the innovation is successful it will finally oust the old form and take over its part as the established form. New communicators (learners) will adhere to the new processes.

At times there may be an intense rivalry between established and innovative forms. It is therefore rather unsurprising that sound changes may take a long time to be put into effect, besides they are of course only partly implemented. While the diffusion of the change can only proceed very gradually on the lexical level as well as among the various dialects and sociolects, individual element (word, sequence, etc.) or speaker are usually abruptly affected. Naturally, this implies that linguistic diffusion must be seen as a rather complex, irregular process only

influencing some speakers at a given time while others remain unaffected (Hubmayer 1986:100).

Although socio-linguistic investigations provide sound arguments as to where the change took place, how it diffused or who the innovators of change are, the entire approach is limited to synchronic research. Moreover, the explanatory power of social factors is also limited because they do not tell us why certain sounds are subject to phonological process while others remain unaffected. Socio-linguistics only tell us that the social context triggers change but does not shed light on why a particular direction is chosen. It appears that this can only be explained by physical and mental factors who eventually determined the redistribution of coda /r/.

4.9.2 /R/-loss as a natural process

In the present study it is understood that r-lenition represents a reduction of articulatory complexity. It has already been pointed out that brain-actuated reduction processes must be interpreted as linguistic backgrounding processes. These processes are aimed at substituting complex or effortful structures by less complex ones. The processes are not only evident in the phonetics of a language they are also motivated by phonetic factors. In the natural phonological paradigm phonetically motivated changes are regarded as natural (Hubmayer 1986:188). Now we need to specify more closely why the disappearance of coda /r/ can be viewed as natural. In this respect Dressler (1977 quoted in Hubmayer 1986:189) maintains that natural processes have to comply with the following conditions:

First of all, a natural sound change does not take place in abrupt leaps but occurs phonetically and lexically gradual. In chapter 3 the gradual natural of /r/-loss has already been extensively described. Therefore it can be assumed that the change is in accordance with Dressler's first conditions for naturalness. Furthermore, it has been postulated that the phonotactics³³ of a sequence must be phonetically plausible. In those codas where /r/ surfaced non-finally, /r/-loss leads to a cluster simplification thus contributing to a simpler CV(C)-structure. This development corresponds to Dressler's second condition. Lastly, it is claimed that the direction

³³ What Hubmayer refers to as "phonetischer Kontext" is interpreted here as the 'phonotactics' of a sequence.

a change takes, must be phonetically motivated. Also this condition is fulfilled as less articulatory energy is required if coda /r/ is omitted thereby causing an ease of articulation. So, according to Dressler's basic conditions of naturalness it can be deduced that we are indeed dealing with a natural change towards a less marked structure. Phonetically speaking, loss of /r/ represents a reduction of articulatory effort and with regard to phonotactics the change leads to a reduction of the coda making it more consonantal and distinguished from the nucleus. Apart from Dressler's conditions, we need to evaluate the checklist of chapter 4.5 and see if it provides evidence for /r/-loss as a natural process.

In brief, it has been proposed that natural features are acquired early in childhood. Studies on language acquisition indicate that children have severe difficulties producing /r/-sounds in early phases of language learning. In English, language learners start articulating liquids relatively late. Their production is preceded by early articulation of nasals, stops and some of the fricatives (Khattab 2002:94). Late emergence of /r/-sound production in children's speech can be attributed to the physical complexity of the sound (Gimson 2001:209). The pronunciation of /r/ is highly variable and learners often do not master a mature production of the sound before the age of 6. A contrastive, mature production of /r/ in prevocalic contexts generally precedes that of postvocalic ones. Analyses show that /r/ is frequently replaced by /w/ and /v/ in initial positions, e.g. *rabbit* /wæbɪt/; *red* /vɛd/, or /l/ and /j/ e.g. *rain* /leɪn/, *room* /ju:m/, albeit less commonly. In rhotic accents of English, /r/ also happens to be deleted in initial consonant clusters and in medial and final position, e.g. *granma* /gɛ:ma/; *dress* /dɛs/; *very* /vɛi:/; *car* /ka:/ (Khattab 2002:94).

Thus, the field of language acquisition clearly provides evidence for the naturalness of /r/-deletion. It also gives us a clue as to why phonological change is phonetically motivated. When children acquire a language they perceive the old /r/-ful variant but find it too difficult to pronounce. Therefore the learners (i.e. their cognitive competences) automatically substitute the old, complex variant by a new, less complex one.

Better perception of natural features is another aspect of the checklist. The claim that natural features tend to be better understood than marked ones must be denied with regard to /r/. In this respect /r/ is more natural than the zero-variant as it is better perceived which in turn makes /r/-epenthesis more plausible. So, with regard to perception, the /r/-ful variant must be the preferred option. It appears that /r/ is perceptible natural especially in contexts where it occurs intervocalically. The /r/-ful variant serves as a means for better perception but in the same way /r/-deletion does not cause incomprehensibility among listeners. It may therefore be claimed that coda-/r/ has lost its original function as it is no longer needed for ensuring intelligibility and hence is phonologically redundant.

Although there is no empirical evidence provided that /r/, as an unnatural feature, is lost early in aphasia, it can be hypothesised that it is more likely to get lost if the speaker suffers of this linguistic defect.

According to the checklist, unnatural features are prone to change whereas natural features are averse to change. That /r/ was subject to change should be self-evident from this thesis. On top of that, natural features are said to occur very frequently in the various different context in a language. We have already seen that /r/ is reduced to onset positions nowadays and in addition to that, there is evidence of languages that do not even have /r/ sounds in their phonological system. According to Maddieson (1984 quotes by Dickey Walsh 1997:71) 70% of the world's languages have at least one rhotic sound. Considering the fact that there are so many different allophonic representations of /r/, this is not really a lot. Trills comprise 47,5 %, flaps and taps 38,3% and the next most common type is approximants totalling only 9,9%. As /r/ seems to be rather underrepresented compared to other sounds this must be additional evidence for /r/ being rather unnatural. Also we have already mentioned that coda /r/ in particular is a prime lenition site cross-linguistically (Harrison 1992 quoted in McMahon 1994:77).

This further indicates that /r/ is not only apt to get weakened or lost in British English but also in other large language (German, Dutch, Belgian French and Scandinavian only to mention a few) (cf. various contributions in Van de Velde & van Hout 2001). With regard to borrowing and loan words natural features also tend to prevail over unnatural ones. Therefore loanwords such as *Ricardo*, *alarm*,

concert etc. are pronounced without the postvocalic /r/ although they are still r-ful in those languages the word originates in. It may therefore be claimed that although speakers of English are aware of the word's foreign origin, they still apply the same lenitive processes as in native words.

To sum up briefly, /r/ was affected by lenition processes because the sound has unnatural qualities. As there is a general tendency for unnatural structures to become more natural it can be claimed that loss of /r/ is natural due to the following points:

the occurrence of /r/ is context-sensitive, only surfacing under certain contextual circumstances (i.e. intervocalically)

/r/-lenition are more likely to occur in fast, casual speech

/r/-loss is both lexically and phonetically gradual

loss of /r/ occurs cross-linguistically therefore it must be universally preferred or natural.

/r/-deletion is a very common process also within a language that is rhotic as there is evidence for its occurrence in language acquisition, aphasia, slips of the tongue and in borrowings and neologism

the disappearance of /r/ must be natural as it corresponds to the Vennemann's natural sound change principle: from a less natural towards a more natural structure

4.9.3 The actuation and implementation problem

So far it has been concluded that forms without coda /r/ are primarily beneficial for the speaker. /R/-loss as a speaker-friendly backgrounding process has the advantage of optimal pronounceability. We have also said that the change from an /r/-ful pronunciation to an /r/-less pronunciation spread gradually. However, this does not resolve the problem of how or why changes moved from one speaker to another. So far we have also failed to find any adequate account for the actuation of the process.

In order to account for the actuation and transmission of /r/-less forms, it needs to be determined who the “true” innovators and agents of the change were. Moreover the type of speech situation the change first occurred in must be considered. Above all, it needs to be borne in mind that external factors such as geographical region, sex, age, social class, and ethnic group reveal correlations of language variation. Now it becomes more and more obvious how complex linguistic change is. On the one hand language internal issues such as influence of “language hardware” on phonology need to be considered. On the other hand external factors have to be invoked as they also constrain change.

First of all we should like to tackle the problem of actuation. In NP the study of natural phonological processes in children’s speech has generated considerable attention (Donegan 1978:7). Young children are considered to be the prime generators of substitutions as they show new forms more frequently than grown-up speakers. Their limited articulatory abilities cause them to replace “difficult” segments and sequences for “easier” ones. In linguistic theory children are generally assumed to be more open to new variants as their language is “less corrupted” by language-specific regulations (Rödiger-Schluga 2004:42).

A central argument of Donegan’s study on natural phonology is that children are able to perceive distinctions long before they can physically produce them. Accordingly, it can be assumed that children typically know how to produce a segment or sequence “correctly”, meaning that their internal representations correspond to that of adult speakers. In fact substitutions of internal representations are only the natural reactions to articulatory inabilities. When learning the sounds and sound sequences of their native language, children will have to suppress more and more of these natural phonological processes (Donegan 1978:8). In spite of that, some processes continue to apply, albeit highly restricted of course. Children sometimes continue to make substitutions which do not surface in the language of other speakers. By failing to reproduce the input “correctly” they alter the phonological system of their language (Donegan 1978:10). As a consequence, their phonological system differs from the standard system.

Donegan also comments on the transmission of a change through a speech community. She presumes that phonetic change often is optional at first and only later becomes mandatory. Children, when they acquire a language, often manage to suppress or curb these natural processes in formal discourse but allow their application in informal speech situations. Thus it can be assumed that /r/-lenition processes were initially suppressed in certain speech styles. If the stylistic domain of the process is expanded and starts to spread to other registers, the new generation of learners (i.e. children) will only hear those forms which have already been subject to natural phonological processes such as lenition. The consequence is that these speakers will fail to suppress the processes entirely and only produce the /r/-less forms. This marks the point where the process becomes obligatory. In other words, if the change starts to apply as a rule and no surface alternations remain, speakers of the next generation may adopt the output of the process as the underlying representation of the segment or sequence. There is no reason for the learners of later generations to think that the representations could be different as they have never been exposed to other (older) variants. What distinguishes the later generations from the previous ones is that they no longer actively apply the weakening, neither do they consciously inhibit the process (Donegan 1978:11). Even if we can only hypothesize about it, it seems somewhat plausible that loss of coda-/r/ emerges in language users of early age.

Furthermore, it may be argued that a change to an r-less variety only emerges through active communication. Only if there is an exchange between two or more individuals, new forms can be created, stored and distributed among other speakers. In order for a new variant to become successful listeners must somehow respond to the speaker's communicative behaviour and vice versa.

Spreading can only take place in discourse within a community and therefore seems to be determined by social conditions. The higher the frequency of reproduction of a new variant the more speakers will be affected by the change in progress. Now, the real question becomes: why do some of the innovations pass in to oblivion while others thrive and prosper as they spread through the whole community. To put it in other words, why do certain instances of variation succeed and become established forms within a speech community while others do not? In

this respect, Labov argues for a distinction between the notion of ‘variation’ and ‘change’. While variation emerges through idiosyncratic speech habits and slip of the tongue, a change can only be labelled as such if a new variant is adopted by a group of language users, becomes systematic and acquires some social significance. It may therefore be inferred that “a certain word or pronunciation is indeed introduced by one individual. It becomes a part of the language only when it is adopted by others, that is, it needs to be propagated. Therefore the origin of change is its propagation or acceptance by others” (Labov 1972:277 quoted in McMahon 1996:248). Nonetheless, external social factors seem to be better for describing how a change spread but do not really shed much light on the actuation process.

One of the key-assumptions of NP is that natural processes are actuated in the mind or linguistic competence centre. With the brain being the source of innovation, a competence-based description of the whole innovation process appears to be particularly revealing. It can be assumed that both innovator and early adopters have to activate the processes in the brain first. Now, how could the diffusion of the novel variant best be illustrated? How could the new zero-variant emerge and establish itself alongside the established /r/-ful variant? Which phonological processes were involved? The first thing I should like to consider is how the change would look like if viewed from a phonological perspective. We may hypothesize how the new variant /ca:/ (*car*) might have become implemented in the brain alongside the established form /caɪ/. For this purpose, the model of human linguistic competence shall be taken into consideration. It may be hypothesized that a new variant has to pass through various different stages until it eventually gets established in the linguistic competence of an individual³⁴.

Phase 1: The starting point is an unchanged linguistic competence which has not been affected by the emergence of the innovative, r-less variant yet. So far the traditional form /caɪ/ is the only form existing in the speaker’s linguistic competence.

³⁴ If not stated otherwise, the description of the process of language change as it is represented in the human linguistic competence is taken from Rödiger-Schluga (2004: 44-46).

Phase 2 involves the emergence of a new variant /ca:/ which starts to exist alongside the established form in the linguistic competence of the innovator. Thus, from now on *car* is either represented as /caɪ/ or /ca:/. A language user displaying this linguistic brain state will consciously recognize the new variant, as he or she may have been exposed to the new variant before by engaging in discourse with other individuals. The more the listener is brought into contact with a new variant, the more pressure is exerted on the thitherto unchanged competence of the speaker. The result is that the new form will be added to the phonemic dictionary and represents an optional choice. However, at this stage the phonemic expression /ca:/ has not yet managed to establish itself next to the traditional form /caɪ/ in this individual's competence, but still only knows that it exists but hardly ever uses it himself. So, these individuals have already been confronted with /r/-loss in some way. Although they have the /r/-less form stored on the phonemic level and thus recognize these forms when confronted with them, these speakers continue to produce /r/-ful forms only.

Phase 3: The new form /ca:/ is getting more and more successful among language users compared to the traditional form. Thus, there is also more and more evidence for its popularity on the phonetic level as individuals already make use of the new variant in certain contexts within a certain community. However, the traditional form generally remains the more preferred option. On the competence level individuals shows both /r/-ful and /r/-less forms and both tend to be expressed in spoken discourse.

Phase 4: At this point /r/-less form are already produced very frequently and presumably enjoy an equal status together with the old form. Basically we are now dealing with the reverse situation of phase 2. At this stage some individuals exclusively makes use of forms in which /r/ is lost, but have the /r/-ful variant stored and so recognized the more traditional forms when exposed to it in discourse.

Phase 5: Lastly, the new form reaches the status of the more prominent variant as it is now fully established in the linguistic competence of the speaker. This instance will also be represented in the phonetics of the speaker as he or she will

exclusively make use of the /r/-less form /ca:/ . The older form seems to have been deleted entirely in the speaker's linguistic competence (Rödiger-Schluga 2004 45-47). It is of course understood that coda-/r/ already underwent all these stages since the change became effective several centuries ago.

The phonological development of the process of /r/-loss can be demonstrated as follows:

Figure 4: A modern phonological representation of the process of coda /r/-loss

(Ritt 2001 quoted in Rödiger-Schluga 2004:45)

<i>types of competences</i>		<i>phonological rules</i>	
C ₁	/car/	$r \rightarrow r$	unchanged competence
	↓		
C ₂	/car/	$r \rightarrow \emptyset$	/r/-less form optional
	[car], [ca:]		
	↓		
C ₃	/car/	$r \rightarrow \emptyset$	/r/-less form already less restricted
	[car], [ca:]		
	↓		
C ₄	/car/	$r \rightarrow \emptyset$	/r/-less form very frequent
	[car], [ca:]		
	↓		
C ₅	/car/, /ca:/	—	/r/-less form dominant
	[ca:], [car]		

In the graphical scheme the transformation from an /r/-ful to /r/-less phonology is illustrated in 5 different stages which represent (different) linguistic competences. It is of course possible that more or less stages are needed in order for the process to apply. The figure illustrates how a new variant exerts influence on the linguistic competence of one or more individuals in the course of time. Basically and essentially, the illustration shows in which way the brain is involved in coda /r/-loss.

Why certain substitutions become replicated by other speakers while others (the big majority) does not, will sadly remain as mysterious as ever, and we shall consider arguments that this issue may even be outside the domain of historical linguistics.

4.9.4 Spreading of /r/-loss within the speech community

Social class differentiation turns out to be a good indicator of ongoing linguistic change. Many socio-linguistically motivated changes show a strict adherence of language users to the norms set by the upper classes. Such changes are usually termed as “changes from above”. Norms set by the upper classes have overt prestige and operate above the level of consciousness where speakers are aware of linguistic variation. However, there are also changes that operate below the level of conscious awareness. They are labelled as changes from below and typically have their origin in the speech of the lower social classes. Initially, these variants are exclusively accepted within the dense social network of the speaker, but in the course of time they may also become established among the higher classes of the social strata (McMahon 1996:245-46).

The fact that /r/-dropping is a backgrounding process has repeatedly been pointed out in the course of this thesis. Natural backgrounding processes are usually associated with change from below meaning that an innovation has its starting-point in the speech of lower classes and gradually diffuses itself throughout the whole community.

Early, sporadic incidences of /r/-dropping give rise to the assumption that we are dealing with a change from below. Data evidence listed in chapter 3 table 6 clearly indicates that lexical items are more likely to be used in the speech of rural, vernacular speakers, particularly the peasant population. Moreover orthoepical evidence also shows that /r/-less speech started out as a marker of low social status and was long frowned upon by language purists whose primary intention was to restrain speakers from the “vices of vulgar”. However, it seems impossible to clearly state who the real initiators of /r/-loss were and which social

background they had as reliable evidence of spoken English of the late Middle and Early Modern English period is unfortunately not at our disposal.

Now, if we accept the hypothesis that the change to an r-less pronunciation emerged in fast, careless speech within a group of young and perhaps also lower class speakers we may proceed to the issue of how the process of /r/-deletion spread within the whole speech community. In this respect we turn to Dressler (1997 quoted in Rödiger-Schluga 2004:40) who asserts the claim that any diachronic change comprises a total of five stages from its emergence to the moment of complete ousting.

It is clear that any change in progress has to be initiated by a language user, the so-called innovator, who triggers a new form or innovation³⁵. Thus far, we have been focusing on the cause of the genesis of the new /r/-less variant. In the present study it has primarily been argued that the emergence of coda-/r/ weakening must be viewed as a reaction to physical strain in the first place. After all, change always starts out with the surfacing of an innovation. Whether the alternation can indeed be regarded as efficient and effective enough will come to light in the following stages.

In order to become successful, the new form then has to be adopted by other speakers. An adoption can of course only take place in discourse. If two or more people interact and negotiate meaning, instances of new forms can be created and passed on to other speakers within the community. Thus, the second stage of language change involves the internalization of an innovation by more and more speakers which are the early adapters.

If an innovation reaches the third stage it has established itself among even more individuals and already functions as the dominant variant within a whole social group. These social groups usually represent dense networks of speakers meaning that the speakers are closely knit to each other. This in turn facilitates the implementation of a new variant. If the innovative form establishes itself among a substantial amount of speakers, it will start to compete with the older forms. As a

³⁵ It needs to be stressed that an innovation need not necessarily be triggered by a single user could also be initiated by a number of speakers who start to use the new form independently.

consequence, language users will start evaluate the efficiency and effectiveness of the new form and weigh it against the previously more established forms. If the novel variant qualifies as the more beneficial one, the competing older ones will gradually be replaced among the various dialects and sociolects. Last but not least the final stage of a change has been completed if the old forms also disappear in the competence centre of speakers (Rödiger-Schluga 2004: 41).

So when approaching linguistic change not only aspects of natural phonological theory have to be borne in mind. Also sociolinguistic aspects seem to play a crucial role as they seem to resolve the conflict between speakers and listeners interests.

4.9.5 Context sensitivity of /r/-deletion and epenthesis

Although linking and intrusive /r/ are both well-documented phenomena of English phonology, it is still much debated how to account for their emergence in phonological theory. This part of the theoretical analysis aims to contribute to the debate by providing a natural phonological account of /r/-liaison.

Strictly speaking, we have so far been dealing with an elision process as the /r/-sound only got lost under certain circumstances. We have said before that lenition processes are typically context-sensitive (Donegan 1978:22). So usually it is assimilation and reduction are listed as typical lenition processes but our case shows that epenthesis also falls into this category. The crucial aspect about lenition processes is that they are phonetic demands of the speaker and work to make segments more pronounceable in the different contexts in which they appear. To put it in other words, lenition applies to optimize sequences of segments. Moreover they overcome difficulties associated with sequential combinations of features (Donegan 1993: 109).

Now, let us briefly recapitulate under which circumstances /r/-insertion occurs in non-rhotic dialects today (c.f. Donegan 1993:117-119). For instance in Standard British English /r/ occurring in a syllable-fall (i.e. before consonants or pauses) fails to maintain its /r/-colouring and turns into a schwa sound. The result of de-rhotacizing is a non-syllabic schwa, which tends to merge with a preceding

syllabic schwa. Because of this, final schwa surfaces in final or pre-consonantal position. Examples are:

A.

<i>butter</i>	[bʌtə]	<i>favour</i>	[fɛivə]
<i>hear</i>	[hɪə]	<i>pour</i>	[pɔə]

However, in pre-vocalic settings where /r/ would be the onset of the new syllable, /r/ surfaces again. Examples are:

B.

<i>butter it</i>	[bʌtər ɪt]	<i>favour it</i>	[fɛivər ɪt]
<i>hear it</i>	[hɪr ɪt]	<i>pour it</i>	[pɔr ɪt]

In Standard British English and also in other English varieties that show intrusive /r/, words and sequences that have final schwa when articulated in isolation or pre-consonantly, e.g.

C.

<i>India</i>	[ˈɪndiə]	<i>idea</i>	[aɪˈdɪə]	<i>drama</i>	[ˈdrɑ:mə]
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are articulated with linking /r/ when they occur before words or sequences starting with a vowel:

D.

<i>India and Pakistan</i>	[ˈɪndiər ən pɑːkɪˈstɑ:n]
<i>drama nd music</i>	[ˈdrɑ:mər ən mjuːzɪk]
<i>idea of</i>	[aɪˈdɪər əv]

This innovative and context-sensitive /r/ also surfaces after long, final /ɑː/s and /ɔː/s, albeit less frequently. Examples are:

E.

<i>Shah of Persia</i>	[ˈʃɑːr əv ˈpɜːʃə]
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Overall, the diachronic development of intrusive /r/ is rather straightforward. First of all coda /r/ was deleted or turned into a schwa-sound in some varieties. As a result, certain pairs such as *law* vs. *lore* or *spa* vs. *spar* no longer showed any contrastive features in most contexts. The only context in which the contrast could have been upheld was between vowels where the /r/ was re-syllabified into the onset of the following syllable (see table B above).

Next, it is claimed that the application of /r/ was reinterpreted and a “rule inversion” set in, that is, /r/ was not deleted completely as it got inserted intervocalically (Uffmann 2003:2). It seems that the use of /r/ was suddenly overgeneralized to all contexts linking /r/ is likely to surface in. According to Vennemann (1972 quoted in McMahon 2000:242) linking and intrusive /r/ arose by means of “rule inversion”. The original rule that determines the deletion /r/ in one environment is reinterpreted as a rule constraining its insertion in the opposite environment. Thus speakers reinterpreted the rule: /r/ > Ø/ __{C or #} and created a new rule, which specifies that /r/ is inserted after certain word-final words. So after the sound change “/r/ > Ø” was implemented in the speakers competences, they started to show an insertion rule rather than a deletion rule which can be described as follows: Ø > /r/ if V_{-high}__V (Uffmann 2003:3). All in all, the diachronic development that led to intrusive /r/ can be described without much difficulty.

However, it seems somewhat difficult to understand the motivation for the process to emerge in the first place. The claim that intrusive /r/ developed arbitrarily shall be refuted and it shall be demonstrated that /r/-epenthesis represents a natural process.

It may be claimed that it is more difficult to pronounce V_{-high}__V sequences without /r/ in linking environments. Speakers have to make a conscious effort to avoid the use of intrusive /r/ which seems to have the function of a “hiatus breaker” (Uffmann 2003:8). As regards the emergence of intrusive /r/ in the speaker’s competences, Donegan postulates the following. When “r in a syllable-

fall loses its r-colouring becoming ə” speakers hearing final schwa (or /ɑ:/; /ɔ:/) will “undo” the weakening to arrive at underlying final /r/. However, they may also, inappropriately, infer a lenition process in words such as *comma*, *spa*, *saw*, etc. and thus assume underlying /r/ here too. In Donegan’s opinion, “the ‘intrusive r’ does not, then, intrude because the speaker makes up an r-insertion rule. Instead, the r appears by analysis, when speakers assume that, because some final schwas represent /r/’s, other final schwas do so as well” (1993:119). That is, the change is purely perceptual: “speakers with intrusive r’s perceive final /ə/’s as /r/’s [while] speakers without intrusive r’s can perceive final schwas as /ə/’s’ (or they can ignore them)” (ibid).

It may therefore be concluded that intrusive /r/ results from underlying /r/s and emerged through analogy, or by perceptual recategorisation (McMahon 2000:247). In an effort-based approach it may therefore be inferred that in a linking environment words such as *Shah*, *draw*, *baa* and *India* are more effortful to produce without /r/, which gives the speaker no cause to delete the /r/ in that particular context.

5 An empirical study - approaching Luick's "r-Wirkungen"

It is generally accepted among historical linguists that between the late Middle English period and the late Early Modern English period a consonantal change had been at work that had strong repercussions on its preceding vowels. Syllable coda /r/, which was gradually lost in the Early Modern English period, is said to have altered its antecedent vowels both in terms of quality and quantity. One of the first to examine /r/-related developments was the famous Viennese linguist Karl Luick, and since then these changes are typically summarized by the term "r-Wirkungen" (Luick 1964:477). It is due to r-Wirkungen that apart from several exceptions, vowels developed into markedly different directions if they were followed by the /r/-sound within the same syllable. Compared to words such as *goose* or *mood* where the Great Vowel Shift perfectly applied and turned Middle English long closed /o:/ into Modern English long /u:/, words that possess an /r/ in their coda position seem to have gone astray. To make it more explicit, in words such as *door* or *board* the usual changes such as great vowels shift were not brought into effect since long closed /o:/ transformed into the long open /ɔ:/-sound instead of becoming a long /u:/. Thus Barber (1997:117) assumes that an /r/ following the vowels within the same syllable inhibited the changes that normally affected Early Modern English vowels in free position.

The approved though also rather sketchy way of describing "r-Wirkungen" is in terms of two distinct sound changes (cf. Luick 1964: 727; Lutz 1994:167, Brunner 1960:335; Pinsker 1974:54). On the one hand, short vowels became either one of the three long monophthongs /ɑ:/, /ɜ:/, /ɔ:/ if they preceded the /r/ within the same syllable. This can be illustrated by the long vowel in Modern English *star* which derives from Middle English short /e/. Moreover, it has been established that the long open /ɔ:/ sound in words such as *corn* or *horse* derive from Middle English /ɒ/. Likewise, the three short Middle English vowels /ɛ/, /ɪ/ and /ʊ/ that used to occur in words such as *her*, *bird* and *turf* all lengthened and developed into the long centring /ɜ:/- sound. On the other hand, long vowels followed by the /r/-sound transformed into centring diphthongs but have partly developed into monophthongs since then. To give a few examples: long closed /e:/ became the centring diphthong /ɪə/ such as in *dear*, *sneer* or *hear*; the long /a:/-sound became

the centring diphthong /eə/ such as in *care*, *fare* or *stare*; the long /u:/ sound developed into the centring diphthong /ʊə/ but has since been monophthongised to /ɔ:/ such as in *cure*; the long closed /o:/ sound developed into /ɔə/ but also developed into the long monophthong /ɔ:/ in the course of time as can be seen in examples such as *poor* or *lore*.

However, if we inspect these laws more closely there also seems to be something dubious about them. By summarizing r-Wirkungen in the above mentioned manner Luick and his fellow Neogrammarians apparently made an attempt at establishing so-called sound laws which should reflect a clear and consistent picture of the changes of English vowels in the environment of /r/. It was implied that the above mentioned laws would inevitably apply if a word met certain conditions.

In principle, sound laws construct phonological changes as exceptionless to regular (McMahon 1996:20). In addition to that it has been specified that sound laws exclusively apply “to sharply delimited classes of speech sounds and alter them under strictly defined phonological conditions” (Ritt 1994: 2). When Luick tried to back up and explain his findings he obviously thought of sound laws of the Hempelion kind, that is, he applied a scientific scheme of explanation that is typically utilized in the natural sciences. It appears fairly likely that the historical linguist deduced his explanandum via a law and a set of strictly defined premises (Ritt 1992:101). Presumably he structured his explanation as follows:

Tabel 13: Reconstruction of Luick’s pattern of explanation I

EXPLANANDUM: Why does ModE *large* have a long /ɑ:/?

EXPLANANS:

Law: Middle English short /ɑ/ lengthened into /ɑ:/ if it was followed by an /r/ within the same syllable.

Condition: In Middle English, the /ɑ/ in *large* was followed by an /r/ within the same syllable.

However, a more thorough examination of the entire set of laws that were proposed in connection with /r/-Wirkungen casts considerable doubt on their alleged universality. In this context it is somewhat peculiar that Luick illustrated his /r/-Wirkungen under as many as 26 (partly) incoherent paragraphs that occurred in different chapters of his magnum opus *Historische Grammatik der Englischen Sprache*. As regards the laws he proposed, it is particularly striking that in his explanatory notes that he added after almost every paragraph, Luick briefly discussed cases of individual words and dialectal deviations which did not correspond to the laws he put forward. By doing so, Luick's intention was to let the recognized variations appear as if they were isolated cases or "historical accidents" that simply happened for some reason. In traditional theories, any divergence from standard behaviour of sounds was regarded as a "spontaneous sound change". Conditioning factors such as phonetic context could not be determined, therefore changes were regarded as unmotivated or spontaneous (Hubmayer 1986:181).

When cataloguing all vocalic changes that were triggered by /r/ one will immediately see that the laws Luick stipulated actually could not apply 100% in each case since there are exceptions to be found that contradict his predictions. This can be inferred by comparing the law from above with the following law Luick came up with:

Table 14: Reconstruction of Luick's pattern of explanation II

EXPLANANDUM: Why does ModE *warden* have a long /ɔː/?

EXPLANANS:

Law: Middle English short /a/ lengthened into /ɔː/ if it was followed by an /r/ within the same syllable.

Condition: In Middle English, the /a/ in *warden* was followed by an /r/ within the same syllable.

It is certainly impossible for both laws to be entirely valid as each law bases its premises on the same condition, namely Middle English short /a/ followed by an

/r/ within the same syllable. Thus, it seems to be more of an “x either turned into y or z” scenario, as some of the vowels were likely to diverge and be substituted by more than one Modern English counterpart.

What we find is a surprising and so far unchallenged situation which reflects the change from one Middle English input sound to more than one present day English output sound. Essentially, the sound *x* did not necessarily have to develop into the sound *y* in all cases equally could have turned into the sound *z* in some cases. To put it in other words, incidences might be found in which the application of an established law were blocked. The laws can therefore no longer be regarded as sound laws per se and unification seems to have failed. What we actually find are statistical probabilities instead of the desired covering, universal and unexceptional laws. To demonstrate this in some more detail a complete list of vocalic chances triggered by the /r/- sound has been compiled.

Table 15: Complete list of r-controlled vowels

Middle English vowels before /r/	Modern English vowels before /r/	Examples
a	ɑ:	<i>large, sharp, art, etc.</i>
a	ɔ:	<i>warden, dwarf, etc.</i>
a:	eə	<i>fare, threadbare, etc.</i>
aɪ	eə	<i>fair, etc.</i>
e	ɜ:	<i>serve, certain, herb, etc.</i>
e	ɑ:	<i>star, harvest, etc.</i>
ɛ:	ɜ:	<i>were, early, etc.</i>
ɛ:	eə	<i>pear, bear, tear, etc.</i>
e:	ɪə	<i>year, ear, pear, pier, etc.</i>
ɪ	ɜ:	<i>first, church, mirth, etc.</i>
ɪ:	aɪə	<i>iron, hire, mire, etc.</i>
ɒ	ɔ:	<i>horse, corn, force, etc.</i>
ɔ:	ɔ:	<i>moor, hoard, etc.</i>
o:	ɔ:	<i>board, door, etc.</i>
o:	ʊə	<i>poor, moor, boor, etc.</i>
ʊ	ɜ:	<i>world, word, burn, etc.</i>
u:	aʊə	<i>our, shower, etc.</i>
u:	ɔ:	<i>course, etc.</i>

(Table 15 is based on data taken from Luick 1964³⁶, Pinsker³⁷ 1974 and Brunner 1960:332-344

³⁶ details of these changes cf. Luick §§ 505-511, 549-553, 559.560, 562, 564-570, 804

³⁷ details of these changes cf. Pinsker §§ 51, 58

According to this list of /r/-related sound changes it can be deduced that the Middle English sounds /a/, /e/, /ɛ:/, /o:/ and /u:/ have more than one Modern English correspondent. Clearly, Luick must have been aware of this fact otherwise he would not have implicitly mentioned the entire set of /r/-related sound changes in his book. Still there is reason to assume that he was implicitly downplaying an important methodological detail of his approach, namely the role of overgeneralization. Presumably, what Luick did was to choose a representative amount of examples that were compatible with the laws he established. However, at the same time he seems to have neglected incidences of variation. For instance, if we examine Luick's interpretation of the change affecting Middle English short /a/ which either became /ɑ:/ or /ɔ:/ in Modern English, we find a description which clearly stresses the change to long /ɑ:/ while the change to long open /ɔ:/ is only mentioned peripherally. Thus, at the beginning of § 560 Luick (1964:718) states the following:

Für me. *ǣ* vor *r* [...] ist [ā] auf dem ganzen Sprachgebiet, einschließlich Amerika, durchgedrungen.
 [Middle English *ǣ* was substituted by [ā] before *r* which affected the entire speech community, including the US]

Discussions about the change from Middle English short /a/ to Modern English long open /ɔ:/ can only be found in the explanatory remarks of the paragraph. In note 3 he briefly comments on the second possible change of Middle English short /a/ as follows:

Anm.3. An Stelle von [ā] in französischen Lehnwörtern erscheint in gewissen Fällen [ɔ:] [...]. Über die Gründe dieser Erscheinung vgl. oben §521,2 und 522 Anm.1 (Luick 1964:720):
 [note 3. In certain cases [ā] is substituted by [ɔ:] in French loan words [...]
 Reasons for this appearance see above § 521,2 and 522 note.1]

This side remark perfectly reflects how Luick dealt with the data that did not fit into his theoretical framework. Instead of denying the obvious existence of exceptions he mentioned them parenthetically. By doing so he managed to stay on the safe side of the line that separates his theory-driven behaviour from a serious scientific misconduct.

Still, the question needs to be raised whether it is scientifically tenable to select data intentionally instead of choosing it at random? Luick probably thought he had looked at all there was in the data and drew his conclusions from what his data suggested. Most contemporary scientists would of course disapprove of this kind of procedure as it is clearly biased and ultimately leads to predictable results. From the evidence Luick lists in each paragraph (which merely consist of a few examples) it can be seen that the items he selected do not represent a random sample of all the items on which the laws he put forth might have applied. If other potential inputs had been chosen, a different result would have manifested itself with the result that the laws he proposed could no longer be upheld in all cases, but only to a certain extent or with a certain statistical frequency.

Given this, the question needs to be raised: Why did Luick avoid making explicit that /r/-Wirkungen sometimes triggered the split of one vowel into two (or even three) different directions instead of operating unidimensionally; or why could he not bear the fact that he was actually dealing with statistical laws rather than covering ones? As regards this question Ritt (1992:102) provides a comprehensive answer:

Luick [...] strongly [...]clung to the view that the phonological development of (the English) language could be understood as a basically mechanistic system of straightforward laws [...]. It seems that Luick believed that in the end all apparent mysteries in the way in which a language developed could be shown to result from yet undiscovered regularity [...]. Essentially Luick seems to have believed, the development of a language must be as predicable as the working of a Swiss watch.

There is reason to assume that Luick's primary objective was to formulate covering laws in order to explain the phonological development of the English language. However, this seems to have come at the expense of studying a representative amount of data. Generally speaking, his approach to historical linguistics must be seen as:

an elaborate effort to tell a coherent and systematic story of English, which, in some places at least, sacrifices observable truth to system coherence or the magic appeal of modelling a linguistic microcosm that rests in splendidly hermetic harmony with itself (Ritt 1992:104).

Yet, if we prefer to remain close to the observable evidence on how vowels have been affected in the context of coda /r/, we have to abandon Luick's belief in the existence of covering laws. Instead, we need to accept that the laws he proposed may only be feasible if we interpret them as statistical laws since we will be confronted with incidences of apparent exceptions that contradict these laws.

By collecting, analyzing and interpreting a representative amount of data, the established laws will be challenged. Eventually, the aim is to assess how valuable they actually are, which shall be accomplished by indicating statistical probabilities of their application.

5.1 Sketching the approach

The following empirical analysis will focus on the implementation of r-Wirkungen among a representative random sample of lexemes – wordforms, so to speak, which were likely to undergo processes causing a combination of vocalic changes due to the impact of the following /r/. In order to do this the following steps have to be taken:

To begin with, a sample of Modern English words displaying /r/-deletion whose existence can at least be traced back to Middle English has to be compiled to compare the situation of before and after the changes took place. Then, the Modern English phonetic realisation of the vowel preceding coda /r/ has to be determined for each word. Next, we will be confronted with the task of reconstructing the realization of their Middle English counterparts. Admittedly, this is a rather daring venture because reconstructions of Middle English phonetic details are generally regarded as unreliable especially when it comes to specifying the exact quality and quantity of vowels.

As regards to the reliability of data, this has always been an issue for historical linguists who were concerned with the data of a particular linguistic phenomenon. If we want to find out more about the previous stages of a language we can only avail ourselves of a few sources of information. In particular, conclusions can be drawn from areas such as spelling evidence, orthoepical material or metrical

poetry. However this kind of evidence is still very inconclusive, therefore hardly more than an approximate reconstruction is possible.

Needless to say, we should remain critical when tracing back features of a language to previous times because not all evidence that appears to be of value for our task will eventually turn out to be useful. Thus it has to be admitted that there are certain limitations for an historical analysis that cannot be overcome by any means. Besides it should be kept in mind that we are actually studying a spoken phenomenon yet the only evidence we have is based on the writing of a particular language community living at a particular time and place. The lack of evidence of spoken English at that time leaves us with a further problem which is a general dilemma in the field of historical linguistics. However, with regard to this empirical study it must be said that, between the late Middle English period and the Early Modern English Period, the English language had not yet been subject to standardization, since this was an undertaking initiated by language purists and conservative grammarians of the late 18th century³⁸. Therefore it can be assumed that the written language (more or less) reflects the spoken language of that time. Now, let us leave the discussion on language reconstruction behind and proceed to the question of what can actually be anticipated from the collected data.

By holding the Middle English data (= words that have not yet undergone the changes that were triggered by the phenomenon of r-Wirkungen) against their Modern English correspondents (= directly related words that have been subject to r-Wirkungen) we will hopefully be able to illustrate how many elements have in fact been influenced by the processes under consideration. Presumably, the comparison of the phonological situation of before and after the event will show that the majority of Middle English vowels have in some way or other been affected by the succeeding /r/ sound. Still there is good reason to believe that the way in which vowels had been affected was by far less regular than Luick and his Neogrammarians followers had proposed. Hence, cases are expected to be found where one Middle English input vowel was altered and engendered more than one Modern English output vowel (see table 15 above).

³⁸ Strictly speaking, spelling conventions and language standardization began much earlier (i.e. 14th C onwards). However, big spelling reforms are clearly a product of 18th century grammarians.

By comparing each set of input items with their corresponding outputs I will hopefully be able to demonstrate how many different outputs were in fact generated. Basically and essentially I will be testing Luick's predictions by replicating his study on r-Wirkungen. The results will hopefully serve as a proof to refute Luick's hypothesis of 'exceptionlessness'. Rather than leave it at that, a thorough analysis of the data shall be conducted in order to see if the so-called exceptions also exhibit lawful or rule- governed properties that might eventually eliminate the largest set of apparent exceptions to Luick's laws on the influence of /r/.

Therefore I would like to hypothesize that it is indeed possible to detect some patterns of uniformity behind these r-related changes if we analyse a representative amount of data. To put it in Verner's words:

There must [...] exist a rule for the irregularities; the task is to find this rule
(Verner 1978: 36 quoted in McMahon 1996:17)

Such a hypothesis might seem rather bold, especially to those who ascribe themselves to the more recent schools of linguistic theory where diachronic research on the motivation of phonological changes does not seem to be high on the agenda. Therefore the "rules" I would like to postulate will be described in terms of tendencies or probabilities rather than of apodictic certainties. In this respect the present study departs radically from the dogmatic style of the Neogrammarian approach towards the history of language.

In any case, which properties or parameters is one supposed to look at in order to gain an insight into the alleged regularity of the different sound changes triggered by /r/? A useful concept for finding parameters is that of "structural-phonological constraints" (Ritt 1994 ff.). In his 1994 attempt at unifying quantity changes of Early Middle English stressed vowels, Ritt made use of such constraints which eventually led him to a number of interesting findings concerning the application of quantitative changes. In principle it has been suggested that two different types of constraints can be used for finding correlations between the different outputs. On the one hand socio-stylistic constraints are listed as they are assumed to trigger

phonological changes due to factors such as speech tempo or level of formality³⁹. On the other hand the relevance of language-internal or structural-phonological constraints was stressed. These constraints can be characterized as factors conditioning the change of a particular sound due to the nature of its phonological environment. In the case of Ritt's study, the examination of the types of consonant (clusters) following the affected vowel happened to be particularly revealing.

To envisage the explanatory power of the two factors, imagine the following case: Middle English short /a/ in the context of coda /r/ either transformed into /ɑ:/ or /ɔ:/. Hence Middle English /a/ has two different Modern English counterparts with /a/ having lengthening in both cases. It seems that the question of "phonemic split" cannot be solved by only taking socio-stylistic constraints into account as both instances exhibit processes of lengthening. Therefore the second type of constraint needs to be taken into consideration. With regard to Ritt's investigation it can be expected that the phonological environment of a vowel exerts a remarkable influence on itself, causing the vowel to change in quality and length.

In my own investigation of r-Wirkungen I will therefore also compile a set of parameters that are likely to have conditioned the changes. Since there are hardly any reliable sources as to whether a wordform used to be a typical constituent of a particular speech style or tempo during the Middle English period, socio-stylistic constraints shall be ignored altogether. Instead phonological constraints shall primarily be focused on as they can be defined and categorized without much difficulty.

The collected data along with their constraints shall serve as a means to readdress and estimate the general validity of the laws Luick postulated regarding the influence of coda /r/. However, for the investigation it will be insufficient to simply compare the collected diachronic correspondences and quantify the different options of Modern English outputs. With the aid of structural phonological constraints it will be possible to follow up on the question whether

³⁹ As Ritt was concerned with constraints on the application of lengthening processes, he assumed that the change from a short to a long vowel might have taken place more frequently in slow hypercorrect and formal speech than in situations where speakers use a lower register and tend to speak faster. This kind of change can be regarded as a typical example of a foregrounding process.

the exceptions to Luick's laws still exhibit regularities. It shall be examined if there is an underlying schema that explains why the application of the established rules came into effect in some cases but not in others. As we subscribe to the view that processes of whatever kind (lengthening, diphthongization, ect.) can never be fully implemented among all possible entities, the objective of the analysis will be to deconstruct common patterns that emerge from the data. In due course, it shall be demonstrate that we are not dealing with completely random processes.

Instead of describing sound changes between Middle English and Modern English in the manner of covering laws where the Middle English sound 'x' always and inevitably turns into the sound 'y' in Modern English, statistical laws or tendencies will be used. Statistical laws are particularly useful for describing the sound changes under consideration because absolute regularity is only a myth and the English language is full of exceptions.

5.2 Data analysis

Before we proceed to the statistical analysis of the data, some aspects concerning the data collection shall be discussed. As stated above, the study is based on a corpus of lexemes which can be interpreted as potential candidates for undergoing 'r-Wirkungen' as they all posses an /r/ phoneme in their syllable coda. The data was gained by using the *OED on CD-ROM*, a digital version of the Oxford English Dictionary. Having an electronic source at one's disposal clearly facilitated the data collection process because a great number of words could readily be found by conducting a wild-card search. The search criterion was to find Present Day English words which contain a coda /r/ sound and already existed in the Middle English period. With a total of 698 words, the corpus is incomplete as it only covers a fraction of the entire amount of potential candidates. However, the data can doubtlessly be regarded as a representative sample for the present empirical study.

All in all, the data was classified according to 21 parameters (see appendix). As regards the choice of phonological constraints, practically the complete environment of the vowels in question was defined. On the one hand, phonological parameters such as vowel quality and quantity, the successive and

antecedent context of the /r/ and the syllable position the /r/ occurred in were considered. On the other hand two non-structural-phonological factors were also taken into account, namely etymology and lexical category. With respect to the morphosyntactic categories, a distinction between nouns, verbs, adjective, adverbs, prepositions and conjunctions was made. Moreover, the etymological background of each word was defined by distinguishing between Romance and Germanic origin.

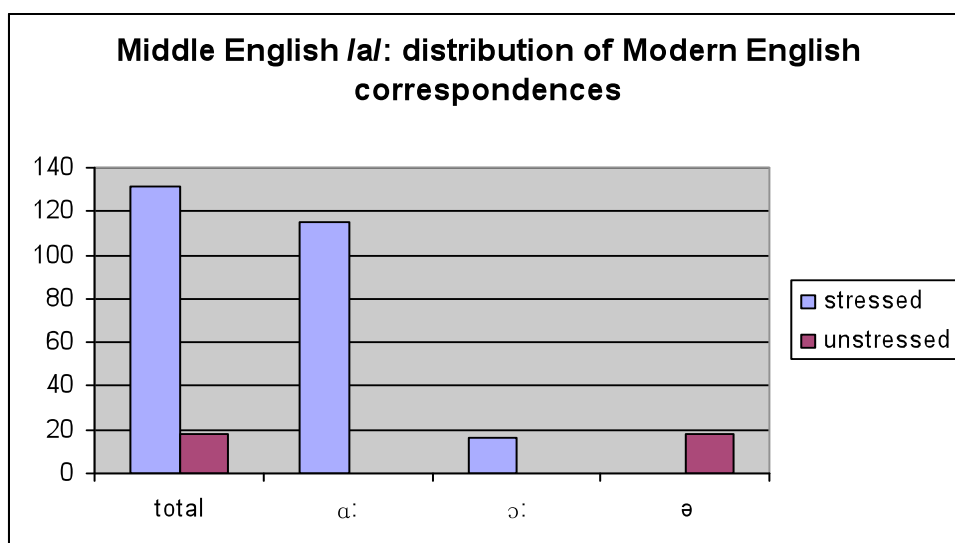
In the following, the data will be divided into subgroups according to the different Middle English vowels preceding coda /r/. Each group of Middle English vowels will be compared to their Modern English correspondences. First, it shall be determined how many different Modern English correspondences the sound exhibits. Furthermore, these numbers have to be translated into percentages. Above all it shall be examined whether or not the various outputs exhibit any serial correlations or common patterns within their subgroup. As the focus of the analysis lies on the identification of factors that caused variation among r-influenced vowels, discussions in this chapter will therefore predominately centre on this phenomenon.

5.3 The results of the empirical study of ‘r-Wirkungen’

5.3.1 Analysing Middle English /a/ and its Modern English correspondences

On the basis of table 15, it can be deduced that coda /r/ did not always and inevitably trigger a transformation from Middle English /a/ to Modern English /a:/. Certain instances are to be found which yield a different result. The results are given in the following section.

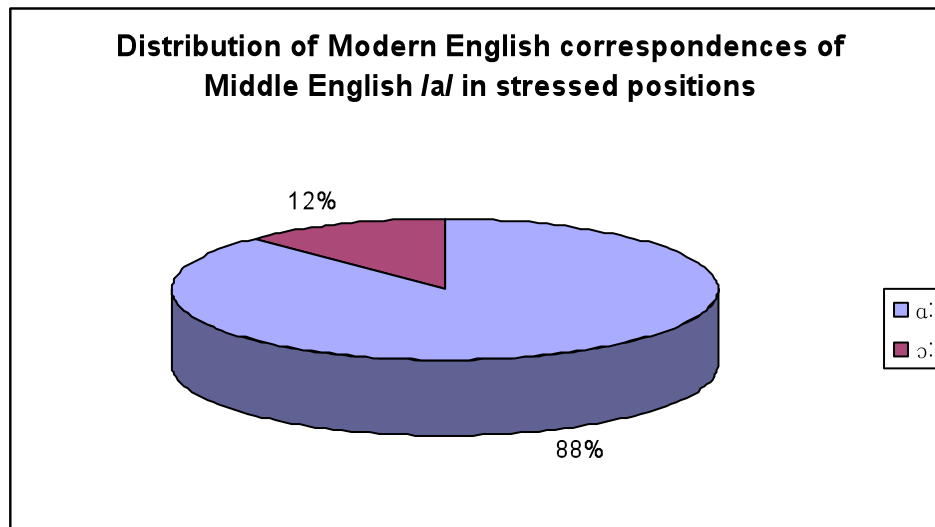
Graph 1:



Graph 1 shows that the Middle English input /a/ produced three different outputs in Modern English namely /ɑ:/, /ɔ:/, and /ə/. It is apparent that items holding an /r/ in unstressed positions are underrepresented in the data. In fact, the relative proportion of r-controlled words in unstressed positions can be expected to be much higher. However, this shall not be the major concern of the analysis because it can be anticipated that unaccented positions are not indicative of variation. As for schwa, it is generally agreed that it has a very high frequency of occurrence in unstressed syllables (Gimson 2001:127). Accordingly Heselwood (2006:78) acts on the assumption that schwa historically derives from ‘constrictive /r/’ in final unaccented positions⁴⁰. It is therefore predictable that schwa surfaces throughout in this position. As a consequence, the results for unstressed syllables are rather uninspiring as Middle English /r/ turned into /ə/ in each and every case. Stressed positions, however, produce a less consistent picture as can be concluded from graph 2.

⁴⁰ At the same time Heselwood admits that his assumptions are only valid if the existence of what J.C. Wells in his ‘standard lexical set’ system refers to as ‘commA-words’, is neglected. These words have never had a final constrictive /r/ yet they also exhibit a schwa in final positions.

Graph 2:



The pie chart shows that the majority of Middle English r-controlled /a/ sounds occurring in stressed position were lengthened and developed into /ɑ:/, a new phoneme in Modern English (Gimson 2001:116). Yet the results are not stringent enough to reveal a ‘sound law’ as the changes effecting 12% of the items seem be somewhat at odds with the usual processes. In these cases a long open /ɔ:/ sound manifested itself. Now the question needs to be raised as to how the existence of exceptions can be accounted for. For this purpose we need to draw on the various constraints that have been established in the data base. If a relatively large number of items that inhabit an /ɔ:/ was influenced by the same characteristics it can be concluded that these parameters triggered the change to /ɔ:/.

The data clearly reveals that the implementation of /ɔ:/ strongly depended on one constraint, namely the onset of the syllable.

Table 16: Examples of Modern English /ɔ:/ outputs:

Mod E word	Mod E vowel (output)	ME vowel (input)	Onset of r-syllable (PoA)	Onset of r-syllable (MoA)
dwarf	ɔ:	a	bilabial	approximant
quart	ɔ:	a	bilabial	approximant
swarm	ɔ:	a	bilabial	approximant
swarth	ɔ:	a	bilabial	approximant
thwart	ɔ:	a	bilabial	approximant
toward	ɔ:	a	bilabial	approximant
war	ɔ:	a	bilabial	approximant
ward	ɔ:	a	bilabial	approximant
warden	ɔ:	a	bilabial	approximant
warm	ɔ:	a	bilabial	approximant
warn	ɔ:	a	bilabial	approximant
warp	ɔ:	a	bilabial	approximant
warsle	ɔ:	a	bilabial	approximant
whart	ɔ:	a	bilabial	approximant
wharf	ɔ:	a	bilabial	approximant
wharve	ɔ:	a	bilabial	approximant

As shown in the table, a change to /ɔ:/ exclusively took place if the sound was preceded by the labio-velar approximant /w/. As /w/ surfaces in all eligible instances it can be assumed that the sound conditioned the change from Middle English short /a/ to Modern English long /ɔ:/. Therefore we are not in fact dealing with exceptions but rather a sub-regularity which implies that the change to /ɔ:/ still correspond to the Neogrammarian notion of ‘exceptionlessness’. Thus, the sound law /a/ >/a:/ if followed by an /r/ within the same syllable needs to be reformulated as /a/ >/a:/ if followed by an /r/ within the same syllable unless directly preceded by the labio-velar approximant /w/.

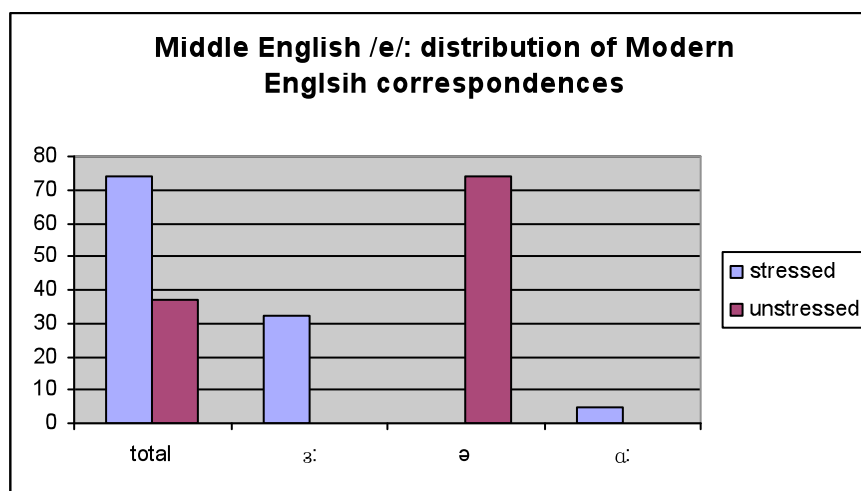
It needs to be stressed that these findings have already been identified and described in the Neogrammarian literature, albeit in another context and

framework. Accordingly, Pinsker (1974: 56) rightly points out that in case a /w/-sound anteceded short /a/ in Middle English, the vowel did not undergo the Second Vowel Shift⁴¹ and eventually changed to /ɔ:/ by the 18th century⁴².

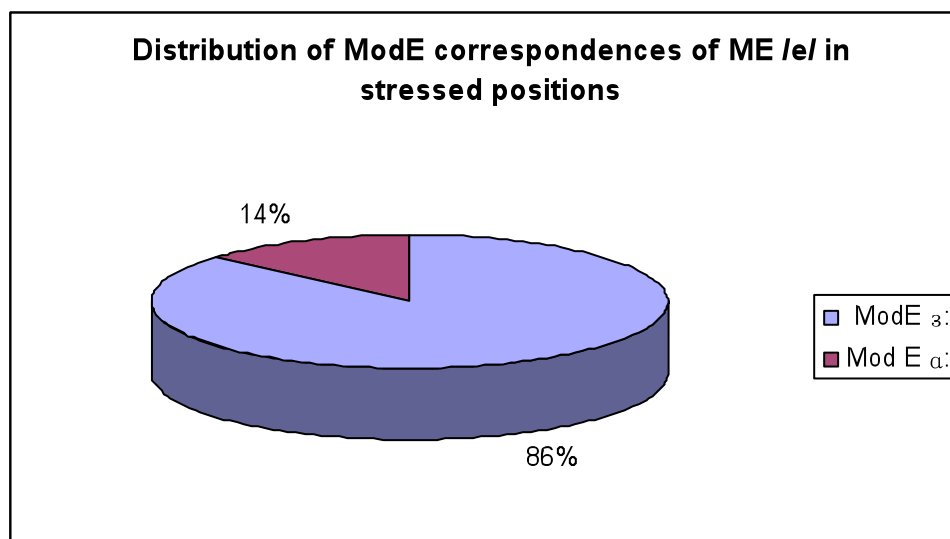
Given this, the results that we get do not yield the expected statistical tendencies but produce watertight laws instead.

5.3.2 Analysing Middle English /e/ and its Modern English correspondences

Graph 3:



Graph 4:



⁴¹ It has been argued that the “Second Vowel Shift” caused /u/ and /o(:)/ to centralise, become unrounded and lowered but raised and fronted /a:/ (Schendl & Ritt 2002)

⁴² Pinsker (1974:53) notes that if Middle English short /a/ was preceded by a /w/ sound, it underwent the same processes as the /a/ that derived from Middle English /o/. Although the two sounds had a different origin they share the same course of development.

Table 16: Which parameters might have conditioned the change?⁴³

Impact of cluster vs. single consonant		
Both types of changes	abs.	%
Single /r/	4	11
Cluster (rC)	33	89
Change: /e/ >/a:/	5	14
Single /r/	1	25
Cluster (rC)	4	14
Change /e/ >/ɜ:/	31	86
Single /r/	3	75
Cluster (rC)	29	86

Although it can be observed that the lengthening to /a:/ was more likely to be implemented before clusters than before single consonants, this also holds true for the change to /ɜ:/, which can be put down to the fact that there is generally a much higher frequency of occurrence of items with consonant cluster than items with single consonants. Thus, it needs to be taken into consideration that the statistics present a distorted picture of the inputs.

Table 17:

Impact of class of post-/r/ consonant					
/e/ > /ɜ:/			/e/ > /a:/		
Classes of post-/r/ consonants	abs.	%	abs.	%	
Ø	3	75	1	25	
Affricate	2	66	1	33	
Voiceless Fricative	12	92	1	8	
Voiced Fricatives	2	66	1	33	
nasals	3	100	-		
Voiceless Stops	6	86	1	14	
Voiced Stops	3	100	-		

⁴³ The table shows three different sub-sections: 1.) Both types of changes; 2.) the change to /a:/; 3. the change to /ɜ:/ (dark-grey lines). As the focus is on the constraint “post-/r/ context” it needs to be compared how often final /r/ inputs showed /a:/ and /ɜ:/ respectively. So, when comparing the percentages of each change single-/r/ contexts and cluster contexts need to be compared. In this case, 25% of all relevant single-/r/ inputs turned into /a:/ while 75% turned into /ɜ:/. The same interpretation procedure applies for clusters of course.

When examining the post-/r/ context of both Modern English variants, no clear-cut conclusion can be drawn on how the various classes of consonants conditioned the changes. Generally speaking Middle English /e/ was far more likely to change into an /ɜ:/-sound than into an /a:/-sound. However, instances are to be found that are indicative of different preferences.

The table generally distinguishes between vowels that are followed by a single r-consonant and vowels that are followed by consonant clusters (r + C).

In the case of final /r/ it can be seen that the vowel preferably changed into the long central /ɜ:/-sound and statistically speaking only every fourth Middle English sound under consideration became an /a:/-sound in Modern English. The table also shows that 66% of all words containing an r + affricate-cluster show vowel lengthening and centralization to /ɜ:/ in the course of time. The same numbers apply for r + voiced-fricative clusters. As the last part of the table shows, lengthening to /ɜ:/ was most likely to be implemented if followed by r + voiceless stop, r+ voiced stop, r + nasals and r + voiceless fricative clusters. Thus, general statements about vowel change in the context of post-vocalic /r/ and its relation to consonantal classes succeeding the vowel do not seem to be very illuminating.

Table 18:

Etymology				
/e/ > /ɜ:/			/e/ > /a:/	
origin	abs.	%	abs.	%
Germanic	3	60	2	40
Romance	29	94	3	6

The table shows a higher representation of words with a Romance origin than Germanic origin. According to the table, it was highly likely for Middle English /e/ to change to /ɜ:/ if the word had a Romance origin as only 6% of all words exhibiting a Latin root developed into long /a:/ sounds. However, the figures suggest one thing very clearly: The probability for Germanic items to have an /a:/-sound in Modern English is significantly higher than for words with a

Romance origin. This can be put down to the fact that Germanic words are highly underrepresented in the related data.

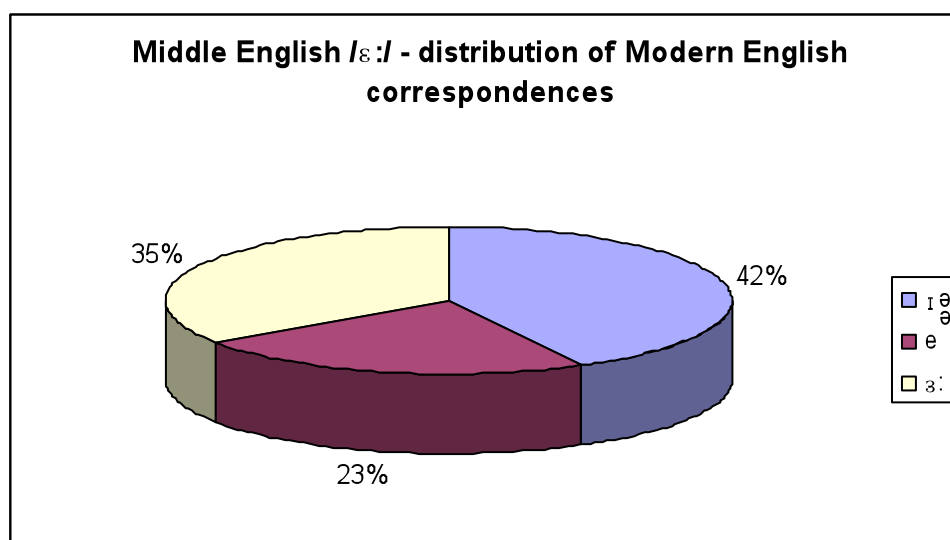
Table 19:

Syntactic category				
/e/ > /ɜ:/			/e/ > /a:/	
word class	abs.	%	abs.	%
nouns	17	81	4	19
verb	7	88	1	12
adjective	5	100	-	0
adverb	1	100	-	0
pronoun	1	100	-	0

As shown in table 19, a change to /a:/ seems to have been most likely among nouns, less likely among verbs and unlikely among adjectives, adverbs and pronouns. Clearly, these figures do not really speak a clear language. Thus, generalizations with regard to the significance of syntactic category are very difficult to make.

5.3.3 Analysing Middle English /ɛ:/ and its Modern English correspondences

Graph 5: Distribution of Modern English correspondences of ME /ɛ:/



The pie chart displays a graphical view of the three different Modern English outputs of Middle English /ɛ:/. What is striking in this case is the relatively even distribution of the three possible outputs in Modern English. Owing to this equal division no preferences can be anticipated and it seems that the lines between

more preferred and less preferred sound change are blurred. This stands in staunch opposition to all other /r/- influenced vocalic changes that have been analyzed so far. In comparison to Middle English /a/ and /e/ which both had a clearly preferred variant, this can no longer be maintained in the case of the sound changes at hand. Therefore selected parameters need to come under scrutiny to determine whether there are features favouring a change into a certain direction or not. Moreover possible factors causing the general variability and incoherence of the sound change of Middle English /ɛ:/ shall be discussed and studied.

Table 20: Which parameters might have conditioned the change?

Impact of cluster vs. single consonant		
All types of changes	abs.	%
Single /r/	17	65
Cluster (rC)	9	35
Change ɛ: > eə	6	23
Single /r/	6	100
Cluster (rC)	0	0
Change /ɛ:/ > /ɜ:/	9	35
Single /r/	1	11
Cluster (rC)	8	89
Change /ɛ:/ > /ɪə/	11	42
Single consonant	10	91
Cluster (rC)	1	9

According to the table above a change to /ɜ:/ was highly likely if followed by a consonant cluster. In contrast to that, a change from ɛ: > eə and /ɛ:/ > /ɪə/ was highly likely if followed by an /r/ only. Despite a generally higher level of variation in that particular sound change it is the centring diphthong /ɪə/ that has the highest output level in the study.

Table 21:

Impact of class of post-/r/ consonant⁴⁴						
ɛ: > eə			/ɛ:/ > /ɜ:/		/ɛ:/ > /ɪə/	
Classes of post-/r/ consonants	abs.	%	abs.	%	abs.	%
Ø	6	35	1	6	10	59
voiceless stop	0		2	100	0	
voiced stop	0		0		1	100
voiceless fricative	0		3	100	0	
nasal	0		3	100	0	

In case Middle English /ɛ:/ was followed by a final /r/, the /ɪə/-sound seems to have been the preferred output variant in Modern English as it can be found in the majority of these settings. However, with a rate of 35%, /eə/, another centring diphthong, seems to have been a popular option too. Only /ɜ:/ clearly appears to be the less preferred sound in final-/r/ settings. Conversely, the data reveals that in an environment of /r/ + voiceless stop or /r/ + voiceless fricative or nasal the only and therefore also preferred Modern English counterpart is the /ɜ:/-sound. It can therefore be assumed that these clusters had the most powerful impact on the shift to /ɜ:/. In the event of an /ɛ:/-sound colliding with either of the three consonant classes (voiceless stop, voiceless fricative, nasal) the vowel could be expected to centralize and lax to /ɜ:/. Zero consonants and voiceless stops on the contrary seem to be less influential in the transformation to /ɜ:/. It is generally striking that almost all vowels that were followed by a final /r/ sound diphthongized to either of the two centring diphthongs /eə/ or /ɪə/. Cruttenden (2001:143ff.), in his description of Modern English vowel quality, denotes for both central diphthongs that they came into being due to the loss of post-vocalic /r/ in the context of /ɛ:/ which was gradually replaced by /ə/ in the 18th century.

⁴⁴ How to read the table: The table shows which post-/r/ consonants might have constrained the change to a particular Modern English output. The absolute and relative numbers again show how often ME /ɛ:/ changed to one of the three possible Modern English counterparts. Since many inputs only have one output-possibility the table shows quite a lot of zero-values.

Table 22:

Etymology						
/ɛ:/ > /eə/			/ɛ:/ > /ɜ:/		/ɛ:/ > /ɪə/	
Origin	abs. 6	%	abs. 9	%	abs. 11	%
Germanic	4	67	3	33	8	73
Romance	2	33	6	67	3	27

As evident from the table above, vowels in words with Romance origin were more likely to transform into /ɜ:/ sound, whereas vowels in words with a Germanic origin were more likely to develop into either of the two centring diphthongs /ɪə/ and /eə/. This corresponds with the findings about consonantal class. Hence, it can be anticipated that words exhibiting a Latin root and containing an r + nasal or r + voiceless fricative or voiceless stop cluster in their syllable coda, were highly likely to possess an /ɜ:/ sound in their nuclei in Modern English.

Table 23:

Onset of r-syllable (Place of articulation)						
/ɛ:/ > /eə/			/ɛ:/ > /ɜ:/		/ɛ:/ > /ɪə/	
Onset (PoA)	abs.	%	abs.	%	abs.	%
bilabial	3	33	2	22	4	44
Velar	1	33	1	33	1	33
Alveolar	1	16	1	16	4	66
Palatal		0	2	66	1	33
Labiodental		0		0	1	100
dental	1	100				
Ø			3	100		

Table 23 examines the potential impact of the syllable onset on its nucleus. At this point it needs to be stressed that for the sake of facilitating the data analysis, only those consonants directly preceding the vowel were taken into account, meaning that consonant clusters were disregarded. Thus words with initial clusters, which would in fact have to be labelled as “alveolar-bilabial” for example, were ignored.

Only the places of articulation of the consonants directly in front of the vowel were taken into consideration. The data suggests that in case Middle English /ɛ:/

was immediately anteceded by a bilabial onset, the vowel was most likely to become an /ɪə/-sound, a little less likely to become an /eə/-sound and least likely to become an /ɜ:/-sound in Modern English. It needs to be emphasized that although a more preferred onset can be established, the data does not seem significant enough to state clear preferences. Moreover no preference whatsoever can be determined if the Middle English vowel was preceded by a velar consonant. On the basis of the table it is equally likely for /ɛ:/ to become an /eə/ sound than to become an /ɪə/-sound or /ɜ:/-sound respectively. Alveolar sounds standing prior to the /ɛ:/ vowel mainly exhibit the centring diphthong /ɪə/ as their Modern English counterpart. If a word contained a labio-dental consonant in the antecedent position only /ɪə/-sounds emerged. In an onset positions dental consonants exclusively triggered /ɜ:/-sounds in Modern English, but if the nucleus had an empty onset (Ø-consonant) only long, central /ɜ:/-sounds unfolded.

A number of clear preferences could be established from the data. However, it can be doubted whether the place of articulation of the onset is really that influential in the end. On the one hand it seems that the onset position does not have a deep impact on the transformation of its following verbs and therefore lacks significance. On the other hand, the findings in chapter 6.3.1 already revealed that the onset indeed had a crucial impact on the shift from one Middle English vowel to another Modern English vowel. In this particular case the labio-velar onset /w/ always and inevitably triggered a change from Middle English /a/ to Modern English /ɔ:/.

Table 24:

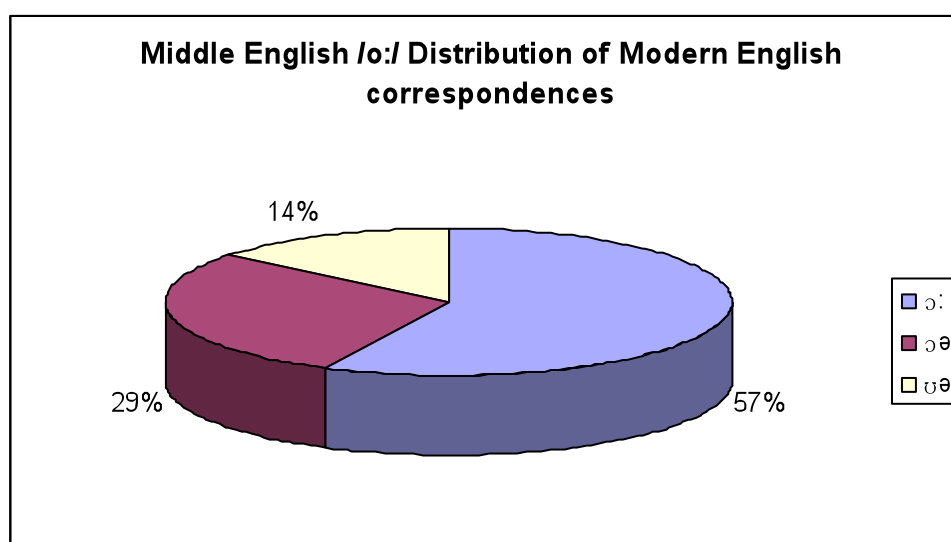
Syntactic category						
/ɛ:/ > /eə/			/ɛ:/ > /ɜ:/		/ɛ:/ > /ɪə/	
word class	abs.	%	abs.	%	abs.	%
Noun	2	15	6	46	5	38
Verb	2	22	3	33	4	44
Adjective					2	100
Adverb	2	100				

The data suggests that for most Middle English nouns a shift from /ɛ:/ to /ɜ:/ was the preferred option. At the same time a change to /ɪə/ was only slightly less

preferred but only a few nouns show an /eə/ sound in their nucleus today. The majority of verbs have the central diphthong /ɪə/ in their nucleus. Nevertheless, a clear preference can not be stated as a shift to /ɜ:/ and /eə/ was almost equally likely. For adjectives and adverbs the amount of data seems to be insufficient therefore these two word classes shall be neglected.

5.3.4 Analysing Middle English /o:/ and its Modern English correspondences

Graph 6: Distribution of Modern English correspondences of Middle English /o:/



As can be seen from the diagram, the distribution of Modern English counterparts of /r/-controlled Middle English /o:/-sounds is somewhat diverse. In over 50% of all cases the nucleus shifted to the relatively long, back, open /ɔ:/ sound. Almost a third of all Middle English /o:/vowels affected by a postvocalic /r/ changed to /ɒ/ and in a few other cases we can find the output /ʊə/.

At this point it seems worthwhile mentioning that in the course of time /ɔə/ merged with /ɔ:/ and /ʊə/ for the majority of RP speakers which is due to an imbalanced pattern of centring diphthongs with /ʊə/ being the only back glide, as opposed to the two front glides /ɪə/ and /eə/ (Gimson 2001:145). Gimson comments on the process of coalescence as follows:

[...]The first element of /ʊə/ can be lowered considerably without risk of confusion. Thus several words with /ʊə/, which have a pronunciation /ʊə/ for some RP speakers, are given by others a glide /ɔə/, e.g. in *poor, sure*. This glide /ɔə/ may in turn be levelled with the realization of /ɔ:/ . So *Shaw, sure, shore*, still pronounced by some as /ʃɔ:/, /ʃʊə, /ʃɔə/ are levelled by many others to /ʃɔ:/ for all three words [...].

Whether these three Modern English counterparts should still be considered as “three different” correspondences or rather as slightly modulated variants of one single phoneme, is subject to dispute. After all, there is strong evidence of a sound change to one single sound, the only difference being that the vowel quality is not always exactly the same. In some cases the vowel is lowered a bit and is rounded off in a glide while it is lengthened in others. Given this, socio-stylistic factors such as level of formality and speech tempo should be examined instead as they can be expected to be more revealing than the structural-phonological factors of this study.

Table 25:

Impact of cluster vs. single consonant		
All types of changes	abs.	%
Single /r/	7	50
Cluster (rC)	7	50
Change /o:/ > /ɔə/	4	29
Single /r/	3	43
Cluster (rC)	1	14
Change /o:/ > /ɔ:/	8	57
Single /r/	2	29
Cluster (rC)	6	86
Change /o:/ > /ʊə/	2	14
Single consonant	2	29
Cluster (rC)	0	

From the table it can be concluded that the two glides /ɔə/ and /ʊə/ are extremely likely to occur in a final-/r/ syllable. Especially for the latter sound it can be estimated to occur with an absolute certainty of 100% if followed by a syllable final /r/ sound only. The reverse can be stated for the shift from Middle English /o:/ to Modern English /ɔ:/ . The data reveals that in 86% of all cases, a change to the more open sound took place in the environment of consonant clusters.

Generally speaking it can be assumed that the single consonant /r/ brought about a change to either of the two centring diphthongs whereas consonant clusters caused the transformation to a long, more open monophthong.

Table 26:

Impact of class of post-/r/ consonant						
/o:/ > /ɔə/			/o:/ > /ɔ:/		/o:/ > /ʊə/	
Classes of post-/r/ consonants	abs.	%	abs.	%	abs.	%
Ø	3	43	2	29	2	29
voiceless stop		0	1	100		
voiced stop	1	33	2	66		
affricate			1	100		
nasal			2	100		

As regards the impact of post-/r/ consonants, the data exhibits a clear tendency for r-controlled Middle English /o:/ inputs to become /ɔ:/s in Modern English if they are followed by voiceless stops, affricates or nasals in their coda. Also two third of all words containing a voiced stop in their coda show the long, medium rounded, back vowel /ɔ:/ in their nucleus. Only those words that possess a final /r/ and no additional consonant in their coda are more likely to have an /ɔə/ sound.

Table 27:

Etymology						
/o:/ > /ɔə/			/o:/ > /ɔ:/		/o:/ > /ʊə/	
Origin	abs.	%	abs.	%	abs.	%
Romance	1	13	6	75	1	13
Germanic	3	50	2	33	1	17

An analysis of the etymological origin reveals that those words deriving from a Latin source largely contain an /ɔ:/ sound today while the majority of today's r-controlled /ɔə/ words have a Germanic root. It appears that /ʊə/ is the only sound not to derive from a preferred linguistic origin. Neither Germanic nor Romance roots seem to bear any significance for the shift to /ʊə/.

Table 28:

Onset of r-syllable (PoA)						
<i>/o:/ > /ɔə/</i>			<i>/o:/ > /ɔ:/</i>		<i>/o:/ > /ʊə/</i>	
Onset (PoA)	abs.	%	abs.	%	abs.	%
alveolar	1	33	2	66		
bilabial	2	25	4	50	2	25
Ø			2	100		
labiodental	1	100				

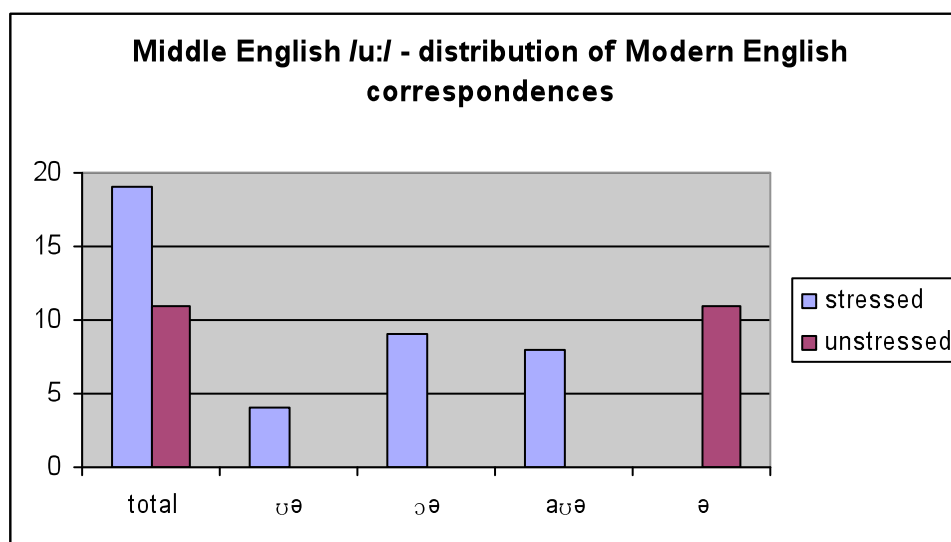
As a comparison with the previous tables shows, it is again the Modern English */ɔ:/* that shows the clearest preferences. This time it is the place of articulation of the syllable onset that is subject to investigation. It turns out that all words with no syllable onset shifted to */ɔ:/*. Likewise, the vast majority of words including an alveolar consonant in their onset changed in the same way as well. Labiodentals seem to have been the only onsets that triggered a change towards a different direction as they became */ɔə/* sounds in Modern English. However it must be questioned whether the picture conveyed by this part of the study can actually be taken at its face value. The fact that we are dealing with a very limited amount of data seems to distort the picture of the various constraints and their impact on the vowels.

Syntactic category						
<i>/o:/ > /ɔə/</i>			<i>/o:/ > /ɔ:/</i>		<i>/o:/ > /ʊə/</i>	
word class	abs.	%	abs.	%	abs.	%
Noun	2	29	4	57	1	14
Verb	2	50	2	50		
Adjective			2	66	1	33

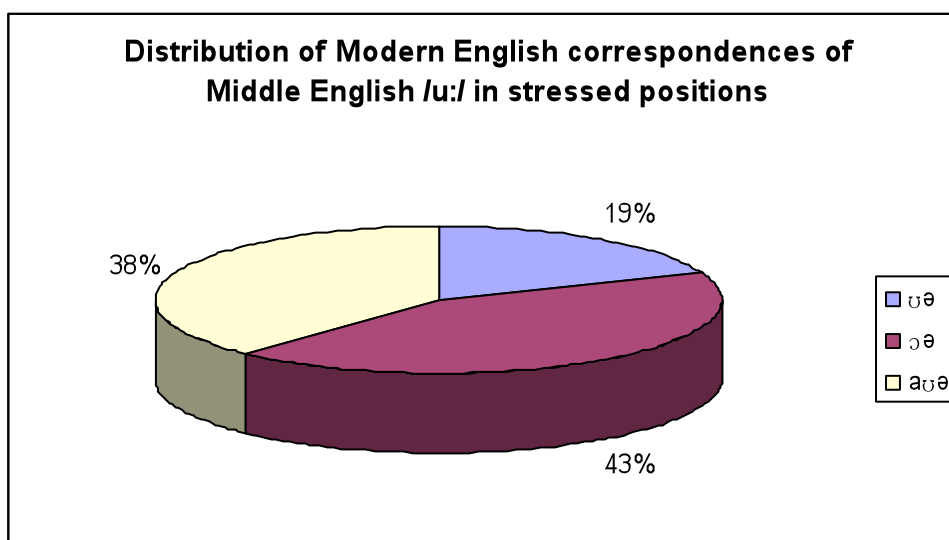
Once again, the */ɔ:/* proves to be the dominating Modern English output for all three syntactic categories. The difference in behaviour between nouns, verbs and adjectives turns out to lack in substance and shall therefore be neglected.

5.3.5 Analysing Middle English /u:/ and its Modern English correspondences

At this point it needs to be mentioned that it was rather problematic to determine where exactly Middle English /u:/ surfaced because in some cases /u:/ might equally well have been French /y:/. Having said that, we work on the assumption that it was the Middle English /u:/-sound that appears in all input entries.



It can be seen from the diagram above that if a syllable carried an /r/ in its coda, Middle English /u:/ did not take a single course in stressed positions. Similar to the sounds analysed above, it also holds a number of different counterparts in Modern English. Aside from the change to /aʊə/, which would have been the expected outcome had the Great Vowel Shift been fully implemented, other instances occurred that show /ɔə/ and /ʊə/ nuclei today. At the same time vowels of unstressed positions followed the usual pattern of development as they were reduced to schwa sounds.



The pie chart reveals that it was almost equally likely for /ɔə/ and /aʊə/-sounds to be the Modern English outputs in r-controlled contexts. Only the /ʊə/ sound was a less common output.

Impact of cluster vs. single consonant		
All types of changes	abs.	%
Single /r/	16	76
Cluster (rC)	5	24
Change /u:/ > /ɔə/	9	43
Single /r/	4	25
Cluster (rC)	5	100
Change /u:/ > /aʊə/	8	38
Single /r/	8	50
Cluster (rC)	0	
Change /u:/ > /ʊə/	4	19
Single consonant	4	25
Cluster (rC)	0	

According to the table, the data comprises about three times as many r-final words than words holding a cluster in their coda. On the one hand a shift to /ʊə/ and /aʊə/ exclusively took place in the context of r-final syllables and on the other hand the change to /ɔə/ preferably occurred if the vowel was followed by a cluster. Yet, there was still a probability of 44% for Middle English /u:/ to change

into /ɔə/ in the context of final /r/. Clear preferences can therefore not be detected.

It appears that the parameter ‘coda cluster vs. single /r/’ is not revealing at all.

Impact of class of post-/r/ consonant						
/u:/ > /ɔə/			/u:/ > /aʊə/		/u:/ > /ʊə/	
Classes of post-/r/ consonants	abs. 9	% 43	abs. 8	% 38	abs. 4	% 19
Ø	4	25	8	50	4	25
voiceless fricative	2	100				
liquid	1	100				
nasal	2	100				

Words with no post /r/-consonant were twice as likely to have an /aʊə/-sound in Modern English than to have an /ɔə/ or /ʊə/ sound. This partly correlates with what has been said about the influence of single consonants vs. consonant clusters (see above).

If a word held a voiceless fricative, a liquid or a nasal consonant in its coda it unexceptionably shifted to /ɔə/.

Etymology						
/u:/ > /ɔə/			/u:/ > /aʊə/		/u:/ > /ʊə/	
Origin	abs.	%	abs.	%	abs.	%
Romance	4	44	4	50	4	100
Germanic	5	56	4	50	0	

From the table it can be concluded that a shift to /ɔə/ was slightly more preferred if the word had a Germanic root. For the shift to /aʊə/ no preferences with regard to the etymological background of the word can be stated. Yet if the vowel changed to /ʊə/ only words stemming from a Latin root were involved.

Onset of r-syllable (PoA)						
/u:/ >/ɔə/			/u:/ >/aʊə/		/u:/ >/ʊə/	
Onset (PoA)	abs.	%	abs.	%	abs.	%
alveolar	1	25	4	50	1	25
bilabial	2	66	1	33		
velar	1	50	1	50		
palatal	2	50			2	50
glottal	1	100				
palato-alveolar	2	50	1	25	1	25
Ø			1	100		

The table shows that in the context of alveolar onsets /aʊə/ seems to have been the preferred output while only every fourth affected word incorporates an /ɔə/ or /ʊə/-sound respectively. Bilabial onsets preferably brought about /ɔə/ sounds. A shift to /ɔə/ and /aʊə/ nuclei was equally likely if preceded by a velar consonant. Also palatal onsets seem to have had an equal potential for triggering the shift to /ɔə/ and /ʊə/. In case a glottal consonant manifests itself in an onset position, the change to /ɔə/ came about to 100%. With a likelihood of 50% palato-alveolar onsets preferably caused a change to /ɔə/. Yet there is also a good chance for syllables with palato-alveolar onsets to have an /aʊə/ or /ʊə/ in their Modern English nuclei. In case no onset surfaced /aʊə/ appears to be the preferred Modern English nucleus.

Syntactic category						
/u:/ >/ɔə/			/u:/ >/aʊə/		/u:/ >/ʊə/	
Word class	abs.	%	abs.	%	abs.	%
Noun	5	45	5	45	1	9
Verb	1	25	1	25	2	50
Adjective	1	25	2	50	1	25
Pronoun	2	100				

With regard to syntactic category it turns out that there was no preferred output among nouns. The table shows that /ɔə/ and /aʊə/-sounds were equally likely to emerge in substantives. Only /ʊə/-sounds can hardly be found in this syntactic category. The reverse is true for verbs. Here, /ʊə/ seems to have been the most

preferred Modern English counterpart. Statistically speaking, every second adjective turned into an /aʊə/-sound in the context of postvocalic /r/ and pronouns are entirely connected to /ɔə/-sounds today.

5.3.6 Conclusion

At first glance the data gives the impression that the class of r-controlled words is very heterogeneous indeed. It appears that factors accounting for a change in a certain direction can therefore not easily be found. At the same time however, there are a few phonological factors that seem to constrain the processes behind ‘r-Wirkungen’ as will become apparent in the following summary of observations.

The results of 5.3.1 show that the transition to the lesser preferred /ɔ:/ exclusively depends on the type of onset preceding the nucleus. The change exclusively takes place in the context of the labio-velar approximant /w/. Therefore the expected statistical tendencies do not materialize.

In 5.3.2 the chance that ME /e/ becomes ModE /a:/ is greater in words with /r/-final codas than clusters. Similarly, the implementation of ModE /a:/ seems to be more likely with words of Germanic origin.

In 5.3.3 it is the coda constellation that has a great impact on the probability for /eə/ to appear in this context. As for this sound, the probability to occur increases if followed by a single-/r/ coda. At the same time, the chance for /ɜ:/ to occur in this context is practically nil. A change from /ɛ:/ to /ɪə/ is greatly influenced by both etymology and the type of onset. There is, therefore, good reason to assume that these two factors are correlated since words with Germanic origin as well as words with alveolar and labio-dental onsets preferably possess an /ɪə/-sound in their nucleus.

In 5.3.4 the chance that ME /o:/ becomes ModE /ɔə/ is greater in words with /r/-final codas than clusters. In the same way, words that possess a Germanic origin

preferably exhibit an /ɔə/ in their onsets today. As for the onset, the chance that /o:/ becomes /ɔə/ is higher in words with labio-dental onsets, whereas a change to /ɔ:/ was most likely with alveolar, labial and zero onsets.

In 5.3.5 a transition from /u:/ to /aʊə/ is more likely in syllables with an /r/-final coda, whereas /ɔə/ is preferred with coda-clusters. As regards etymological origin, the chance that /u:/ becomes /ʊə/ is higher in words with a Latin root whereas /ɔə/ is more likely with Germanic items. With respect to the constraint onset it can be demonstrated that the probability for /u:/ to change to /aʊə/ is greater in words with alveolar, zero or velar onsets. Yet, the chance for a manifestation of /ɔə/ is higher in words with bilabial, glottal or palato-aveolar onset. Finally, the chance that /u:/ becomes /ʊə/ is greater in palatal onsets. Thus, similarities to 5.3.3. can be observed.

6 Conclusion

According to the concepts and arguments presented, we may consider the historical development of /r/ as highly dynamic and multi-layered.

On the basis of a general sound description it can be deduced that the group of /r/-sounds is phonetically extremely heterogeneous. Since most rhotic types seem to undergo similar processes diachronically they are said to have a “family resemblance”. There is also good reason to assume that the various /r/-allophones ultimately stem from one common source which allowed us to take /r/-fullness as the starting point of the study, irrespective of its precise late Middle English/Early Modern English allophonic representation.

In the present thesis we have made the case that there was once a “historical /r/” which was present in both onset and coda positions of a syllable but became restricted to initial and intervocalic positions in some English dialects. It is a peculiarity of /r/ that the sound was not only subject to deletion but also shows instances of insertion in certain phonotactic contexts. We therefore come to the conclusion that the disappearance of /r/ must be regarded as a context-sensitive process.

By investigating the nature of /r/-insertion, that is linking and intrusive /r/, it could be demonstrated that /r/ has continued to be subject to change. To be more precise a “rule inversion” occurred whereby /r/ and Ø changed places. Generally speaking the rule implies that if a process operates before vowels it does not happen before consonants and pauses, and vice versa.

The theory of “Natural Phonology” provided us with a useful insight on how and why the changes occurred the way they did. The theory determined that both loss of /r/ and /r/-epenthesis must be regarded as “natural phonological processes”, meaning that the new forms are mental substitutions of phonetically difficult elements for easier ones. Essentially, these substitution processes are phonetically motivated and primarily contribute to an ease of articulation. Thus, loss of /r/ falls into the category of a speaker-friendly backgrounding process or so-called lenition process.

A number of sources have been quoted that classify the disappearance of /r/ as a natural backgrounding process. In addition to that factors determining that /r/-lenition is in accordance with the natural preference for a weak coda, have been scrutinized. Accordingly, coda-/r/ was subject to weakening because it shows to be both inherently and positionally weak.

Apart from language internal, physically and structurally determined parameters, r-lenition was also conditioned by external factors. Therefore, we have taken into account that the diffusion of an innovation is also socially conditioned. It has been claimed that r-less speech was initiated in low register and fast speech, which is generally typical of lenition processes. We also found evidence for labelling the innovation as a “change from below”.

The theory of NP also reveals that linking and intrusive /r/ emerge because speaker hears the vocalized forms but perceives /r/'s. Thus it may be inferred that language users undo the lenition process and arrive at underlying /r/'s. The survey, which was an attempt at replication Luick's findings on r-Wirkungen, showed that some of the established sound laws cannot be regarded as universally valid. The data revealed a number of exceptions and therefore the concept of Neogrammarian sound laws cannot be upheld. Instead the incorporation of statistical laws was advocated. A number of linguistic parameters were analysed in order to show if they constrained the development of exceptions. Although factors accounting for a change in a certain direction are relatively rare, the results of the survey indicate that a few phonological factors conditioned the emergence of exceptions.

Even though it is generally assumed that the system of English consonants is more “steadfast” than the system of English vowels (Brunner 1960: 229 quoted in Lutz 1994:168), the consonant /r/ can look back on an eventful past. The /r/-sound did not only undergo several changes but also caused the emergence of innovations, thus we may say that John Walker (1791 cited in Harris 1994:230) was surely not wide of the mark when referring to /r/ as “the most imperfect of all the consonants”.

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Appendix

A CD-Rom has been included in this book to provide readers with the data collected for the survey conducted in chapter 5.

Curriculum Vitae

NAME: Marlena Jaklin
NATIONALITY: Austrian
DATE OF BIRTH: 4th May, 1983

Education:

2001 – present: **University of Vienna**
Undergraduate MA student of English Literature and
Linguistics and Geography
1997 – 2001: secondary academic school Birkfeld
1993 - 1997: lower secondary school Birkfeld
1989 – 1993: primary school Fischbach

Further Education:

- 2007: *CerTESP – Certificate in Teaching English for Specific Purposes*
- October 2007-May 2008: German language assistant *William Ellis School* London
- April 2008: Presentation at a conference for primary and secondary teachers on the KS2 Framework for Languages in London *Borough of Camden*

Abstract

Gegenstand der Arbeit ist die historisch-diachrone Analyse der Entwicklung des /r/-Lauts seit dem Spätmittel- bzw. Frühneuenglischen.

In bestimmten Varietäten des Englischen wie zum Beispiel dem RP (Received Pronunciation), zeigt sich, dass sie heute zu den „non-rhotic accents“ gehören. So wird der /r/-Laut gegenwärtig lediglich vor Vokalen ausgesprochen (vgl. *red* [red], *very* [ˈveri], aber *card* [ca:d], *car* [ca:]). Auf Grund der orthographischen Präsenz von <r> vor Konsonanten oder Pausen kann jedoch geschlossen werden, dass /r/ in der Vergangenheit auch in diesen Positionen phonetisch präsent war.

Die diachrone Beschreibung gibt einen Überblick über den graduellen Verlauf des /r/-Schwundes, der unter anderem durch orthoepische Evidenzquellen belegt wird. Weiters werden die beiden Phänomene der /r/-Epenthese („linking /r/“ und „intrusive /r/“) hinsichtlich ihrer Entstehung und Verwendung erläutert.

Eine zentrale Frage der Arbeit betrifft die Motivation konsonantischer Lenierungen mit spezieller Bezugnahme auf den /r/-Laut in der Silbencoda. Dieser Frage wird Mittels der Theorie der natürlichen Phonologie nachgegangen.

Ein weiterer Kernpunkt der Arbeit betrifft die Frage inwieweit das /r/ in der Coda vorangehende Vokale beeinflusst hat. Um dies zu untersuchen wurde ein Set an Daten und linguistischen Parameter analysiert um in Folge Übereinstimmungen und Gesetzmäßigkeiten hinsichtlich der vokalischen Entwicklung erkennen zu können.