

THE EVOLUTION OF FRENCH R:  
A PHONOLOGICAL PERSPECTIVE

by

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## ABSTRACT

One of the most frequently-realized consonants in modern French, **r** is nevertheless one of the last sounds to be acquired by a child and often the only consonant never properly mastered by learners of French as a second language. The evolution of French **r** shows, on the one hand, prolonged resistance to global sound changes and, on the other hand, extensive and repeated sporadic variation with a relatively large number of other sounds in the language. We believe that it is this paradoxical behaviour of **r** which has led to the frequent, and in our opinion, incorrect description of the sound as being "unstable". Recent developments, particularly in the area of non-linear phonology, have enabled us to focus specifically on the intrinsic nature of French **r** to account for its unique behaviour.

In Chapter One we begin with a clarification of the terminology used in previous studies on French **r**, followed by a brief discussion of the **r**-sound in Indo-European. Lastly, an overview of some general phonetic aspects of contemporary French **r** is presented.

In Chapter 2 we examine the diachronic behaviour of **r**, presented in the following two main categories: 1) **r** is involved in global phonetic changes, including velarization from front **r** to back **r**, as well as the loss of **r** 2) **r** is found in sporadic variation with other sounds in the language, generally resulting from a variety of factors, linguistic or other.

Chapter 3 presents a re-examination of the **r**-processes discussed in Chapter 2 within the framework of dependency phonology (DP). Our focus in this presentation is on the issues of articulatory strength and phonological complexity, which constitute an important basis for the DP model. Of particular interest is **r**'s place on the hierarchical scale of articulatory strength and its degree of complexity as a liquid within the sound system of

French. By comparing the phoneme's articulatory strength and its level of complexity to that of the sounds **r** has behaved differently from or has alternated with, some reasonable explanations for the paradoxical behaviour of **r** can be established. The conclusion is drawn that French **r**, rather than being a phoneme of "instability", is in fact one of the most stable consonants in the language, precisely because of its flexible nature. The only overall trend that manifests itself when considering **r**'s evolution from Indo-European to modern French is that the liquid has become more consonantal, that is, stronger with respect to its articulatory components. Our examination of French **r**, therefore, belies predictions that the sound is weakening and in the process of disappearing.

erre con erre guitarra  
erre con erre carril  
que rápido ruedan las ruedas  
del ferrocarril

*(Spanish tongue twister)*

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## 1. Introduction

Despite considerable discussion about French **r** in the past, the study of the sound has not yet been exhausted, most likely because of its complex nature which has been made evident through its unique and often paradoxical linguistic behaviour. Referring to the **r**-sound in general, Wolff (1958, p.22) has appropriately stated, “[t]here is perhaps no other phoneme that admits of as many variations in place of articulation, manner of production, sonority and syllabicity, as **r**”. These varying realizations of **r**, found in the descendent languages of Indo-European, are still represented by the same written letter today and all belong to the family of **r**-sounds.

The wide range of **r**-variants is especially evident in the French language, where **r** has not only alternated with half a dozen other sounds during its evolution from Latin to modern French, but also manifested a unique behaviour in terms of consonant lenition. The “polymorphic” character of French **r** has led a number of linguists to describe this resonant as a phoneme of inherent instability, which is in the process of evolution or possibly even facing deletion. It should be noted that terms such as *stable*, *stability*, and *instability* are used here with specific reference to the notion of “permanence” or “endurance”, or the lack thereof, as defined in *Webster’s Ninth Collegiate Dictionary* (1988 ed.). Linguists describing French **r** as “unstable” seem to refer to the idea of something “diminishing” or “weakening” as opposed to the idea of something which is simply “vascillating”. Fleisch (1946, pp.68-69), for example, proposes three “hypothèses d’évolution” for apical **r** which will lead to the sound’s inevitable disappearance:

...r peut s’amuïr par le stade de z...r perdant ses battements et gardant son point d’articulation, tendra à devenir continu...r tend directement par

relâchement de l'articulation, à devenir une sorte de  $\theta$ , à s'amuir...

According to Borel-Maisonny (1942, p.231), "[l]e polymorphisme de l'r montre que cette consonne est instable et en voie d'évolution", while Charbonneau and Marchal (1979, p.303) simply describe French **r** as a phoneme "d'une grande instabilité". Hock (1986, pp128-129) appears to be the only one who equates the "instability" of a segment with nothing more than a greater level of phonetic "variation". He points out a number of issues manifesting **r**'s relative instability, noting for example that children master this sound during the last stages of first-language acquisition and that dissimilation and metathesis are very common with both **r** and **l**. According to Hock, other developments, such as the substitution of uvular **r** [ʀ] for apical **r** [r] or the alternation between the uvular trill [ʀ] and the uvular fricative [ʁ] as well as the alternation between the liquids [r] and [l] all attest to what he refers to as **r**'s "unstable" character.

Leaving aside the issue of semantics for now, it is our contention that the high level of variation is not an indication of instability (as interpreted by Fleisch, Borel-Maisonny, and Charbonneau and Marchal, above) but rather, that the flexible nature of **r** makes this resonant one of the most stable consonants in the French language. The purpose of this study is to examine the types of sound changes or processes French **r** has undergone during the course of its evolution from Latin to modern French, and to offer some possible reasons for the unique behaviour of **r**. In determining what role the resonant's inherent character has played in the historical variation of **r** we hope to show why the phoneme's polymorphic nature may better be described as *flexible* rather than as *unstable*.

Over the past four centuries French **r** has been the subject of extensive discussion.

ranging from the “bon usage” recommendations of seventeenth-century grammarians to a wide variety of scholarly articles accumulated during the past century. Diachronic studies of r-variation have been presented from the approach of historical and functional linguistics, as well as within the framework of articulatory and acoustic phonetics. In our presentation of the various processes in which r has been involved during the evolution of the French language, the historical facts will be presented in a manner which reflects the (traditional) approaches to the study of r encountered in our research.

Since, to our knowledge, no extensive studies of French r have been undertaken from a generative perspective, nor with the approach of some of the more recent non-linear models in the field of phonology, we have chosen to re-interpret the historical data within the recently-developed theoretical and notational framework of Dependency Phonology (DP). We will focus, in particular, on the notion of phonatory strength hierarchies and phonological complexity, two issues which form an important basis of the DP model and which lend themselves exceedingly well to an examination of consonant lenition and r-alternation. We hope that an analysis from this entirely different perspective will shed new light on some of the many unresolved problems regarding the evolution of French r, as well as offer some plausible explanations for the paradoxical behaviour of the phoneme.

Before proceeding with our examination of historical r-variation, we present an account of the terminology used in the literature dealing with French r in order to avoid some of the confusion due to the ambiguous use of terms and phonetic symbols found in previous studies. This is followed by a brief discussion of r in Indo-European as well as an introduction to some general phonetic aspects of contemporary French r.

## 1.1 Terminology

There has been considerable discussion as to the appropriate names for the various realizations of **r**. Generally, a term used to describe a particular **r** is based on the articulatory characteristics of that variant. Thus, an **r** pronounced in the front of the mouth is usually described with words such as *alveolar* or *dental*, which refer to the place of articulation, while *apical*, *lingual* or *tongue-tipped* indicate that the end part of the tongue is involved in the articulation of front **r**. Similarly, terms like *velar*, *uvular*, *palatal*, *guttural*, *pharyngal*, or *dorsal* are employed to designate **r** articulated in the back of the mouth. Some have argued that the term *uvular* is not appropriate, because in most instances the uvula remains inert during the articulation of back **r**. Borel-Maisonny (1942, p.221), however, suggests that the various characteristics of **r** are not at all determined by its point of articulation. According to her, it is the degree of contraction of the buccal cavity, the participation of the larynx or lack thereof, and the presence or absence of trilling which act as determining factors. Borel-Maisonny, therefore, has chosen the more general terms *guttural* or *posterior* to refer to the **r** articulated in the back of the mouth. Delattre (1969) argues that the different types of back **r** are all "sounds of the pharynx", as suggested by the title of his article "L'r parisien et d'autres sons du pharynx". He explains that back **r** primarily involves the movement of the root of the tongue towards the pharyngal wall, or more precisely, that it is the retraction of the tongue and the reduction of space in the pharyngal cavity which produce the sound of back **r**. The vibrations of the uvula are only secondary features and only the result of a stressed pronunciation. Therefore, *radico-pharyngal r* is the more appropriate term.

While the above arguments are founded on clear and justified explanations, the terms *r grasseyé*, *parler gras*, *grasseyer*, *grasseyement*, and *grasseyeur* are based on a purely subjective interpretation of the phoneme and have caused the greatest amount of confusion in the description of the articulatory and acoustic characteristics of *r*. The terms lack exact and clearly stated definitions which would allow them to be used uniformly without causing the misinterpretation and confusion evident in much of the literature dealing with the historical variation of *r*.

The various *gras*-terms were derived from the verb *grassier* of the seventeenth century, which at that time meant “to lisp” or not to pronounce *r* at all, according to Co:grave's dictionary of 1611<sup>1</sup>. The various derivations and forms of *grasseyer* have received a number of differing interpretations, often made to fit as supporting evidence for a particular theory on the linguistic change of *r*. Among the earliest, Trautmann (1880) for example, in an effort to prove that the term *parler gras*<sup>2</sup> is an indication of the first use of back *r* in French, translates it to the German term *Schnarren*, which corresponds to Littré's definition of *véritable grasseyement*, “une sorte de roulement guttural” (Littré, 1878, p.1921). Littré (loc. cit.) distinguishes the latter term from *grasseyement affecté*, explaining that this term “consiste à ne prononcer nullement la lettre *r*”, while the verb *grasseyer* means to either pronounce *r* “in a vicious manner” or to replace it with *l*. According to Trautmann (1880, p.216) it was the *Schnarren* or guttural pronunciation of *r* which gave the

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<sup>1</sup>as quoted in Wolff, 1958, p.9

<sup>2</sup>found in La Haye's *Voyage de M.M. Chapelle et Bachaumont*, 1742, p.40 (cited by Wolff, p.8)



speech of the *Précieuses* its affected nature. It could not be an **l**-pronunciation, he explains, because *Lallen* (as it is known in German) is a natural speech defect. Similarly, Hellier (1898, p.43) also recognizes *grassement* as being the pronunciation of **r** with the root of the tongue.

This same view is later reiterated by Haden (1955, p.206), who writes that *grassement*, as a translation of *Schnarren*, means “undoubtedly...to use uvular **r**”. Among others, Léon (1967, p.131) also uses the term “**r** uvulaire grassement”, while Straka and Nauton (1945, p.197) similarly explain that “**r** uvulaire vibrée” is also sometimes called “grassement”. More recently, Wollock (1982, p.198), in an effort to explain the origin of the term *parler gras*, mentions, that from an articulatory point of view, the “*fat* may also refer to the muscular expansion of the back of the tongue”. Delattre (1966, p.206), who focuses on acoustic aspects of *grassement*, points out that *r grassement* is another name for pharyngeal **r** since it is the pharyngeal resonance which gives the phoneme its character “gras”. Among earlier discussions, Eurén (1896, p.1) notes that the term refers to “l'impression qu'en reçoit l'oreille”. He elaborates on this definition, supporting Trautmann's theory by stating that “...surtout les *Précieuses*, sans doute pour donner plus de distinction à leur langage, et, par conséquent, avec intention, commençaient à grassement, c'est-à-dire à prononcer l'**r** uvulaire”. This definition conflicts, however, with Eurén's (ibid., p.11) later definition of *grassement*, when the term is attributed to the post-palatal *fricative* [ʁ], said to be replacing the trilled uvular **r** [R]. Millet (1926, p.19) also provides an acoustic perspective by noting that “*r grassement*...se distingue à l'oreille de ceux qui possèdent l'**r** traditionnelle [front or apical **r**] par un raclement plus ou moins dur et heurté. ...elle se distingue de **r** parisienne par son

épaisseur et ses saccades qui font quelquefois reprocher au sujet parlant de `causer la bouche pleine, ou en mangeant de la bouillie”’, and although he finds Littré’s (1878) definitions of the term *grasseyer* as insufficient and inexact, he continues to use the term in his work.

Contrary to Trautmann’s (1880) theory, Lancaster (1934, p.244) claims that “parler gras did not necessarily mean using uvular **r**” but rather “to speak as if one had something soft in the mouth” like a potato. He interprets the term as referring to affected speech, as in the 1665 comedy *L’Après-Soupe des Auberges* by Raymond Poisson. In this play, one of the female characters “affecte un certain parlé gras” (Lancaster, 1934, p.245) which includes the vocalization, fronting and de-palatalization of [r,k,g,ʃ,ʒ,s] to [l,d,s,z,z] respectively as well as the replacing of **r** with **l**.

While some have attempted to define the term *grasseyer*, others have merely accepted its meaning as being ambiguous and unclear. Among these is Jespersen (1889), who describes *parler gras* as an “indistinct” designation of affected speech not necessarily concerning **r**, and *grasseyer* as a rather vague term. Vinay (1949) chooses to avoid the use of it due to the imprecision of the term and Wolff (1958, p.10) correctly points out that “[i]n modern usage, the expression still has no fixed meaning”<sup>3</sup>. Nyrop (1902, p.48), who had also chosen to “abstain” from using the term *r grasseyé*, had summed up the debate most accurately by stating that any efforts to define the term precisely have only led to an amusing array of contradictions, leaving the term with very little scientific value. He offered this, his own definition, to demonstrate the biased meaning of the term:

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<sup>3</sup>*Le Petit Robert* dictionary (1990, p.886), for example, defines *grasseyer* as a pronunciation of **r** not involving the tongue, whereas *Harraps French-English Shorter Dictionary* (1991, p.377) defines it as an exaggeration of one’s **r**’s.

Grasseyer: Terme, généralement méprisant, qu'on applique à la prononciation d'autrui; les gens qui articulent l'r d'une certaine façon se servent de ce mot pour caractériser toute manière différente d'articuler la dite consonne.

Despite the number of contradictory definitions and the decision among many linguists to avoid the term altogether, *grasseyé* continues to be used even into the 1990's<sup>4 5</sup>.

In order to avoid the ambiguity and confusion found in the many articles dealing with the French **r**, usually caused by unexplained graphic symbols and terminology used to represent the **r**-variants, we offer the following phonetic guide and explanation of the terms employed in this dissertation. The following list of phonetic symbols for **r** is primarily based on the International Phonetic Alphabet (IPA) characters and diacritics as described by Pullum and Ladusaw (1986) in their *Phonetic Symbol Guide*.

#### 1.1) *Phonetic symbols of r-variants*

- [r] - voiced apico-alveolar trill
- [r̥] - voiced alveolar flap
- [r̄] - predorsal trill
- [r̥̄] - intermediate **r** between [z] and [r]
- [z] - voiced dental central fricative
- [ð] - interdental fricative
- [R] - voiced uvular trill
- [ʁ] - voiced uvular fricative
- [χ] - voiceless uvular fricative
- [ʁ̥] - whispered fricative **r**

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<sup>4</sup>In his 1992 study on **r** in Tunisian French, for example, Skik writes “- une prononciation uvulaire (R “grasséyé” [sic] )”.

<sup>5</sup>One final point may be made with respect to our own interpretation of the term. Our first encounter with *parler gras* and *grasseyé* led us to believe that it referred to front **r**, perhaps due to our own Germanic linguistic background. The description of any **r**-variant as “fatty” seems more appropriate for apical **r**, since uvular back **r**, in our opinion, is characterized by a rather dry and raspy sound and feel. There is, therefore, little value in metaphorically-based descriptions of sounds when a clear and objective articulatory explanation is available and much more useful.

[Ø<sup>h</sup>] - breathy trace of lost **r**

[Ø] - absent **r**

**r** - the phoneme **r**

> - indicates diachronic change

In our dissertation we will be using the terminology and phonetic descriptions found within the framework of articulatory and acoustic phonetics in order to provide an exact representation of each **r**-variant. The orthographic symbol “**r**” is used when referring to the phoneme **r** in a general context. Apical variants of **r** are termed as “front **r**” and represented by an italicized *r*. For guttural **r**'s the term “back **r**” and the symbol *R* will be used. The most frequently realized French **r**-variants, which include front trilled or flapped **r** and the uvular trilled or fricative **r**, will be referred to as *principal r-variants*. Finally, the terms *r-variation* and *r-alternation* need clarification. The former refers to any process that has resulted in a modification of **r**, the latter is limited to those processes involving a change (often bi-directional) between **r** and another phoneme.

## 1.2 Indo-European **r**

The following presentation of Indo-European **r** is based on the works of Brugmann (1904), Meillet (1964), Porzig (1954), and Schrijnen (1921), who provide an insight into the realization of **r** and the consonant's functional value in Indo-European. In the various works consulted, **r** is most often discussed with the other liquid **l** and grouped together with the resonants, which include the nasals /**m**, **n**/ and the semi-consonants /**w**, **j**/. These phonemes all occupied an intermediate position between consonants and vowels in Indo-European in that they shared some of the resonating qualities of the vowels while their articulatory

movement resembled that of the consonants (Meillet, 1964, p.107). Due to this combination of both vocalic and consonantal traits, Indo-European **r**, like the other resonants, was able to function as either a vowel or a consonant. With respect to the first, it is noted specifically that **r** could become vocalic/syllabic in a non-stressed syllable, that is, when it was adjacent to an atonic vowel. However, according to Brugmann (1904, p.121-2), it is not clear to what extent **r** or any of the other resonants became vowels and whether they replaced the neighbouring atonic vowel completely in this context. Traces of the vowel were often evident in the written texts, demonstrated by the following representations of vocalic **r**: <sup>◌</sup>r, <sub>◌</sub>r, <sup>◌</sup>◌r, ◌◌r, ěr, r. When functioning as a vowel, **r** appeared in prevocalic and interconsonantal position and initially before a consonant. Furthermore, vocalic **r** could also be found as the second part of a diphthong, that is, preceded by another vowel and followed by a consonant. Schrijnen (1921, p.266) notes that vocalic **r** also appeared as the first part of a diphthong and was thus equivalent to /i/ and /u/ in Indo-European. As a consonant, **r** was found in initial, prevocalic, intervocalic, and postconsonantal / prevocalic position, as well as before another resonant.

As Indo-European evolved, this two-sided function of **r** was only preserved in Sanskrit and only limited to short vocalic **r** in preconsonantal position, while long vocalic **r** was completely lost (Meillet, 1964, p.125; Schrijnen, 1921, p.261; Brugmann, 1904, p.131). In all other Indo-European languages, **r** has lost its value as a long or short vowel, having become increasingly consonantal in character along with the other resonants /l/, /m/, /n/ (Meillet, 1964, p.125). Both Brugmann (1904, p.122) and Porzig (1954, p.66) mention, however, that traces of this vocalic **r** in Indo-European are manifested in the various tones of

vowels found in the languages that have evolved from Indo-European. In the case of the Italic languages, Porzig speaks of a dark “colouring” or tone represented by [o]<sup>6</sup> while Brugmann identifies traces of vocalic **r** with a consideration of its linguistic context:

1.2) *Traces of vocalic Indo-European r*

$\text{r} / \_ \text{t} > \text{or}$   
 $\text{r} / \_ \text{i} > \text{or}$   
 $\text{rr} / \_ \text{a} > \text{ar}$   
 $\text{r} > \text{rā} (\text{ar})$

Although this multi-dimensional character of Indo-European **r** concerns the functional value of the phoneme, it does give some indication about the phonetic traits of **r** at that time, since a certain amount of vocality or resonance is needed to allow a consonant to function as the centre of a syllable.

With respect to the realization of Indo-European **r**, the sound is described as a dental, characterized by a trilling of the apex which is held throughout the emission of the sound (Schrijnen, 1921, p.261; Meillet, 1964, p.105). According to the testimony of grammarians, this dental trill passed into Latin, where it is often referred to as a “Zungenspitzen **r**” or apical **r** (Schrijnen, 1921, p.263). The resonant subsequently entered the French language, also as a trilled front **r**, undergoing significant transformation in late Old French and Middle French, until it was permanently replaced by back **r** in the seventeenth century.

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<sup>6</sup>“In den einzelnen Sprachen kommen nun als Vertretung silbischer Liquiden folgende Färbungen wirklich vor:...dunkle Farbe im Lateinischen, Oskisch-Umbrischen, Venetischen, Illyrischen und Germanischen, in einigen Fällen auch im Baltischen und Slavischen; für das Germanische pfllegt man u anzusetzen, o ist aber genauso möglich; die anderen haben o”.

### 1.3 Contemporary French r

At the end of the last century, Bell (1896) presented a comprehensive overview of the various articulations of the phoneme **r** in his monograph entitled “The Sounds of R”. The fourteen varieties of **r** include glottal, guttural, palatal, lingual and labial articulatory descriptions of **r**. Of these, Bell only considered two *guttural* articulations, “Parisian **r**” ([ʁ]) and “French **r** grasseyé” ([ʁ̃]), as representative of French **r**, influenced as he was by the then frequently-found prescriptive attitude in language description. Thus, Bell not only disregarded the apical trill and flap as part of the French sound system, two variants on his list which are still commonly found in many French-speaking regions around the world, but also excluded two other types of what he calls “lingual” **r**’s, which have also been found in francophone communities. For example, the first type of lingual **r**, described by Bell as a “modification” due to “guttural friction” which results in a *double articulation* of **r**, has also been observed in a recent study of Montreal French by Santerre (1982). The second type of lingual **r** described by Bell as “modification” due to a “rounding of the lips”, is mentioned by Taylor (1952) in his description of **r** in Dominican Creole.

Our own overview of the physical and acoustic traits of French **r** represents a general description of the principal **r**-variants in the language, including both categories of front **r** (*r*) and back **r** (*R*). The front **r**-variant, most frequently called an apical or alveolar **r**, is produced when the tip of the tongue vibrates against the upper front part of the mouth, anywhere between the upper front teeth and the alveolar ridge. It is the passage of air that causes the tongue tip to vibrate, producing either only one beat, called a flap [ɾ], or several beats, referred to as a trill [r̄], depending on the force of the air and the flexibility of the apex

(Wolff, 1958, p.24). The tongue itself is slightly retracted, the back of the tongue resting in about the same position as for the vowel [ɔ] (Tousignant, 1987c, p.40), and there is usually no involvement of the lips in the realization of this variant (Grammont, 1965, p.73). Many linguists do not regard the trilling or flapping movement of the tongue's apex as an occlusion, and the front r-variants are therefore considered to be continuous consonants or, according to Wolff (1958, p.23), described as *intermittent*.<sup>7</sup>

In the case of back r, the lips and lower jaw are held in the same way as for front r. However, the tip of the tongue is lowered and placed against the lower incisors while the sides of the tongue are in contact with the rest of the lower teeth. During the realization of a trilled back r [ʀ], the back part of the tongue is raised towards the soft palate in front of the uvula. The air stream passing through the buccal cavity causes the uvula to vibrate against the tongue, the uvula in this case serving the same function as does the tip of the tongue in the realization of front r. Grammont (1965, p.73) notes that "cette projection de la luvette sur

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<sup>7</sup>The feature of continuancy in the manner of articulation of sounds appears to be a matter of considerable dispute, especially with regard to the nasal consonants and trills. While Chomsky and Halle (1968, pp.317-318) attribute the feature [+continuant] to all varieties of r, the nasal plosives are considered to be [-continuant], the feature of non-continuancy being based on the criterion that "the air flow through the mouth is effectively blocked". The latter category therefore also includes oral plosives, affricates, glottal stops, and other types of implosive and ejective stops. A. Brakel, however, another generative phonologist, views nasal consonants as being [+cont] while he considers the apical flap to be [-cont] (*Phonological Markedness and Distinctive Features*, 1983, Bloomington: Indiana University Press, pp.22-23). This view, regarding [r] as non-continuant, is also shared by C.J. Ewen (1977, p.315). General reference sources also do not offer a clarification of the issue: *An Encyclopedic Dictionary of Language and Languages* (1992, p.82) vaguely defines continuants as sounds "made with an incomplete closure of the vocal tract", such as stops. The Larousse *Dictionnaire de linguistique et des sciences du langage* (1994, p.116) claims that all sounds, including nasal and lateral consonants, are continuants except for plosives, affricates and *trills*. Our own opinion as to the continuancy feature for trills is that they are [+cont] because without a continuous egressive air flow the tongue tip or uvula could not be put into a vibrating motion.



le dos de la langue n'empêche pas le voile du palais d'être relevé et d'occluser l'entrée postérieure des fosses nasales". The vibrations of this **r** are relatively evenly spaced, yet weaker than those of front trilled **r** because the uvula and the back of the tongue offer more flexibility than do the alveolar region and the tip of the tongue. As is the case with front **r**, the position of the back of the tongue is similar to that in the articulation of [ɔ] (Tousignant, 1987c, p.38). When there are no vibrations in the articulation of back **r**, a uvular fricative [ʁ] is realized. The back of the tongue is in exactly the same position as for trilled back **r**, while the uvula, however, "instead of curling forward in the medial groove of the dorsum of the tongue...lies in this depression with its tip pointing towards the pharynx" and consequently cannot be lifted easily by the air stream. The uvula therefore remains immobile as the air passes through the buccal cavity and only helps to produce "a fricative noise" (Wolff, 1958, p.29). It has been suggested that for fricative back **r** the tongue is not retracted as in the case of trilled back **r** (Tousignant, 1987c, p.38), or that the back of the tongue is raised slightly more for the fricative **r**-sound. Concluding from our own observations, we find that it is merely the type of movement of the uvula which distinguishes the trilled back **r** from the fricative back **r** and that any raising or retracting of the tongue depends on the nature of the neighbouring vowel. It is, therefore, not incorrect for Straka (1979, p.498) to claim that "dans les deux cas [of [ʀ] and [ʁ]], la luvette elle-même participe à l'articulation, de sorte qu'on peut les appeler tous les deux tout aussi bien uvulaires", the "participating" of the the uvula not necessarily suggesting the production of vibrations but rather designation of the place of articulation and contact of this organ with the tongue.

With regards to the acoustic aspects of **r**, Wolff (1958, p.37) gives the best general overview with the following summary:

...[I]t appears that all of the phones of the **r**-family have certain acoustic features in common. Both back **r**'s and front **r**'s may be synthesized with two formant patterns containing a straight first formant, and a second formant with a slow and large minus transition<sup>8</sup>. Both have the same F1 frequency of transitions, the same F1 frequency of trills, the same F2 duration of transitions, the same duration of closure, the same rate of interruptions in the trills of F1 and F2. The only difference is that the F2 transition of back **r**'s begin[s] in a low frequency range, while that of front **r**'s starts in a high frequency range.

She adds that although a third formant is not necessary to distinguish back **r** from front **r**, the F3 may be somewhat lower for the front variant (1958, p.37). As Wolff rightly concludes, despite the differing places and modes of articulation, the acoustic characteristics of back and front **r**'s justify their being grouped together to phonetically represent the letter **r** in French.

This overview of French **r**, though brief, touches upon the various issues which will be discussed in the following two chapters. The dual function of Indo-European **r** as vowel and consonant gives an idea of the complex nature of the resonant. The description of contemporary French **r**-variants not only demonstrates the variety of characterizations **r** evokes, but also reflects the range of variation this sound itself presents.

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<sup>8</sup>A "transition" is a frequency shift; in the case of **r** it is termed as "minus" because the frequency position of the second formant begins at a lower state and then slowly rises to reach its steady state (Wolff, p.34).

## 2. Historical Variation of French r

The diachronic phonological processes affecting French r throughout the evolution from early Romance to modern French have occurred in a variety of ways. First, French r has undergone a permanent change involving a modification of its place of articulation - front r, the Latin and Romance pronunciation, has become back r in contemporary universal (or standard) French. In addition, the resonant has been lost in various phonological contexts. At times this loss has been permanent, but more often r has been lost only temporarily, to be restored at a later date. Finally, r has alternated with other phonemes in the French language, either by *permanently* replacing or being replaced by another phoneme, or by *temporarily* alternating with a similarly articulated phoneme. These developments (velarization, loss, and alternation) may be grouped into three different categories of sound modification: 1) the change from front r to back r represents an *isolative*<sup>1</sup> change, i.e., one that occurs independently of linguistic conditions; 2) loss of r is part of a “wholesale modification of consonants”<sup>2</sup> due to a general sound change in the language 3) r- alternation with other phonemes constitutes *sporadic*<sup>3</sup> sound change, changes which occur irregularly and may be conditioned by particular phonetic factors.

The following discussion presents an examination of the various sound changes or processes which r has undergone, extending from the pre-Romance period to twentieth-century French. The data is summarized in the form of a time-line illustration which

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<sup>1</sup>Pope, 1934, p. 61; Price, 1971, pp.30-31; Ewert, 1970, p.25

<sup>2</sup>Pope, 1934, p. 69

<sup>3</sup>Hock (1986, p.35) uses this term to describe processes such as dissimilation and metathesis, specifically dissimilation of r...r > r...l and metathesis of r...l > l...r.

presents the *r*-processes within their various linguistic contexts. The purpose of this analysis is to provide a clear overview and understanding of the complexity and unique behaviour of *r* throughout its evolution.

## **2.1 Global Change Involving French *r***

Two of the most widely discussed phonetic changes which French *r* has undergone include the loss of *r* and velarization of trilled front *r* to uvular *r*. Both *r*-deletion and the velarization of *r* may be considered as “global” changes: the former, because it occurred as part of a general sound change which affected not only the resonant but all consonants within the language during Old and Middle French; the latter, because this process affected *r* in all positions and phonetic contexts. We begin our discussion with the change from *r* to *R*, the only *r*-process constituting a modification which has resulted in a permanent change during *r*'s evolution from Latin to modern French.

### **2.1.1 *r* > *R***

During its evolution in the French language, the most significant change the *r*-phoneme has undergone is its transfer from a front articulation to a guttural realization. The exact date at which *r* was first pronounced in the back of the mouth as well as the reasons for this change are greatly disputed. Based on the secondary sources consulted here<sup>4</sup>, what is certain is that the back *r*-variant became an acceptable pronunciation in French by the end of the seventeenth or the beginning of the eighteenth century. By the end

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<sup>4</sup>Trautmann, 1880, p.212; Pope, 1934, p.56; Nyrop, 1935, p.362

of the nineteenth century, *R* was the dominant pronunciation in the northern and central regions of France, especially in Paris and the larger cities. Front *r* persisted as the principal variant in the south of France and in the rural areas as well as in smaller cities across France (Meyer, 1875. p.185; Eurén, 1896. p.9)<sup>5</sup>.

Numerous linguists have attempted to prove that a back *r*-variant existed prior to Middle French, the most recent claims dating uvular *r* back many centuries. Thurot (1881-83, p.270) suggested that in the sixteenth century *r* already had a guttural realization, specifically in initial position. He based this belief on the testimony of grammarians who at that time claimed *r* to be articulated “strongly” at the beginning of a word. Lancaster (1934, p.246-7) finds proof of a uvular realization of *r* in Raymond Poisson’s 1665 play, *L’Après-Soupe des Auberges*. The playwright includes an alternate spelling of *grands* and *gras* as “gueans” and “guea” in order to demonstrate the affected speech of one of the characters. According to Lancaster, the only possible explanation for this written *u* is that it indicates a guttural realization of *r*<sup>6</sup>. Giauque (1975, p.408) makes mention of a much earlier existence of back *r*, dating to the beginning of the fourteenth century, based on a description found in Jean de Joinville’s work of 1309: “...li *rendres* escorchait la gorge par les *erres*...”. Another article, by Falc’hun (1972), discusses an even earlier occurrence of uvular *r*. Falc’hun

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<sup>5</sup>It was observed by Passy (as quoted in Eurén, 1896, p.10) that at the 1887 Congrès d’Instituteurs, which was attended by 2400 school teachers from regions across the country, seventy-five percent of those who spoke publicly still pronounced the front *r*-variant.

<sup>6</sup> “He could not have meant it to have the value of *é* or of any other vowel, for in that case the last line quoted would have fifteen syllables. If he had meant that *r* was dropped, he would have written *gas*, just as he wrote *paler* for *parler*. If he had wished to indicate a glide [j], he would have written *guias*, as he wrote *siege*, *soutient*. If by *gueas*, he had meant [gwɑ], he would have written *gouas*, just as his contemporaries wrote *Jouan*.” (Lancaster, 1934, p.247)

suggests that the alternation of **r** with **h**, which can be dated to the Gallo-Roman period, is evidence of a possible guttural realization of **r** even before the beginnings of the French language.

Wolff (1958), in an extensive discussion of French **r**, also demonstrates that a guttural pronunciation of the phoneme may be dated back at least to Old French, depending on **r**'s position in the word. Wolff (1958, p.5) alludes to O. Ulbrich's<sup>7</sup> (1878) statement, (contradictory to Thurot's claim) that final **r** was "guttural" in Old French and "lingual" (apical) in initial position. Wolff (ibid., pp.62-64) supports Ulbrich's view by maintaining that, in preconsonantal position, **r** was pronounced gutturally, given the phoneme's alternation with velar **l** (e.g. *corpe* ~ *colpe*) and with retracted **s** [ʃ] (e.g. *marle* ~ *masle*), as well as with the back vowel **u**, (e.g. *arbre* ~ *aubre*).<sup>8</sup> Consequently, word-final **r** followed by a consonant-initial word was also realized at the back of the mouth. Final **r**, when followed by a pause, was also uvular, according to Andry's statement (made in 1689) that the people of Paris pronounce "les **r** à la fin des infinitifs...très mal et fort rudement"<sup>9</sup>. Conversely, Old and Middle French **r** was "apical" in intervocalic position and word-final

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<sup>7</sup> Ulbrich, O., (1878), "Ueber die vocalisirten Consonanten des Altfranzösischen", *Zeitschrift für romanische Philologie*, 2: p.544.

<sup>8</sup>As further proof, Wolff notes that in Old and Middle French, vowels were frequently retracted before preconsonantal **r** in northern France, for example [e] > [a] in *aparcevoir* < *apercevoir*, (ibid., p.65), [e] > [o] in *vortu* < *vertu* (ibid., p.69), and [a] > [ɑ] in *arme* < *âme* (ibid., p.71).

<sup>9</sup>Wollock (1982, p.212) interprets Andry's observations, including the latter's advice that "[i]l est bon de faire sonner un peu les **r**...mais il ne faut pas se régler sur le peuple de Paris, qui les prononce jusqu'à escorcher les oreilles..." as referring simply to a very intensely and loudly articulated front **r**. He claims that a more softly articulated front **r**, resembling an **l**, was the "high fashion" **r** at that time.

position when followed by a vowel-initial word. This front articulation of **r** is deduced from its intervocalic alternation with [z] and from examples of raised [a] to [e] before intervocalic **r**, e.g. *Peris* < *Paris* (ibid., p.60). Furthermore, the phoneme may also have had a front articulation in postconsonantal position, based on examples showing epenthesis of [ə] before **r** in words like *ouvrier* > *ouvière*, which puts **r** once again in an intervocalic context (ibid., p.61)<sup>10</sup>. As the more recent observations cited above show, the existence of a back **r**-variant may quite likely date back to a period prior to the one generally acknowledged as marking the beginnings of uvular **r**.

The manner in which the *r* > *R* process occurred has been discussed from various theoretical perspectives, including explanations which postulate both gradual sound change as well as sound substitution. With respect to the former, Straka's (1979) description of *r* > *R* provides the most detailed account of the process within the framework of articulatory phonetics. Straka suggests that the process occurred independently of **r**'s position in the word and attributes its origin to the attempted restoration of weakened or lost **r**. He claims that both the apex and the dorsum of the front part of the tongue were weakened and consequently lowered. In an effort to still pronounce **r**, the back of the tongue was raised to create the vibrations typically characterizing the phoneme **r**. Thus, while a front **r** was intended, only a back **r** was achieved as the trilling in the uvular region required less energy

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<sup>10</sup>Lozachmeur (1973), in his article entitled "Evolution de **r** et diérèse dans le groupe consonne + **r** + yod", suggests that the uvular pronunciation of **r** is the main cause for the insertion of schwa in a word like *ouvrier* < *ouvier*. He suggests that this process occurred because the new pronunciation of **r** in the back of the mouth rendered the consonant cluster C+ **r** + **j** "imprononçable". He claims that both the uvular realization of **r** and the insertion of **e** occurred in the seventeenth century.

than the vibrations produced with the tip of the tongue against the alveolar ridge. Rousselot (quoted in Haden, 1955, p.504)<sup>11</sup>, in an earlier and less complete description, also saw the change as resulting from a progressive weakening in the articulation of the phoneme.

A much earlier attempt at explaining the process was made by Jespersen (1889), whose description, however, lacks the support of empirical evidence<sup>12</sup>. According to Jespersen, due to a softening of the trill, *r* would have weakened to [z] or [ð] and finally become a guttural fricative when the back part of the tongue was raised. The front trilled *r*, which still co-existed with the new fricative variant, was mostly used for emphasis and in loud speech. The vibrations were finally restored to back *r*, resulting in the modern uvular trill. However, in a more recent and, as well, more plausible account, Delattre (1966) suggests that [r] first became [R] and only lost its trill in a second phase, resulting in [ʁ], a premise based on the “repeated observation of the substituting of trilled apical *r* by a fricative apical *r*, in Mexico”. This claim is supported by other studies undertaken in the last half century, not only in France but also in North America, which indicate that the fricative uvular variant is becoming increasingly popular among francophone speakers<sup>13</sup>.

Another type of explanation, which focuses on the reasons for the process, offers the view that the *r* > *R* change is a sound *substitution*<sup>14</sup> rather than a gradual change. The role of

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<sup>11</sup>Rousselot is quoted from: Dictionnaire de la prononciation française, *Revue de phonétique*, vols. 1-4, 1911-15, pp.174-175

<sup>12</sup>As Jespersen himself points out, he ventured “...to set forth without any learned apparatus...” his theories on this issue (Jespersen, 1889, p.73).

<sup>13</sup>see Borel-Maisonny (1942), Cedergren (1985), Delattre (1969), Léon (1967), Santerre (1979), Straka & Nauton (1945), Tousignant (1987a,b, 1989), Vinay (1950), Wolff (1958).

<sup>14</sup>Pope, 1934, p.67.



the process is considered within the context of the French consonant system and therefore represents a functional perspective. Haden (1955) claims that the change from front **r** to back **r** constitutes a spontaneous substitution, brought about to end the confusion between *r* and its assibilated variants. Among the structuralists, Martinet (1962) deems the simplification of geminated **r** to be the main reason for the change, a claim more recently supported by Reighard (1985). Martinet suggests that when double **r** was reduced to sound like simple **r** in intervocalic position, former **rr** (or strong **r**) took on the guttural vibrations while etymological simple **r** (or weak **r**) was pronounced apically. The distinction between front **r** and back **r** was finally neutralised, with *R* being left as the dominant pronunciation. Lozachmeur (1976) offers an explanation similar to Martinet's, except that according to the former, etymological geminated **r** was opposed to assibilated simple **r** in intervocalic position before being replaced by the guttural variant. The opposition was subsequently neutralised and intervocalic assibilated **r** was replaced by back **r**, which subsequently spread to the other positions occupied by **r**. Thus Lozachmeur agrees with Haden in considering the assibilation process of **r** as a cause for *r* > *R*. Wolff (1958, p.17) also supports this view.

Other earlier explanations as to *why* back **r** replaced front **r** as the more acceptable pronunciation rely on mere speculation and focus on external societal factors. Trautmann (1880) was of the opinion that *R* originated among the *Précieuses* as a fashion and was thus gradually accepted by others as the favoured pronunciation of **r**. This belief is also shared by Lancaster (1934)<sup>15</sup>. Jespersen (1889), on the other hand, suggested that one merely needs

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<sup>15</sup>Lancaster (1934, p.247-8), like Jespersen, also believes that “this [early] **r** was probably not trilled”. The former suggests that the *Précieuses* tended to replace trilled apical **r** with the softer phoneme *l*, or simply drop it. The uvular realization of **r**, however, was accepted by the

to apply “common sense” to explain the change from *r* to *R*. He speculated that front trilled *r*, which requires greater energy expenditure, would have been practical for outdoor life where loud communication would be necessary. When people's life styles shifted indoors, however, a loud and strong articulation of *r* would no longer have been needed.

In summary, while the various descriptions of as well as the reasons for the *r* > *R* process itself remain without consensus, the above arguments strongly suggest that the existence of uvular *r* may be set at an earlier date, prior to the Middle French period. This single permanent change of the phoneme, and the only one to have affected *r* in all its linguistic contexts, sets it apart from the other consonants. The process resulted in an entirely new realization within the French consonantal system, a realization, however, characterized only by a very different *place* of articulation. The overall *manner* of articulation still resembled that of trilled front *r*. It is important to note that front *r* was probably not directly replaced by this new articulation but may very likely have co-existed temporarily with back *r* (Delattre, 1966; Martinet, 1962, p.201; Wolff, 1958, p.103)<sup>16</sup>. We may therefore assume that, from the perspective of functional analysis, the uvular trill did not infringe on the space occupied by apically trilled *r* within the French consonantal system, but rather took its place in a vacant space among the consonants. A relatively wide range of sporadic variation, to be discussed later in 2.2, is certainly partly due to the co-

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Précieuses, and Lancaster therefore concludes that it must have been the softer fricative, since the stronger uvular trill, like the front trill, would simply have been replaced.

<sup>16</sup>Today, in certain French dialects, such as Quebecois French for example, both *r*-variants still function as allophones of *r*, among a number of other *r*-variants.

existence of these two allophones in Old and Middle French.

### 2.1.2 r-lenition

The general trend of consonant lenition which affected the French consonant system at various stages throughout the evolution of the language also resulted in the temporary loss of mostly final and preconsonantal *r*, primarily during the Middle French period.

*r*-lenition has been the subject of much discussion throughout the past one hundred years, beginning with a concentrated effort in the late 1800's and continuing into the early part of this century. The issue was first examined by a number of researchers who focused exclusively on the *process* of *r* > Ø, including Stork (1891), Andersson (1889 & 1898), and Vising (1899). Several decades later, Clédat (1927) published an article on the same subject in response to Andersson's earlier arguments. A broader approach was adopted by Eurén (1896) and Wolff (1958), who address the loss of *r* within a general discussion of French *r*. Among the historical phonologists, Pope (1934), Nyrop (1935), and especially Straka (1979) have each undertaken a thorough study of the subject.

It is generally believed that loss of *r* did not occur regularly in word-final and preconsonantal position until the Middle French period<sup>17</sup>. In earlier discussions on the subject of lost *r*, deletion of the resonant was said to have occurred primarily in the sixteenth and seventeenth centuries (Stork, 1891, p.22; Vising, 1899, p.583). More recent sources, however, such as Wolff (1958), claim that the process had already occurred in Old French.

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<sup>17</sup>One exception is that, in Late Latin, *r* tended to be lost before *s*, as in *dorsum* > *dossum* > *dos* (Pope, 1934, p.144; Nyrop, 1935, p.367)

Similarly, Straka (1964, p.47) dates the beginnings of  $r > \emptyset$  in preconsonantal and in final positions to the twelfth and thirteenth centuries respectively, as part of what he calls the last wave of “affaiblissement articulatoire”. Pope (1934, pp.156, 158), however, who also suggests that loss of  $r$  occurred preconsonantly prior to being lost in word-final position, dates the process to a considerably later period than does Straka: the latter process to the sixteenth century and the former to the fourteenth century.

General consonant weakening had already manifested itself in late Latin through the loss of occlusion of plosives and in the form of voicing of both stops and fricatives. According to Straka (1964, pp.43-46), a first wave of articulatory weakening dates back to the third century A.D., and resulted primarily in the modification of implosive velar stops [k,g]. A second wave, which saw the weakening of labial and dental plosives, occurred two centuries later, lasting from the fifth to the seventh centuries A.D. As mentioned above, it is the third and final wave, beginning in the ninth and lasting until the twelfth centuries, which finally also affected the resonants. Thus, while obstruents underwent weakening or were completely deleted before the Old French period,  $r$  revealed the effects of consonant lenition only in later Old French and Middle French, its behaviour therefore being similar to that of the other resonants /l, m, n/. The vocalization of  $l$ , for example, did not occur until the tenth century, while nasals did not undergo weakening as a result of the nasalization of vowels until the thirteenth or fourteenth century (Pope, 1934). Among the resonants, it is especially the liquids,  $r$  and  $l$ , which have demonstrated the highest degree of stability in word-final position and during the reduction of consonant clusters throughout the evolution of the language. Furthermore, unlike *all* other consonants including the resonants, regular loss of  $r$

occurred only temporarily, since it was eventually restored in almost all cases, with the exception of *-er* and *-ier* endings. In contemporary French, loss of **r** is limited to a particular phonetic and social context, generally occurring in final consonant clusters and when the style of speech is informal.

With respect to the exact process of **r** > Ø, various, often conflicting explanations have been presented. Taking into account these differing points of view, we present a general overview of the process, based on concrete examples as evidence of **r** > Ø.

### ***Loss of r in Old and Middle French***

IN IMPLOSIVE POSITION:

This position, which according to Straka (1964, p.25 and 1979, p.485) is the weakest of the “positions faibles”, was the first to manifest loss of **r** (Pope, 1934, p.156; Straka, 1964, p.47) as demonstrated by the following examples cited by:

#### 2.1) *Loss of implosive r*

Nyrop (1935, p.367):    *abre* < *arbre*  
                                  *mecredi* < *mercredi*  
                                  *massepain* < *marsepain*  
                                  *valet* or *vallet* < *varlet*  
                                  *paler* or *paller* < *parler*  
                                  *Challes* < *Charles*  
                                  *babiche* < *barbiche*  
                                  *héberger* < *herberger*  
                                  *faubourg* < *forbourc*<sup>18</sup>

Wolff (1958, p.74):    *musseus* < *morsellos*  
                                  *retoner* < *retorner*  
                                  *guadez* < *gardez*  
                                  *fiet* < *fierte*

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<sup>18</sup>These same examples are also cited by Thurot (1881-83, pp.278-279, 289)

*matyrie < martyrie*  
*sevent < servent*

Pope (1934, p.157): *chassieux < chats sieurs*  
*rebous < rebours*  
*toujours < toujours*

Although perceived as a result of general consonant lenition in weak position (Pope, 1934; Straka, 1979), loss of **r** before a consonant does not appear to have occurred to the same extent as did loss of word-final **r**, and various other phonetic explanations are also offered to account for the above examples. Pope (loc. cit.) suggests that **r**, when not lost, was assimilated to a following **l** or **s**, noting that the latter occurrence (*rs > ss*) dates back to late Latin (see p.24, fn.17). Nyrop (loc. cit.), who refers to his list of examples as “cas isolés”, reiterates Pope’s observation while attributing an example like *abre > arbre* to dissimilation<sup>19</sup>. Wolff (1958, p.74), in keeping with the theory of general consonant lenition, declares **r > Ø** to be part of “the general drift of the language toward the open syllable”, pointing out that other resonants underwent weakening at the same time, preconsonantal /l/ through vocalization and the nasal consonants via nasalization of the preceding vowel.

Focusing specifically on syllabic context for **r > Ø**, Fox (1958) emphasizes that loss of **r** in preconsonantal position was not limited to the tonic syllable, as in the word *large*, but also occurred in a word like *largesse*. In particular the vowel /a/, due to a similar

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<sup>19</sup>Both assimilation and dissimilation are given also by Fox (1958) as explanation for the examples above.

articulation<sup>20</sup>, often swallowed up the *r*-phoneme<sup>21</sup>. Fox's assertion is alluded to by Straka (1979, p.484), who subsequently provides the following examples for loss of *r* after /a/: *la(r)gesse, a(r)dent, ca(r)pentier, pa(r)tie*. Fox (1958), like most other linguists<sup>22</sup>, bases his findings on commonly used examples of rhyming pairs in order to demonstrate lost *r* in preconsonantal position, both in tonic and in pretonic syllables. These examples, taken from later Old French and Middle French poetry, most often include pairs such as *sage : large, force : Escoce, courges : rouges, sagesse : largesse*<sup>23 24</sup>.

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<sup>20</sup>“*A* et *r* dental...sont articulés tous les deux avec le dos de la langue placé en bas de la bouche...” (Fox, 1958, p.95).

<sup>21</sup>An example supporting this claim, *Oise < Isara*, may be found in Nyrop's (1935, p.366) earlier discussion of French *r*.

<sup>22</sup>Stork, 1891, p.17; Pope, 1934, p.157; Nyrop, 1934, p.367; Wolff, 1958, p.75; Fox, 1958, p.92 ; Straka, 1979, p.484.

<sup>23</sup>According to Straka (1979, p.484), “Les rimes *dames:armes, sage:large, presse:averse, rouges:courges*, etc., sont nombreuses dans les textes du XIIe siècle au XVIe et prouvent que l'*r* implosive se prononçait si faiblement qu'elle ne comptait pas dans la rime ou, plutôt, qu'elle ne se prononçait pas du tout.”

<sup>24</sup>It appears that these rhyming pairs were considered as valid evidence due to the increasingly popular “riche” or “léonine” rhyming style characteristic of poetry at that time, as indicated in various studies of Old and Middle French versification. During the late Old French period, several restrictions on rhyme emerged, which gradually rendered the use of assonantal pairs unacceptable. Not only was it deemed “improper” to use rhyming words having similar spelling (e.g. *voir : prévoir*), expressing identical or opposite meaning (e.g. *chrétien : païen*), or belonging to the same grammatical category (e.g. *beauté : bonté*), more emphasis was also placed on rhyming as many elements of the two words as possible (Grammont, 1966, pp.36-37). Hence “rime riche” which includes the consonant preceding the final tonic syllable in the rhyme (e.g. *praline : orphéline, tordu : perdu, jouissance : licence*) and “rime léonine”, which includes both the vowel and the “consonne d'appui” preceding the tonic syllable (e.g. *bestiaire : vestiaire, rimer : réprimer, trouva : prouva*), resulted in ‘perfect pairs’ (Tobler, 1910, p.134-135, Elwert, 1961, p.82-83). Another important characteristic of the rhyming style is that it was purely phonetic, that is, spelling was said to be of no importance as long as the “sound” of the two words was identical. Thus a pair of differing vowel tones (eg. *sacré [e] : vrai [ɛ]*) or one with a silent and a realized final consonant (eg. *mourut [Ø] : Ruth [t]*) was deemed unacceptable (Grammont, 1966, p.40). Fox, who gives examples from the poetry of Villon, points out that this fifteenth-century poet primarily used “riche” and “léonine” rhyme in his works. This is corroborated by Suberville

Nevertheless, Andersson (1889) and Eurén (1896) were not convinced by these rhymes in their earlier discussions on the subject. According to the former, the poets most likely lacked a certain sensitivity with respect to consonants, and pairs like *force* : *Escoce* are merely examples of imperfect rhymes. Eurén (1896, p.31) simply notes that the rhyming pairs are only proof of a weaker pronunciation of **r**. but do not imply the complete loss of the **r**-sound. In general, these earlier discussions maintain the belief that preconsonantal loss of **r** was an irregular phenomenon. While both also explain **r** > Ø before **s** and **l** as assimilation, the loss of **r** before any other consonant is simply seen as an exception. Similarly, Clédat (1927, p.102) points out that **r** “ne pouvait pas tomber, en général,...dans l’intérieur d’un mot devant la consonne qu’elle appuie”.

#### IN WORD-FINAL POSITION

There appears to be no argument among linguists that **r** was lost in word-final position of polysyllabic words when followed by a consonant, as for example in expressions like *mouchoir de poche*, *porteur d’eau*, *coupeur de bourses*, *chastreur* (> *chastreux*) *de truies* (Pope, 1934, p.158). Thus, **r** was lost in words ending in *-er*, *-ier*, *-eur*, *-ir*, *-oir*, *-our*, *-or*, *-ur*, and *-ard*, which includes most infinitives of *-er*, *-ir*, and *-oir* verbs and many nouns and adjectives ending in *-ier* and *-eur*. In most monosyllabic words, however, **r** was

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(1968, p.121), who states that Villon is known for the richness of his rhymes at a time when “rime suffisante” (rhyming of only the final tonic vowel and consonant) was the general rule. Thus, taking into consideration the growing popularity of “rime riche” and “rime léonine” during the fifteenth and sixteenth centuries, it would appear that the use of rhyming pairs such as those cited (i.e. *sage:large*, etc.) constitutes valid evidence for **r** > Ø before a consonant. In particular, the citing of poets such as Villon, who are known for the rich and “léonine” style of their rhymes, justifies the assumption that Middle French poetry adequately reflects the phenomenon of preconsonantal loss of **r**.



preserved:

## 2.2) *Preservation of word-final r*

<i>coeur</i>	<i>mer</i>	<i>car</i>
<i>fleur</i>	<i>cher</i>	<i>char</i>
<i>soeur</i>	<i>cler</i>	<i>cor</i>
<i>sûr</i>	<i>fier</i>	<i>pur</i>
<i>mur</i> <sup>25</sup>	<i>hier</i> <sup>26</sup>	<i>dur</i> <sup>27</sup>

Early as well as later sources also mention the influence of certain vowels in the conservation of **r**, for example [ɛ] in *amer, hiver, impair, éclair*, [a] in *richard*, [o] in *essor, trésor, butor, corridor, castor*, and [u] in *futur, azur, obscur*<sup>28</sup>.

In the early discussions, it is suggested that the preservation of **r** in monosyllabic words could be attributed to the inherent quality of the phoneme, described by Vising, 1899, p.587) as “une tendance vers la clarté, la distinction, la beauté même”. It is supposed that **r**'s high resonance makes it such an important part of the word stem that any loss of the resonant would distort the form to such an extent as to render the word unintelligible (Eurén, 1896, p.14; Stork, 1891, p.26). Andersson (1898), however, does not consider the number of syllables to be a determining factor in the preservation of **r**. Instead, he gives the syntactic explanation that **r** is preserved before a pause, adding that it is by coincidence that a great number of lexical monosyllabic words, particularly adjectives placed after the noun, are found before a pause.

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<sup>25</sup>Andersson, 1898, p.155

<sup>26</sup>Pope, 1934, p.159

<sup>27</sup>Timmers, 1977, p.58

<sup>28</sup>Thurot, 1881-83, pp.147-148, 164; Pope, 1934, p.159; Timmers, 1977, p.58.

Much of the discussion on the subject of lost final **r** includes descriptions and explanations of the exact process leading to **r** > Ø in this position. Loss of the resonant is attributed primarily to linguistic factors, such as articulatory aspects and phonetic context. Pope (1934, p.158) suggests that deletion of final **r** originated among the uneducated, the latter not having been influenced by sixteenth-century grammarians who strongly recommended the pronunciation of word-final **r** at the time. While loss of **r** after high vowels is ascribed to phonological factors, *-eur* and *-oir* endings lost final **r** “due to the influence of the forms in which preconsonantal **r** was effaced” (loc. cit.). Straka (1979, p.483) claims that the loss of **r** is directly related to the assibilation of **r**, that the pronunciation of **z** for **r** represents an intermediary stage before complete loss of the resonant (see below, p.45). More precisely, it is the relaxation of the tongue tip that results in a [z], while further weakening of the muscles in the back of the tongue results in no constriction at all, and **r** is consequently lost. The link with assibilation of **r** had already been suggested earlier by Andersson (1889 & 1898), who explains that since **r** was assibilated (i.e. pronounced as “rz”, an intermediary consonant between [r] and [z]) intervocally within a word, the same can be expected for final **r** followed by a vowel-initial word. Furthermore, based on the two examples *j'en ay grand mal au cuez* (< *coeur*)<sup>29</sup> and *Saint Médaze* (< *Saint Médard*)<sup>30</sup>, Andersson (1898) concludes that **r** was also pronounced “rz” in word-final position. The fact that **r** was assibilated in these two contexts naturally led, according to Andersson (1898), to an attempt to do the same before a

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<sup>29</sup>cited by the grammarian Corefully (quoted in Andersson, 1898, p.156).

<sup>30</sup>cited by Nisard, (Andersson, loc. cit.).

consonant. In this context, however, assibilated **r** was lost because a pronunciation of “rz” before a consonant is not possible. Vising (1899) supports Andersson’s explanation, but suggests that the assibilated **r** was only lost after the vowels [i, e, y].

It is more commonly assumed, however, that the assibilation of **r** was not a necessary factor for loss of **r**<sup>31</sup>. The difficulty with Andersson's theory lies in the fact that he fails to clarify under which circumstances **r** is assibilated as opposed to being maintained. Andersson claims that both assibilation and preservation of **r** take place in the same context, namely before a pause:

2.3) *Contexts for loss of final r according to Andersson (1898)*

$$r > \text{“rz”} / \begin{array}{l} V\_V \\ \_ \#V \\ \_ \#\# \end{array} \quad \text{and} \quad 2.2) \quad r > r / \_ \#\#$$

If **r** is assibilated before a pause but may also be preserved in that same context, and if, as according to Andersson, monosyllabicity and the preceding vowel quality do not play a role, it follows that there must be another factor which determines the occurrence of either one or the other process.

Although loss of **r** is primarily discussed with a focus on the specific phonetic context and articulatory process, several earlier approaches consider morpho-syntactic aspects, that is, the type of word form affected. Clédat (1927, p.82), for example, suggests that verb infinitives lost final **r** “par une sorte de confusion entre l’infinitif et le participe

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<sup>31</sup>Pope, 1834, p.158; Wolff, 1958, p.87; Bloch, 1927, p.143; Clédat, 1927, p.85; Gauchat, 1907, p.878.

passé”, since the former only differs from the latter by a final **r**. The form of the past participle, (i.e. the form without final **r**) prevailed over the infinitive because of the former’s more frequent and varied use as both a verb and an adjective (the latter often requiring agreement with the noun). Furthermore, given the fact that language has a tendency to suppress rather than to add inflections, Clédat considers it only logical that the infinitive form would be more susceptible to change. This confusion between infinitives and past participles first provoked loss of final **r** in *-er* verbs and subsequently spread to verbs of the other two conjugations, *-ir* and *-oir*, where it was, however, later restored (see p.36).

With respect to nouns, Clédat (ibid., pp.102-103) suggests that **r** was lost before the *-s* inflection marking plurality, since **r** is much more vulnerable when followed by *s* (see p.24, fn.17). The resonant was therefore first lost in nouns most often used in the plural form, that is, in nouns ending in *-rs*, for example, *écoliers, ouvriers, messieurs, chasseurs, loisirs*.

This process was later extended to other nouns ending in **r**. Those nouns which were more frequently used in the singular, such as *fer, jour, or, malheur, hiver, cœur, mer*, or in front of a pause, “naturally” escaped the **r** > Ø phenomenon more easily. Loss of **r** in adjectives is attributed to “une analogie avec les substantifs de même désinence”, whereas the loss of other consonants is often linked to their position before or after the noun<sup>32</sup>. Clédat (ibid., p.106) ends his discussion by concluding “c’est la fréquence de l’emploi au singulier et à la

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<sup>32</sup>Clédat (ibid., pp. 97-98) explains: “L’adjectif...placé devant le nom, il s’unit à lui, et par conséquent sa consonne finale doit se vocaliser ou s’amuïr si le nom commence par une consonne...Au contraire, placé après le nom, il se trouve à la pause, situation particulièrement favorable à la conservation de la consonne finale. Par conséquent, un adjectif déterminé aura une tendance à perdre ou à conserver cette consonne, selon qu’il s’emploiera ordinairement avant ou après le nom.”

pause qui peut expliquer le maintien de la consonne finale dans les noms et les adjectifs”.

With respect to adjectives, Stork (1891, p.27) also views the feminine form of adjectives as contributing to the preservation of final **r**, explaining that the resonant was not lost in a word like *amer* due to the influence of the form *amère*.

Aside from linguistic factors playing a role in loss of **r**, Wollock (1982, p.206) notes that the *Précieuses* also adopted the loss of **r** as a characteristic of affected speech, based on a 1662 quote from James Howell, “The French women do often-times out of wantonnes leave it unpronounc’d at the end of words”.

#### IN INTERVOCALIC POSITION AND IN “POSITION APPUYÉE”

Intervocalic position, in which most of the other French consonants underwent lenition, did not provide the same favourable context for weakening in the case of **r**. Straka (1979, p.485) attributes the infrequency of intervocalically lost **r** to the fact that the intervocalic position ranks only as third weakest among the “positions faibles”. Although neglecting to provide examples, he notes that loss of **r** in this position was limited to popular speech. Nyrop (1935, p.366) also attributes intervocalic loss of **r**, when it did occur, to an “*étymologie populaire*” but believes it to be restricted to certain dialects as well. Decades earlier, Andersson (1889, p.6) had similarly remarked on the geographical limitation of loss of **r** in intervocalic position, citing examples like *père* > *pee*, *mère* > *mee* found in the regions of Berri Central and la Seine-Inférieure<sup>33</sup>.

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<sup>33</sup>Nyrop (1935, p.363) and Eurén (1896, p.3) also provide some examples of intervocalically lost **r** from the speech of the “*Incrovables*”, who were known for imitating créole speech which was characterized by the failure to pronounce **r** in words such as *incroyable* < *incroyable*, *hoïble* < *horrible*, *paole* < *parole*, and *déliantes* < *délirantes*.

Aside from these examples of intervocalic loss of **r**, Thurot offers some examples of lost **r** within a final consonant cluster (followed by [ə]), which he refers to as the “metatonic” position: *vinaigue* < *vinaigre*, *cofe* < *cofre*, *suque* < *sucre*, *aut* < *autre*, *quat* < *quatre*, *not* < *notre*, *vot* < *votre*, *fenet* < *fenetre* (1881-83, p.278). The **r** > Ø process in this particular context appears to be strictly phonetically motivated. It still occurs in contemporary standard and Canadian French, particularly in frequently used words such as *quatre*, *notre*, and *autre*. The loss of **r** in this context is directly linked to the following schwa, the deletion of which makes it very difficult for a speaker to properly realize the *tr* cluster.

### ***Restoration of r***

The fact that **r** is the last consonant to be affected by lenition has been attributed to a variety of factors. The overall effort by sixteenth-century grammarians and by the educated and higher classes to maintain the pronunciation of **r**, as well as the influence of the written form as a control on changing pronunciations have been cited<sup>34</sup>. The high resonating quality of the **r**-sound itself, as already mentioned above (p.15), has been suggested. These same reasons are used to explain the restoration of **r**. In the seventeenth century, lost **r** began to be pronounced again, primarily because grammarians condemned the failure to pronounce **r** as being socially unacceptable. Furthermore, a particular reverence for Latin, and the fact that loss of **r** never underwent codification in standard French, prevented a permanent loss of the consonant. In preconsonantal position, only a few words never regained their lost **r**,

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<sup>34</sup>Eurén, 1896, p.28; Pope, 1934, pp.158-159; Straka, 1979, p.488.

as in these commonly-cited examples: *babiche, héberger, massepain,* and *valet*. In most other words, for example *mercredi, arbre, Charles, marbre,* etc., **r** was restored. Some words even show a non-etymological **r** in this position, *arquebuse, berlue, Marseille, courtepointe,* and are considered as examples of hypercorrection, an overzealous attempt at restoring lost **r** (Timmers, 1977, p.66). Word final **r** was restored in all verb infinitives and nouns ending in *-ir* and *-oir* (*finir, devoir,* etc.), in almost all nouns and adjectives ending in *-eur* (*vendeur, porteur,* etc., an exception being *monsieur*), and in all words ending in *-our* (e.g. *toujours*). In the infinitives of the first conjugation, however, that is the *-er* verbs, **r** remains unpronounced, as well as in the majority of nouns and adjectives ending in *-er* and *-ier* (*dîner, danger, ouvrier, premier,* etc.). Thus, while the overall process of deletion of **r** was interrupted by primarily external pressures, complete lenition of **r** did achieve some level of permanence in French, particularly among the most common and most frequently used verbs like *aller, parler, manger,* etc..

### ***Recent Loss of r***

Most occurrences of lost **r** which continued into the nineteenth and twentieth centuries are limited to a specific context, already referred to by Thurot as the “metatonic” position (see p.18). According to Eurén (1896, p.12), at the end of the last century, front **r** was often devoiced when preceded by a voiced or unvoiced consonant in the *-re* ending of a word like *autre* and *poudre*. This devoiced **r** would often not be pronounced at all in familiar speech when followed by a consonant-initial word or a pause. In the twentieth century, a similar observation is made by Laks (1977) (see p.55, fn.57 ) as well as by Straka (1963, p.56), who notes that in final position “*r* dorso-vélaire” shows a tendency “à s’ouvrir

et à disparaître...”. More recently, Žečev (1989, p.84) has made a similar observation in his study of words ending in **r/l** + [ə]. He notes that loss of the liquid is especially frequent in words like *libre*, *prendre*, *chiffre*, *sable*, *siffle* (pronounced [lib], [pʁãd], [ʃif], [sab], [sif]), particularly when placed at the end of a phonological group. However, not only does the phonetic context determine this case of **r**-deletion, but social context also plays a role, in that **r** is normally lost in conversational speech yet tends to be preserved in a more formal style of discourse.

### Conclusion

The linguistic context favouring the lenition of **r** as well as the time period marking this process both reflect **r**'s distinct position among the other French consonants and its place within the resonant group. With respect to linguistic context, plosives and fricatives

#### 2.4) Tabular summary of velarization and loss of **r**

	PRE-ROMANCE	GALLO-ROMANCE	OLD FRENCH		MIDDLE FRENCH		FRENCH		MODERN FRENCH		
	5TH	9TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH
#__					<i>r</i> > <i>R</i>			<b>R</b> > <b>ʁ</b>			
C__					<i>r</i> > <i>R</i>			<b>R</b> > <b>ʁ</b>			
V__V					<i>r</i> > <i>R</i>			<b>R</b> > <b>ʁ</b>			
__C						<i>r</i> > <i>R</i>		<b>R</b> > <b>ʁ</b>			
__#						<i>r</i> > <i>R</i>		<b>R</b> > <b>ʁ</b>			
						<i>r</i> > Ø		<b>R</b> > Ø			



generally underwent lenition in a number of weak positions, including implosive, final and intervocalic positions. The resonant **r**, however, was only lost regularly in word-final position and, to a lesser extent, in implosive position. Similar to the other resonants, **l** and the nasals, **r** was not significantly affected by consonant lenition in intervocalic position. Furthermore, the **r**-phoneme, not undergoing deletion until late Old French and throughout Middle French, was the last consonant to be affected by consonant weakening, once again at a time when other resonants also underwent modification. Finally, while **r**'s overall resistance to weakening characterizes it as one of the resonants when compared with the early lenition of plosives and fricatives, its subsequent restoration sets it apart from *all* French consonants. It is only in the case of **r** that the process of consonant lenition was not only interrupted but also reversed.

## 2.2 Sporadic Changes Involving French **r**

The involvement of **r** in a wide range of variation with other French phonemes includes alternations that have occurred almost continuously throughout the evolution of the resonant, such as the fluctuation between **r** and **l**, while others have been observed more infrequently, for example **r**-alternation with the dental voiced plosive and the dental nasal, or the vocalization of **r**. Another **r**-alternation that has received much discussion is the assibilation of French **r**, that is, the change from **r** to a voiced, most often sibilant, dental fricative<sup>35</sup>. These changes to **r** have been attributed to a variety of factors, linguistic or

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<sup>35</sup>Fought (1961-62, p.7) deems the term "sigmatism" as more useful for describing "the substitution of s for an etymological **r** in written French". According to David Crystal's *Dictionary of Language and Languages* (London: Penguin Books, 1994, p.353), however, this

other: assimilation or dissimilation, borrowing, weakened or “sloppy” articulation, confusion in the distinction of both the perception and realization of the sounds, as well as societal pressures. Given these factors, many processes of **r**-variation may be viewed as representing a sound *substitution* as opposed to a sound *change*, although the latter is also suggested. We begin our discussion with the more commonly known of these processes, the alternation between **r** and **l** and the assibilation of **r**.

### ***r*-alternation with *l***

Not surprisingly, one of the most frequent alternations involving **r** occurs with the other liquid resonant, the phoneme **l**, an alternation which dates back to antiquity<sup>36</sup>. During the evolution from Latin to Romance, **r** has been found to alternate frequently with **l**, involving both a change from **r** > **l** as well as the reverse process, a change from **l** > **r**:

#### 2.5) *Examples of r-alternation with l*

**r** > **l**: *periculum* > *peligro*  
*arborem* > *albero*  
*fragrare* > *flairer*

**l** > **r**: *sulcum* > *surco*  
*lilium* > *lirio*

Some view the alternation between **r** and **l** specifically as a result of dissimilation (Wolff,

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term more specifically refers to the abnormal pronunciation of **r** known as *lisp*ing. We thus consider “assibilation”, defined as “la transformation d’une occlusive en une sifflante” (*Dictionnaire de linguistique et des sciences du langage*, Paris: Larousse, 1994 ed., p.55), to be more appropriate.

<sup>36</sup>It is noted, for example, that in the Greek comedy *The Wasps* Alcibiades had a tendency to pronounce **l** for the letter **r** (Wolff, 1958, p.42; Wollock, 1982, p.196)

1958, p.42; Eurén, 1896, p.19). Eurén (1896, pp.19-23) offers examples showing the change from **l** > **r** in a wide range of contexts, including initial position:

2.6) *Linguistic context for r ~ l*

- a) #\_\_            e.g. *Rossignoi* < *lusciniolus*
- b) V\_\_V        e.g. *caramel* < *calamellus*
- c) \_\_C           e.g. *orme* < *ulmus*
- d) C\_\_           e.g. *lambouri* < *umbilicum*  
                   *esclandre* < *scandalum*  
                   *chapitre* < *capitulum*  
                   *angre* < *angelus*  
                   *navire* < *navilium*
- e) \_\_#            e.g. *cier* < *ciel*  
                   *mier* < *miel*

It should be noted here that where the process occurred before yod, it was the palatal l-variant [ʎ] that alternated with r. Rhyming pairs have been presented by Wolff (1958, p.42) as further evidence for r ~ l alternation in Old French, such as *narilles* : *sires*, which represents an example of intervocalic r ~ l alternation. Similarly, Straka (1964, p.54) suggests that the following alternate spellings, *furrer* ~ *furrel* and *carner* ~ *carnel*, dating from the thirteenth century, also demonstrate a certain confusion between the two liquids among speakers at that time. According to Straka, the alternation of r with other consonants such as [l] and [z] in Old French as well as Middle French, supports his claim that r went through a general period of weakening, which, as mentioned earlier (see p.25), coincides with the third general wave of “affaiblissement articulatoire”. Straka points out, however, that the degree of weakening for the r > l process is considerably less when compared with the assibilation of r, and found only in frequently used words and popular speech (1979,

p.482). In the sixteenth and seventeenth centuries, the **r** ~ **l** alternation continued, primarily in intervocalic position - *ensorcerer* > *ensorceler*, *materas* > *matelas*, *frireux* > *frileux* (Nyrop, 1935 pp.363-364). Alternation between **r** and **l** also occurred before and after a consonant, however, for example in *armoire*~ *almoire* (Wolff, 1958, p.43), *fribustier*~ *flibustier* (Nyrop, 1935, p.365), and at the end of a word, as in *pourpre*~ *poulpe* (Wolff, 1958, p.43), *alter* ~ *altel* (Nyrop, 1935, p.368). In the seventeenth century, the affected speech of the Précieuses was characterized, apart from other linguistic particularities, by the pronunciation of **l** in place of **r**. Examples of this are seen again in R. Poisson's 1665 play entitled *L'Après -Soupe des Auberges* (ref. cited on p.3): "C'est poul vous disle donc..."<sup>37</sup> and in the 1670 comedy *Élomire hypocondre* in the line "...celtes, je suis à bout pal un tel plocédé..."<sup>38</sup> (Nyrop, 1902, p.46). According to Straka (1979, p.482), the Précieuses adopted the pronunciation **l** in place of **r** "par répulsion contre l'assibilation".<sup>39</sup> Finally, contemporary French still exhibits occasional **r** ~ **l** alternation or traces thereof.<sup>40</sup>

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<sup>37</sup>*C'est pour vous dirle [sic] donc...*

<sup>38</sup>*...certes, je suis à bout par un tel procédé...*

<sup>39</sup>Aside from alternating with **l** in Old and Middle French, **r** was also often assimilated to a following **l** during this period, as in the verb *parler*~ *paller*, for example (Pope, 1934, p.157; Fox, 1958, p.94) and in words such as *Challes* (*Charles*), *vallet* (*varlet*), and *malle* (*marle*) (Nyrop, 1935, p.367) The exact process by which **rl** became **ll** has not been determined. It is thought that either **r** became **l** directly, thus representing an **r** > **l** change, or that **r** was first lost and then replaced by **l**. The above examples have therefore been included in our discussion of loss of **r**.

<sup>40</sup>Eurén (1896, pp.37-38) observed that the **r** > **l** process was found to occur intervocalically in various patois across France, for example: *cerisia* > *celise*, *corridor* > *colidor*, *prière* > *peuriéle* and that in the Cotentin region of Normandy front **r** in intervocalic position often resembles the sound **l**. According to Bloch, (1927, p.139), in the Swiss region of Valais the variant [r] resembles an **l**. Taylor (1952, p.224) found that in the French Creole dialect spoken on Martinique, apical **r** of English, Spanish and native Indian loan words is not equated with French **r** and subsequently not pronounced as the Creole fricative, but is instead replaced by **l**. Furthermore, Straka and Nauton (1945, p.216) mention in their study of French **r**-variants in the Haute-Loire

It is commonly accepted that **r**'s alternation with **l** indicates that the **r**-resonant was pronounced in the front of the mouth since **l** is also a dental consonant. Pope (1934, p.153), however, reminds us that the sound system of Latin also included palatalized and velarized **l**'s, the latter most often found in preconsonantal position and vocalized to **u**. These **l**-variants were carried into Old French and survived until the middle of the twelfth century. Based on this observation, Wolff (1958, p.62) claims that when Old French **r** alternated in preconsonantal position with [ʎ] (when this velarized **l** was not vocalized to [u]) **r** was also articulated in the back of the mouth. In other words, **r** was uvular in the following Old French words: *corpable~ colpable, corper~ colper, corpe~ colpe, carculer~ calculer*.

Consequently, similar to its lateral counterpart **l**, the **r**-sound also appears to have been affected by the process of vocalization, given a number of examples demonstrating an alternation from **r** to **u** (see below). Like Wolff, many interpret the vocalization of **r** as an indication that the resonant involved in this process was realized in the back of the mouth, that is, pronounced *R*.<sup>41</sup> As noted above, vocalization of **r** to **u** in Old and Middle French occurred in the same context as the vocalization of **l**, namely in preconsonantal position: *arbre~ aubre, arme~ aume, herbergie~ aubergie(r), armoire~ aumoire, marbre~ maubre*

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that certain traces of the **l** > **r** process still exist. The older generation of speakers in the western part of the region still makes a small distinction between **r** derived from **l** and etymological **r**, the former characterized by a slightly more posterior realization. In contemporary Parisian French, **r** and **l** still alternate in the words *alchimie ~ archimie* and *calculer ~ carculer* (Wolff, 1958, p.43).

<sup>41</sup>Ulbrich (1878, pp.543-544), for example, also claims that it is very likely for **r** to have been guttural because it alternated with the frequently vocalized **l**-phoneme. (...“Allein gerade der Umstand, dass **r** mit einem Consonanten vertauscht wird, welcher fortwährend der Vocalisirung zu **u** unterliegt, ist geeignet den Glauben an linguales **r** zu erschüttern; denn was hat **u** mit der Vorderzunge zu thun, welche jenes **r** bildet?...)

(Eurén, 1896, p.46; Wolff, 1958, p.64). Eurén (1896, p.46) speculates that vocalization of *R* may have begun with a change from *R* > *l*, due to dissimilation, whereafter the *l* may subsequently have been vocalized to *u*, as attested to by the form of the word *albre*. While the *r* > *u* process has left some traces in Modern French, as in the commonly cited place name *Auvergne* < *Arvernia* for example, in most cases it only occurred temporarily.

Given the similarities between *r* and *l*, it is understandable that these two sounds should alternate so frequently. As resonant consonants, the additional distinction as “liquids” sets these two phonemes apart from the nasals and approximants. On an articulatory level this distinction is characterized by the tongue’s particular involvement in the realization of *r* and *l*. From a phonetic perspective, the change from *r* to *l* is usually considered to be a result of weakening in the articulation of the former sound. Nyrop (1902, p.46) explains that *r* often passes to *l* due to an “articulation nonchalante du *r* apical qui cesse de vibrer ou ne vibre que mollement” and that speakers who are unfamiliar with one or the other sound, are most likely to confuse them. Straka (1979) explains more precisely that:

...la faiblesse articuloire se porte plus spécialement sur les ailes de la langue qui se détachent ainsi des bords latéraux de la voûte, tandis que la pointe, ayant perdu son élasticité et cherchant un point d'appui, s'applique aux alvéoles à l'endroit même où, auparavant, elle produisait des battements.(1979, p.482)

In terms of acoustics, the high degree of vocalic resonance characterizing both liquids further illustrates why *r* and *l* are easily confused with each other. In order to distinguish between these two sounds on a spectrogram a third formant is needed, which for *l* remains straight but for *r* swerves down to the second formant. (Wolff, 1958, p.45, Posner, 1961,

p.104).

In conclusion, we may say that alternation between the liquids **r** and **l** reveals itself as one of the most common among the **r**-processes. This is demonstrated not only by the frequency of its occurrence but by an overall “flexibility” between the two phonemes in alternation, in that it has taken place in all positions and most often involved a change in both directions, from **r** > **l** and from **l** > **r**.

### *Assibilation of French r*

Although French **r** was not regularly lost in intervocalic position as were most of the other consonants in the language, the **r**-phoneme did, nevertheless, undergo variation of another kind in this “position faible”, an alternation that has received much discussion to date: the assibilation of front **r**. During the later period of Old French and especially in Middle French, intervocalic **r** was often found to be written as “s” or “z”, interpreted as representing any sound ranging from a non-trilled **r** to a sibilant or interdental fricative and which we will henceforth refer to as Z<sup>42</sup>. The fact that this change involved alternation with a dental consonant suggests that **r** was still primarily articulated apically in the alveolar region of the mouth at the time this process took place. Most linguists date the assibilation of **r** to a period including the fifteenth and sixteenth centuries and ending in the first half of the seventeenth century.<sup>43</sup> According to Fought (1961-62, p.10) and Eurén (1896, p.43), the

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<sup>42</sup>We use the symbol Z here to represent an assibilated **r** because the various, often vague, phonetic descriptions of this sound seem to include any sound resembling or ranging between **r** and **z**, either dental or interdental, sibilant or non-sibilant, including [ð].

<sup>43</sup>Trautmann, 1880, p.213; Andersson, 1889, p.6; Stork, 1891, p.23; Eurén, 1896, p.43; Millet, 1926, p.10; Pope, 1934, p.157; Nyrop, 1935, p.364; Haden, 1955, p.506; Wolff, 1958, p.60; Lozachmeur, 1976, p.316; Straka, 1979, p.481.

first reliable examples of **r** > **z** date back to the middle of the thirteenth century, indicating that the phonetic process was already occurring in Old French.

The assibilation of **r** occurred primarily in intervocalic position (*heuzeug* < *heureux*, *mazi* < *mari*, *Pazi* < *Paris*), although a number of examples also show **r** pronounced as **Z** in final position (*peuz* < *peur*)<sup>44</sup>, before a consonant (*dozmir* < *dormir*, *gandasme* < *gendarme*), as well as after a consonant (*psomené* < *promené*, *counestezait* < *connaître*) (Rosset, 1911, pp.295-296). Assibilation of **r** is most commonly explained as a weakening in the articulation of the liquid<sup>45</sup>, and, as noted above (see p.31), is viewed by Straka (1964) as part of the final stage of general consonant lenition. Since most other French consonants sustained considerable weakening in this "position faible", it is generally assumed that some type of modification, if not complete loss, would also affect intervocalic **r**. Most often, loss of trilling is considered as the principal characteristic of weakened **r** (Pope, 1934, p.157; Nyrop, 1935, p.364; Straka, 1965, p.473). Straka (loc. cit.) more precisely explains that, in a weakened articulation of **r** the contact area is smaller due to a lower elevation of the tongue. Because the tongue tip is not raised as high, it touches the alveolar ridge at a slightly lower point and hence, also a little further forward. Consequently, the slightly advanced articulation of **r** causes it to resemble a French [z]. Fought (1961-62, p.9), who similarly attributes assibilation of **r** to its place within a word, also suggests that an adjacent high

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<sup>44</sup>According to Pope, assibilation of **r** in final position occurred mainly in the southern and central regions of France (p.159).

<sup>45</sup>Stork, 1891, p.25; Pope, 1934, p.157; Nyrop, 1935, p.364; Straka, 1965, p.469



vowel may have made the trilling of *r* difficult<sup>46</sup>.

According to Straka (1979, pp.471-481) the transition from *r* to [z] would have occurred in two ways, either via an interdental fricative [ð], or via what he refers to as a predorsal trill [r̥]. In the case of the first variant, *r* lost its trill and resembled an *l*- or *d*-sound, which, with further relaxation of the articulatory muscles, became an interdental fricative:

Le coloriage<sup>48</sup> du palais ou de la langue révèle que l'appui se produit uniquement par les bords de la langue antérieure qui ne font qu'effleurer les prémolaires, les canines et les petites incisives supérieures, tandis que la pointe, détachée de son lieu d'articulation primitif, avance légèrement au-dessous des grandes incisives. L'impression auditive est assez proche de celle du */h* anglais sonore. (1979, p.475)

If, at this stage, the tip of the tongue is lowered further, the contact with the alveolar ridge is made slightly farther back behind the tongue tip and a [z] is pronounced. With respect to the second possible transition from *r* to [z], the weakened tip of the tongue is bent under towards the lower incisors, the constriction thus occurring with the top of the tongue.

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<sup>46</sup>Fought, basing his theory on the fact that *r* very frequently appeared after [i, y, e] according to the ALF, suggests that *r* was first assibilated when it was preceded by a high front vowel and that this fricative pronunciation later passed to other contexts by analogy. He explains, "[a]pical *r* is a retroflex articulation, in which the tip of the tongue, held in nearly vertical position, is caused to vibrate by an egressive air stream. In the articulation of a high front vowel, the jaws are relatively closed, and the vibrating portion of the tongue is necessarily shortened, compared with its length after, say [a]. This inevitably raises the frequency at which the tip vibrates. At some critical juncture of these three factors: the rate of vibration, degree of muscular control, and care of articulation, the regular trilling of the tip against the palate will tend to change into friction".

<sup>47</sup>These two variants have been encountered by Straka (1979, pp.474-477) in the departments of Haute Loire, Loire and Puy de Dôme.

<sup>48</sup>on a palatogram (a photograph taken of the roof of the mouth after a powder, which has been applied to an inserted artificial palate, is rubbed off during the articulation of a sound due to tongue contact with the palate - a technique used in palatography, the instrumental study of articulation).

directly behind the apex, that is, pre-dorsally. Consequently, the tongue beats against the alveolar ridge, producing a light trill. If the tongue ceases to “vibrate”, the sound becomes a fricative and assumes the realization of [z]. Straka notes that, in both cases, it is only the apex of the tongue which is weakened. In the case of the pre-dorsal trill, however, the muscles in the rest of the tongue compensate for the loss of activity in the tip by raising the body towards the palate, and, therefore, the overall energy expenditure of an articulated pre-dorsal trill is the same as that of an apico-alveolar trilled **r**. Since the reverse transition **z > r** is also said to have occurred at that time (see below) Straka suggests that the assibilation of **r** was most likely effected via the interdental fricative which can be more easily reversed than the **r > [r̥] > [z]** process. He notes that a regression is physically more difficult if the tongue is in a bent position, as in the case of pre-dorsal **z**. Straka however, does not exclude the occurrence of a **z > r** transition of the second type, noting that:

[...] elle demande une élévation assez considérable du corps de la langue, mais la tendance à l'assibilation est contemporaine de la tendance palatalisante [...]; la combinaison de ces deux mouvements n'était donc pas contraire aux possibilités articulatoires de l'époque. (Straka. 1979, p.481)

In his earlier discussion of French **r**, Eurén (1896, p.44) had suggested that, given the fact that the reverse process, **z > r**, occurred at the same time as the assibilation of **r**, the alternation between the two phonemes was produced by an intermediary sound resembling both **r** and **z**. The **r > z** process took place more frequently than the reverse, because the resonant requires a greater output of articulatory energy and, according to Eurén, is therefore more susceptible to a general trend of weakening than **z**.

With respect to the geographical context of **r**-assibilation, the fricative pronunciation of **r** is said to have originated in popular speech (Thurot, 1881-83, p.273; Giauque, 1975,

p.410) in the southern regions of France, and then moved north across central France until finally reaching Paris in the sixteenth century. Some have argued, however, that the confusion between front **r** and [z] was purely a dialectal phenomenon (Clédat, 1927, p.85) limited to the Gard and Hérault departments of the Languedoc region (Meyer, 1875, p.194). Martinet (1962, pp.200-201) suggests that the assibilation of front **r** caused no confusion for Parisian speakers in the sixteenth century. He claims that the words *mes frères* and *mes fraises* were not homonyms, explaining that “soit que la sifflante n'ait pas été la même dans les deux mots, soit qu'en face de la voyelle simple du premier mot le second ait encore présenté une diphtongue”. In various patois, however, assibilated and interdental variants of **r** have been found still to exist today <sup>49</sup>. This leads us to believe that assibilation of **r** could

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<sup>49</sup>A significant number of examples demonstrating assibilation of **r** in contemporary French have been found in various regions across France, where a front trilled **r** is still pronounced today. While Millet (1926) examined the interdental fricative realization for **r** found specifically in the region of Haut-Berry, Bloch (1927) provided an extensive overview of assibilated intervocalic and word-final **r**-variants observed in various patois throughout France at the end of the nineteenth century. In central France, Bloch found the articulation of [ð] in words like *labourer* and *chaudière* and [z] in the word *crémaillère* (ibid., pp.95-96). In the Orléanais region and the department of Nièvre, [z] was found in words such as *parer*, *frère* and *mère*, while [ð], though not as common as [z], could be found in *mesurer* (ibid., pp.104-106). An intermediary assibilated variant, [ʀ̥], was heard in the verbs *dire* and *lire* (ibid., p.107). The departments of Rhône, Ain, and the Savoie represented the highest occurrence of **r** as [ð] in all of France. Furthermore, Bloch mentioned the realization of an interdental **r** in neighbouring Isère, as well as in the Puy-de-Dôme region, which we equate with the predorsal trilled variant described by Straka (1979, p.477) also found in a part of Puy-de-Dôme (see p.46, n.47). In this same region, Bloch (1927, p.140) also came across “une interdendale en voie d’amuïssement”, which we interpret as a very weak, almost breathy interdental fricative. In Provence, [z] was pronounced in place of **r** in the word *laurier* (ibid., p.138). Finally, Bloch pointed out an interdental pronunciation of **r** in words found on the islands of Jersey and Guernsey, as in *mariage*, *mourir*, *faire*, *aurons*, *pleurer* (ibid., pp.121-122). More recently, Spence (1957) also examined the process of assibilation on the island of Jersey. According to his observations, assibilation affects intervocalic front **r** in two stages, the first ending in the realization of an interdental fricative and the second resulting in [z]. In the north-west region of the island, **r** is pronounced as [ð], while the less common variant [z] is primarily heard in the south-eastern part of Jersey. In the central and north-eastern parts of the island **r** is predominantly maintained as a weak voiced alveolar trill which undergoes devoicing in final position and when in contact with a consonant. Outside France, Vinay (1950, p.495)

very well have been a more wide-spread phenomenon than originally thought. The only words found in standard French today as a trace of assibilated **r** include *chaise*~ *chaire* < *cathedra*, *besicle*~ *bericle* < *\*beryllus*, and *nasille*~ *narille* < *naricula* (Eurén, 1896, p.40).

#### RESTORATION OF R

The pronunciation of front **r** for [z], which also occurred mainly in intervocalic position at the same time as **r**-assibilation<sup>50</sup>, is generally not considered to be a physiological regression<sup>51</sup> of assibilated **r** (Straka, 1979, p.481) but rather a result of external factors. Most view the process as part of the overall confusion between the two consonants, brought about by the assibilation process and the frequent cases of hyper-correction by those strongly opposed to the fricative realization of **r**. Some examples of this “false regression”<sup>52</sup> include *Jeru Masia* < *Jesu Maria*, *eglire* < *église*, *rairon* < *raison*. The confusion between **r** and **Z** finally ended when the resonant was restored to its place, primarily due to the influence of grammarians and the written language, both of which seemed to have had a

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observed an assibilated variant of **r** in initial and final position in the dialects of Acadian French, spoken in the Canadian provinces of New Brunswick and Nova Scotia.

<sup>50</sup>Although a certain number of Old French words also show preconsonantal **s** written as **r**, especially before **l** as in *marle* ~ *masle* < *masculum*, *merler* ~ *mesler* < *misculare*, *varlet* ~ *vaslet* < *vassalem* (Eurén, 1896, p.29; Nyrop, 1935, p.436), this alternation is explained as part of the tendency of dental consonants to alternate in preconsonantal position (see p.50).

<sup>51</sup>Pope (1934, p.68) notes that the term *regression* refers to “the *restoration* of moribund traditional sounds or forms”, based on Dauzat’s definition of the term: “La restitution dans une série fonétique sous l’influence d’un parler directeur ou de forces conservatrices (grammairiens, orthographe, etc.), –d’un son que le jeu normal des lois fonétiques avait transformé ou éliminé.”

<sup>52</sup>defined by Pope (1934, p.68) as “the *replacement* of a traditional sound under a *misapprehension*...”.

stabilizing effect. Another commonly cited factor, linguistic in this case, is the guttural pronunciation of **r**, which was rapidly gaining popularity at that time. It is this new articulation of the resonant which is considered to have been a major cause for ending the confusion of **r** and **Z**.

The above examination of assibilated **r** demonstrates that, aside from extensive alternation with the dental lateral, **r** also shows considerable alternation with the dental fricatives during the evolution of the language. It is consequently not surprising to find **r** in alternation with other dental phonemes, namely the voiced plosive and nasal dental, which leads us to a discussion of the following two **r**-processes: **r**-alternation with **d** and **n**.

### *Voiced Dental Plosive ~ r*

The various processes involving a voiced dental plosive and the **r**-phoneme occurred primarily in late Latin and Old French. The sound [d] (either etymological **d**, or **t** which through voicing was weakened to **d**) often changed to **r** before the sounds **n** and yod, as in the Old French words *borne* < \**bod(i)na* or \**hot(i)na* and *mire* < *medicus*, *estuire* < *studium* (Eurén, 1896, pp.32-33; Straka, 1964, p.47). Eurén explains the **d** > **r** process in the first context as another example of alternating dental consonants ([r,d,z]) before **n**, since the same word also occurred as *bosne* and *bodne*. Straka more specifically observes that in this particular context (before **n**), weakening of the dentals occurred either via the sibilant fricative **s** ([z]), or ended in **r**. With respect to the second context, the process **d** > **r** before [j] has received various explanations by Tobler, Paris, and Havet (as discussed in Eurén, 1896, pp.33-35). According to Tobler, **r** simply replaces a lost **d**. Paris claims that **d** first became **l mouillé** [ʎ] before changing to **r**, based on the frequent alternation between **r** and

[ʎ] in Old French words like *concilium* > *concire*, *evangelium* > *évangire*, and also demonstrated by the different name forms *Gide*, *Gil(l)es*, and *Gire* (< *Aegidius*). Havet maintains that, as usual, [d] weakened to [ð] but then, instead of being lost, changed to r due to its contact with yod. He considers this d > r process to be the most plausible since [ð] so closely resembles [z], the latter also having frequently alternated with r. Eurén offers a combination of these slightly contradictory theories by concluding that an intermediary sound was indeed present in the transition from d to r; a sound very much resembling either [ð], [ʎ], or a weakly trilled r, which was finally codified as r (1896, p.35).

With respect to the type of process in which r replaced d, it appears that in all cases, d > r occurred via a voiced fricative, either an interdental [ð] or a sibilant [z]. Based on these observations, it seems more accurate to assume that r never replaced d directly but instead always by way of an intermediary sound.

Although an alternation from r > d has been recorded on two occasions, this process has only been observed in a few patois, notably in southern France around the turn of this century<sup>53</sup>. Nevertheless, the occurrence of a change from apical r to d does not appear unlikely given r's alternation with the dental fricative [ð] in the same context.

### *Nasal Dental > r*

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<sup>53</sup>Meyer (1875, p.194) observed a change from assibilated intervocalic r to a dental plosive in the Rouergat patois, where the words *paire*, *maire*, and *Peire* (*père*, *mère*, *Pierre*) were pronounced *paide*, *maide*, and *Peide*. The second observation was made by Bloch (1927, p.149, pp.155-156), who noted that this intervocalic change from r to d was found in the regions of Hérault, Gard, Hague, Val de Saire and Seine-Inférieure in words like *mariage*, *poireau*, *chaudière*, *curé*, and *noire*, and, according to him, demonstrated the fact that “la difficulté d’articuler la vibrante persiste après son rétablissement”.

Another dental sound occasionally replaced by front **r** in the course of the evolution of French is the nasal consonant **n**, a process which is most often interpreted as a result of dissimilation or borrowing. The change usually occurred in intervocalic position, as in the example *verin/vrin* < *venenum*. When loss of a vowel brought **n** into contact with a consonant the process also occurred preconsonantly, particularly before [m, b, r], and in postconsonantal position, primarily after [p, f, d, k], e.g. *Londres* < *Londinum* or *pampre* < *pampinum* (Eurén, 1896, pp.24-28; Nyrop, 1935, p.337).

A much earlier example of the **n** > **r** change is discussed by F. Falc'hun (1972, pp.109-112), who suggests the process already occurred in the pre-Romance period, citing examples of place names as evidence. For example, the gallic or Old Breton<sup>54</sup> word *tnou* (meaning "valley") is found today as *Trôo*, *Treux*, and *Trun* in French, the final **n** in the last name being considered to be a remnant of nasality left by the former **n** now replaced by **r**. Another example is the celtic root *cnoc* (signifying "height" or "mountain"), which became *knech* in Middle Breton; in Modern Breton it is found in names such as *Crec'h*, *Créac'h*, and *Kergrec'h*. Falc'hun also points out that the process of **n** > **r** is continued throughout the evolution from Latin to French, in words such as *diaconum* > *diacre* and *ordinem* > *ordre*, examples also cited by Eurén (see above) in his own discussion of preconsonantal **r**-alternation with **n**.

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<sup>54</sup>Falc'hun's justification for basing his theory on Breton names is due to his belief that Modern Breton is a mixture of insular Celtic and Armorican Gallic. He explains, "Cette façon de voir, très défendable par des arguments historiques, justifie certains rapprochements entre toponymes français d'origine gauloise et toponymes bretons assez différenciés par rapport à leurs équivalents insulaires. Il n'est donc pas interdit de rechercher si certaines évolutions phonétiques qui ont pu passer pour bretonnes ne seraient pas les témoins d'évolutions plus largement répandues dans toute l'ancienne Gaule" (p.110).

### *Velar / Laryngeal Fricative > R*

While most cases of **r**-alternation involve the front variant, the back variant has not escaped modification. Aside from the already-mentioned vocalization of *R* (see p.42), the resonant has been found to alternate with fricatives which are characterized by a similar place of articulation. An example of such an alternation, which specifically involves the uvular **r**-variant and a voiceless guttural fricative, has also been examined by Falc'hun (1972, pp.112-115). His findings on the evolution of the Celtic fricatives **ch**<sup>55</sup> or **h** into French back **r** are again based on examples of place names. Falc'hun suggests that the **r** found in many place names across France “continue une ancienne spirante vélaire celtique issue de *c*”, and that this **r** was therefore posterior in articulation to begin with. The Celtic root *cnec*, meaning “elevation”, is found as *nec*, *neh*, *ner*, or *né* in names like *Pen-Nec'h* (Breton) and *Pennère* (French) and in the name *Néewiller*, also written as *Nehwiller*, while the name of the town *Ners* is often pronounced with the velar fricative as [nɛx]. The change from **h** to *R* is also demonstrated by the Middle Breton word *knech*, which Falc'hun shows to be represented today as *Quénard* and *Quinard* (among other forms). While *Canec'h* is represented as *Caner*, the name *Canac'h* is found as *Canard* in the department Côtes-du-Nord. Falc'hun admits that these examples do not necessarily prove to a certainty that an **h** > **r** change occurred in the evolution from Gallic to Romance. He does note, however, that “appuyés sur des toponymes bretons apparemment identiques, où cette évolution **h** > **r**

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<sup>55</sup>We assume here that the velar fricative in question is voiceless, even though this is not specifically indicated by Falc'hun. Our assumption is based on the fact that we are concerned with alternations between the velar fricative and the equally voiceless laryngeal fricative **h**. Moreover, the provided transcription [nɛx] (Falc'hun, 1972, p.113) leads us to believe that we are dealing with the voiceless variant.



ne peut être mise en doute, [ces exemples] forment un faisceau de faits convergents de nature à justifier une conclusion proche de la certitude” (ibid., p.114). At the very least, the examples indicate that a guttural pronunciation of *r* already existed prior to the beginnings of the French language. Today, alternation between *R* and *h* is still found in certain dialects

### 2.7) Tabular summary of *r*-alternation

	PRE-ROMANCE	GALLO-ROMANCE	OLD FRENCH		MIDDLE FRENCH		FRENCH		MODERN FRENCH		
	5TH	9TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH
#__			l > r								
C__	n > r	r > l	l ~ r n > r				l ~ r ----> (r > Z)				
V__V		r > l	l ~ r n > r				l ~ r ---->		r > l ---->		
					r > Z ----->				r > z/ð		
						z > r ----->			(r > d)		
		r > l	l > r r > l/_l ----->				l ~ r ---->				
__C			k > r/_j t > R    R > u n > r r ~ d ~ z/_n				(r > Z)				
__#	x/h > R		l > r				(r > Z)				

in France<sup>56</sup> while the reverse process of *r* > *h* occurs when *R* is lost, often in word-final

<sup>56</sup>Léon (1967, p.140) points out that the speakers of the Cotentin area pronounce a variant of *r* that is aspirated and at the same time realize an *h* that is very consonantal in character. The result is a tendency to confuse *r* with the sound *h*. This confusion occurs in initial and in medial position of a word, (*h* never appears in final position) in the pair *haie* ~ *raie*, and in very frequently used words like *hareng*, *homard*, *haras*. Often the *r* and *h* opposition is neutralised with an intermediary sound which Léon describes as an “*r* aspiré probablement à constriction pharyngale et avec vibration uvulaire entraînée par l'énergie du souffle expiratoire...[l]e son est rauque et même si les cordes vocales continuent de vibrer.... il paraît souvent sourd, à cause vraisemblablement de son intensité”. Eurén (1896, p.36) also mentions the pronunciation of

position, leaving as a trace only a breathy sound similar to an h-sound<sup>57</sup>.

According to the data presented in 2.7) and 2.4) (see p.37), front **r**-variation occurred in almost all contexts, whereas back **r** only alternated in preconsonantal and final position with another sound (except where the alternation takes place between two **r**-variants).

Furthermore, the only processes to occur in every context involve the liquids [l] and [ʁ].

The most frequent and varied occurrence of alternation (or sporadic modification) took place in preconsonantal position, and primarily in Old French. Alternation of **r** was less common in intervocalic and postconsonantal position during this time period, followed by even fewer instances in final position. Very limited change occurred in initial position. The global sound changes involving **r**, as well as the assibilation of **r** and the continued **r**-alternation with **l**, did not occur until the Middle French period, again primarily in preconsonantal position and to a lesser extent in final and intervocalic position. When compared with Straka's (1964, p.25; 1979, p.485) ranking of syllable positions (from weakest to strongest), regarded as a significant factor in the description of phonetic change, our data shows a similar grouping of positions:

2.8) *Straka's (1964) ranking of syllable positions favouring sound change*

- 1) *implosive position*
- 2) *word-final position*
- 3) *intervocalic position*
- 4) *postconsonantal (and initial) position*

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uvular **r** as an aspirated **h** in the same region, giving as examples *raricots* ~ *haricots*, *rèe* ~ *haie*, and *ramè* ~ *hameau*.

<sup>57</sup>In his 1977 study of the loss of **r** in the Parisian dialect, Laks (1977, p.116) observed various degrees of constriction present in the articulation of the variants [ʁ], [χ], [ʁ<sub>o</sub>], [Ø<sup>h</sup>], and [Ø]. Whereas [ʁ<sub>o</sub>] still manifests some constriction, [Ø<sup>h</sup>] does not, but only indicates a trace of **r** with a breathy sound similar to that of [h].

This indicates that phonetic variation of **r** appears to follow the general trend of historical sound change, at least with respect to the influence of linguistic context on **r**-processes. It should be noted, however, that in a “position faible” **r** was not automatically involved in a process of lenition. The only certain influence of a ‘weaker’ phonetic context is that it made the occurrence of an alternation between **r** and another sound more likely, regardless of whether this involved lenition or a process of another kind.

### **2.3 Global Versus Sporadic Sound Changes**

A comparison between the processes that represent global modification and those that represent mere sporadic examples of **r**-variation, clearly illustrates a certain inconsistency in the behaviour of the sound. While showing restraint where general consonant weakening is concerned, French **r** has, simultaneously, not only undergone continuous and repeated phonetic variation, but has done so with a great variety of other sounds. Thus, when considered within the French consonantal system, the phoneme **r** may be defined as a consonant of relative stability, but at the same time, also as a consonant whose behaviour is rather “unstable”. In part, it should be recognized that the velarization of front **r** to back **r** and the subsequent co-existence of these two variants contribute to the wide range of **r**-alternation. However, in order to clarify this paradoxical characterization of **r**, we recall that it has also been demonstrated that the wide range of “accidental” variation affecting the resonant occurred only temporarily, or occurs today within a limited geographical or social context. Thus, it is more accurate to state that, while restraint is accompanied by relative freedom, this freedom is characterized by a certain degree of moderation. The behaviour of **r** is therefore not as “unstable” as it might first appear to be.

### 3. Within the Framework of DP

Given the paradoxical behaviour of French **r**, we have chosen to focus on the particular nature of the sound to propose an explanation for its unique history. While other linguistic and external factors are not to be dismissed, we believe that an examination of the inherent phonetic characteristics of **r** provides an appropriate starting point.

In this chapter we examine the processes of **r**-variation within the framework of dependency phonology (DP). The first half of Chapter 3 provides the reader with a brief introduction to the study of non-linear phonology and presents an outline of the main theoretical and notational components of DP as well as the arguments for this model. We will concentrate specifically on the ranking of sounds within hierarchies of phonatory strength as well as ways of expressing the complexity of segments and processes. An examination of the segments' internal structure by means of the DP model of representation should provide some understanding of the apparently contradictory nature of **r**.

#### 3.1 Non-linear Phonology

An increased interest in and subsequent preoccupation with non-linear phonology among linguists began in the early 1970's<sup>1</sup>, partly as a result of various deficiencies

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<sup>1</sup>Charles Hockett had already alluded to the need for a less linear approach in his 1947 article entitled "Componential analysis of Sierra Popoluca" as quoted in Goldsmith (1990, p.8): "With the development of modern linguistics and the explicit formulation of the phonemic principle, this long-standing habit of visual representation has taken the shape of an unstated *linearity assumption*: the distinctive sound-units or phonemes of a language are building-blocks which occur in a row, never one on top of another or overlapping. This assumption has been lifted in certain patent cases: features of stress or tone, for example, which normally stretch over more than a single vowel or consonant, have been called *non-linear* or *suprasegmental* in contrast to the linear or segmental vowels and consonants... The point of view here assumed is, essentially, simply that of removing the linearity assumption from among our working principles."

attributed to the theory of generative phonology outlined by Chomsky and Halle (1968) in *The Sound Pattern of English (SPE)*. A renewed emphasis was placed on recognizing the syllable as a structural unit and using syllabic segmentation in the representation of phonological structure. In the framework of traditional generative phonology, phonological representations are displayed as minimal segments (comprised of unordered sets of binary distinctive features) which are grouped together to form a phonological word or phrase. This method of notation thus foregoes the use of syllables as phonological segments in the representation (Anderson & Durand, 1986, p.1). Anderson and Ewen (1980, p.16) remind us, however, that “the syllable is the domain...for the expression of the basic phonotactic constraints governing the distribution of segments”, and, as pointed out by Durand (1990, p.199), “specification of the phonotactics of a language can be extraordinarily complex without recourse to the syllable”. Another motivation for a non-linear representation was that in the *SPE* model the notation of stress or tone features was rather awkward and did not easily lend itself to a representation of suprasegmental structure, such as that of tone languages, for example. In generative phonology, where the syllable does not play a role, tone features are attributed directly to the vowel and interpreted as pitch. This manner of specification became problematic in the case of tone languages with contour tones and shifting tones.

Consequently, non-linear models of phonological representation allowing for a more adequate characterization of suprasegmental features were developed in the frameworks of autosegmental phonology, metrical phonology, and dependency phonology, among others. The term *non-linear* is used in opposition to standard generative phonology, the latter

involving a *linear* representation of sound-segments governed by rules which operate on this string-like arrangement (Durand, 1990, p.1). According to Goldsmith (1990, p.2), non-linear phonology has its background in classical generative phonology and is simply a continuation thereof<sup>2</sup>. The newer models of autosegmental and metrical phonology, however, allow for less abstract underlying phonological representations as well as a decrease in language-specific rule-ordering (Goldsmith, 1990, p.2).

Since these two models of non-linear representation lie outside the scope of our discussion we will limit ourselves to only a brief look at autosegmental and metrical phonology. We believe that it is beneficial for the reader to have an idea of some of the other non-linear models before being introduced to dependency phonology. In this way, the reader is provided with an overview of the field and given a point of departure within the context of non-linear phonology. A more detailed presentation of autosegmental phonology is found in Lieber (1987), of metrical phonology in Hogg and McCully (1987), and both are discussed by Goldsmith (1990), Durand (1990), and van der Hulst and Smith (1982).

Both autosegmental and metrical phonology were developed to deal specifically with suprasegmental phenomena, that is, the feature of tone and the distribution of stress respectively. The model of autosegmental phonology was later extended to account for phenomena of non-tonal languages. This first model proposes that the standard linear

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<sup>2</sup> "...the autosegmental and metrical models of phonological representation may best be viewed as a continuation of the generative theories of the *SPE* period. This is not because they sustain the conclusions, or even because they maintain the questions, of the halcyon days of *SPE* phonology; for they do not. It is rather that the original justifications for the theoretical changes in the model of phonology that led to autosegmental phonology and metrical phonology were based on arguments that made, and still make, perfect sense within the very theoretical heart of generative phonology."

representation be divided into several *autosegmental* tiers, each of which is comprised of a linear arrangement of segments. The segments in the different tiers are connected vertically by association lines to indicate how they are articulated simultaneously in time<sup>3</sup> (van der Hulst & Smith, 1982, p.3; Goldsmith, 1990, p.10). This representation of tiers may be compared to the score of a song, with the tonal tier being the melody and the segmental tier representing the text. Hence the name *autosegmental*, because the theory interprets tones as being autonomous segments within a phonological representation and not merely a feature of a particular sound-segment (van der Hulst & Smith, 1982, p.8). Metrical phonology is concerned with the phonological hierarchy, i.e. the organization of segments into syllables, syllables into feet, and feet into phonological words. Within the framework of metrical phonology, stress is viewed as a binary relation between two constituents and is expressed in the notation by specific labels: the constituents are represented by two nodes, one labelled *s*, meaning *stronger* or *dominant*, and the other labelled *w*, meaning *weaker* or *dependent*. Lines connecting the two nodes branch out to the various prosodic levels in the form of what is referred to as a metrical tree. Most often only the prominence relation is indicated since the prosodic constituents, such as feet or syllables, are implied in the representation (Durand, 1990, p.225).

### **3.2 Dependency Phonology**

#### **MOTIVATION FOR THE DP MODEL**

Although primarily considered to be a “notational proposal” by its formulators, DP

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<sup>3</sup>also referred to as co-registration or co-articulation

presents a new approach to phonological categorization and representation of segments and phonological processes in which the natural behaviour of phonological structure is reflected. The notion of 'dependency' refers to the relationship between the features characterizing a particular segment. In DP, it is this *dependency relation* which is regarded as the principal variable in a phonological representation (see p.65). According to Anderson and Ewen (1980, pp.10-11), dependency phonology does not represent an alternative to phonological theories such as generative phonology but rather to other models of phonological *representation* like those of distinctive feature phonology, for example (as well as autosegmental and metrical phonology).

The primary motivation behind DP is the conviction that there is a need for greater componentiality in phonological theory, which may be achieved by recognizing that phonological segments have an internal structure which should be reflected in their representation. In other words, a notational system must not only adequately represent the recurrence of phonological classes, but also show the phonetic basis for these natural classes (Anderson & Ewen, 1980, p.13). Frequently occurring segments and processes should be represented by a simpler notation than those which are irregular and occur only sporadically, i.e. ones which do not manifest natural recurrence (Durand & Anderson, 1986, p.7; Anderson & Ewen, 1987, p.9). The notion of greater componentiality is based on the assumption that a) "classes of phonological segments are not random" and b) "phonological classes and the regularities into which they enter have a phonetic basis" (Anderson & Ewen, 1987, p.8).

Thus, unlike autosegmental and metrical phonology, which were initially developed

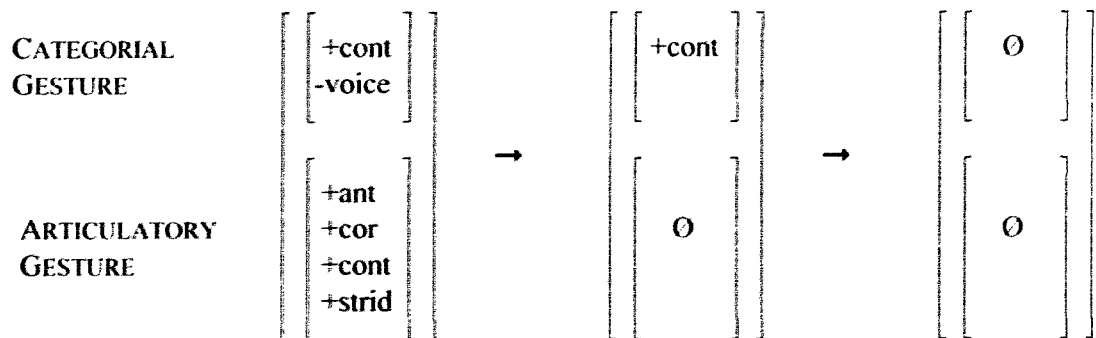


to deal with suprasegmental structure, dependency phonology provides for an even more “richly articulated” representation of, in particular, the internal structure of segments. Indeed, we may consider the autosegmental and metrical models as forerunners of dependency phonology in the sense that the idea of gestures or tiers was already established in the first two frameworks, yet only in DP were these concepts shown to have a phonological basis as well as being supported by phonetic evidence. In order to achieve greater componentiality, i.e. a ‘more richly articulated representation’, Anderson and Ewen (1980, p.11) propose “two different kinds of increase in the complexity which should be attributed to the internal structure of segments”.

The first kind of increase constitutes a matrix of features, characterizing a particular segment, which is divided into subsets (or gestures). The term *gesture* is already found in the work of Lass (1976, p.153), who, on the subject of phonological description, notes that “there are two articulatory configurations, one laryngeal and the other supralaryngeal”. Based on this point of view, he suggests that all segments may be represented by two gestures, one holding relevant information about the ‘phonation’ or ‘category’ and the other about the ‘location’ (i.e. articulatory characteristics) of the sound. Chomsky and Halle (1968) had previously also alluded to the idea of sub-groupings with their informal use of terms such as ‘major class features’. It is only within the framework of DP, however, that the notion of sub-groupings or gestures has been formalised and is considered as “basic to [the] concept of segmental structure” (Anderson & Ewen, 1987, p.35). Support for a formal incorporation of gestures in the phonological framework is in part based on phonetic

evidence of the various aspects of speech-sounds as discussed in the works of Ladefoged<sup>4</sup> and Catford<sup>5</sup>, who each propose a set of components or processes involved in the production of speech. Anderson and Ewen (1987, p.150) thus present a matrix comprised of two phonological gestures, the Categorical Gesture and the Articulatory Gesture. The first of these includes features relating to phonation and initiation, that is, the presence or absence of vocal cord vibration and the movement of the glottis (e.g. voice, continuancy, sonorance, glottal stricture, etc.). The second includes features referring to locational aspects of articulation, such as place, height, rounding, backness, and nasality. Further justification for a formal incorporation of gestures into the phonological framework finds support in the fact that “specific sub-groupings of features are involved in phonological processes” (Anderson & Ewen, 1987, p.36). A commonly cited example by DP formulators, as well as by Lass (1976, p.153), is a process of lenition involving the reduction of a voiceless fricative [s]:

3.1) *Gesture representation of the process [s] > [h] > [∅]*



(Durand & Anderson, 1986, pp.22-23)

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<sup>4</sup>Ladefoged, P., (1971). *Preliminaries to linguistic phonetics*. Chicago: Chicago University Press, pp.2-3. (cited in Anderson & Ewen, 1987, p.303).

<sup>5</sup>Catford, J.C.. (1977). *Fundamental problems in phonetics*. Edinburgh: Edinburgh University Press, pp.15-16. (cited in Anderson & Ewen, 1987, p.299).

With the use of gestures, the process [s] → [h] → [Ø], represented in 3.1), shows an unspecified articulatory gesture for the segment [h], while complete loss of the fricative is represented as having both gestures unspecified.

The second type of increase in complexity operates on a deeper level in the form of a specification of the relation between these features, or components, as they are referred to in DP. In the following brief definition of the dependency components specifying the segments within each of the gestures, we limit our discussion to the categorial gesture, because it not only deals specifically with the notion of phonatory weakness and strength of segment-types but also addresses the aspect of phonological complexity (discussed in detail in Sections 3.3 and 3.4 below). As we shall see, it therefore lends itself to an analysis of r-variation as processes of lenition or strengthening as well as to an analysis of the complexity of the various sound-segments discussed in Chapter 2 above<sup>6</sup>.

Rejecting the use of binary features<sup>7</sup> as well as a multi-valued or scalar system<sup>8</sup>, the

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<sup>6</sup>It should be noted that the initiatory features lie outside our domain as they pertain to languages with a three-way opposition in phonation and aspects such as creaky voice, breathy voice, etc.. Furthermore, a proper examination of the articulatory gesture is not feasible at this point for various reasons. The representation of segments within the articulatory gesture entails a relatively large number of components, unlike the categorial gesture, and, therefore, requires a much more detailed introduction to the method of notation. Given our limitations with respect to space and the range of the subject matter here, only a brief presentation of the main articulatory aspects would be possible at this point, which certainly would not do justice to this very significant aspect of r-variation. Moreover, it should be noted that where the articulatory gesture is concerned, developments within dependency phonology have been made especially in the definition of the vowel space whereas the representation of consonants is still under much discussion. We recognize that an examination of the articulatory features of r as well as of the other sounds discussed here constitutes a significant aspect of the various r-processes. We, therefore, propose that our study of r (in terms of categorial components) represents only the beginning of an examination of r-variation within the framework of DP.

<sup>7</sup>Durand and Anderson (1986, p.23) describe the two values + and - as simply being "two facets of a single characteristic" of a feature and consider binarity as restrictive in the representation of prosodic features and as particularly inappropriate in the expression of natural classes (a natural

formulators of the dependency model have opted for features of a single or *unary* value. Consequently, by eliminating the possibility of variation in the feature, the *relation* between the features themselves remains as the only variable (Anderson & Ewen, 1987, p.28). In the categorial gesture the two components V and C are used to represent the aspects of consonantality, voice, continuance, and sonorance. The component V is defined as “relatively periodic” while C is considered to be a component of “periodic energy reduction”, and although both components are related to the phonetic features [vocalic] and [consonantal], it is important to note that they are not binary. Having only one value, V or C may appear alone or in a *dependency* relation with each other (Durand & Anderson, 1986, p.34; Anderson & Ewen, 1987, p.151; Durand, 1990, p.298). The vowel [u], for example, is represented by a single V, while a voiceless plosive like [t] is represented by a single C. A voiceless fricative such as [s], which is stronger than [u] yet weaker than [t] in terms of articulatory strength, is represented by both V and C, indicating a relation between the degree of “vocalicness” and “consonanticity”. One could also interpret [s] as being acoustically weaker than [u] and acoustically stronger than [t]. Thus, the components V and C alone represent two end points of a continuum that ranges from ultimate ‘consonantal’ or articulatory strength to ultimate ‘vocalic’ or acoustic strength, and on which various types of

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class is defined as a group of feature-sharing segments which are more conveniently specified as a class than as individual segments).

<sup>8</sup>The multi-valued or scalar system of representation, proposed as a remedy to some of the problems encountered with binary features, is also deemed unsatisfactory because the number of steps along the scale and the labelling of these steps is arbitrary. Added to this is the fact that a scalar representation does not replace the binary feature representation but is only there to complement it. (For a brief summary of phonological scales and scalar features please refer to Anderson & Ewen, 1987, pp.19-27).

component combinations are placed. Thus, [u] is placed at the V-end, [t] at the C-end, and [s], represented by the notation V:C, at the mid-point on the continuum, the colon indicating a relation of equal dependency between the two components.

For the purpose of this examination of French *r* a comprehensive understanding of the notational system of DP is not necessary. We therefore make use of only the V and C components in our notation and adopt the idea of C-ness and V-ness as referring to increasing articulatory and acoustic strength respectively. The sound-segments discussed in Chapter 2 are thus represented by the following categorial gesture components as presented within the DP framework:

### 3.2) *representation of categorial components*

V	V→V:C	V→V:C→C
u	r, R	l, ʎ, †
V→C	V:C↔V	V:C→V
n	z	ð, ʙ
	V:C→C	C→V
	x, h	d

The relation between the components is indicated by either a colon (:) or an arrow (→), the former indicating a relation of mutual dependency, the latter expressing a relation in which one component dominates the other. The categorial gesture of the voiced stop [d], for example, is represented by a C-component governing an additional V-component, where C indicates that the segment is a plosive, and V characterizes the slightly more vocalic nature

of [d] as opposed to [t] by demonstrating that the former is voiced<sup>9</sup>. The symbol  $\leftrightarrow$ , which is used in the representation for [z], marks this segment as a sibilant fricative as opposed to a non-sibilant fricative<sup>10</sup>. The two-way arrow places C in a mutually dependent relation with V and thus indicates that [z] is more 'vocalic' than [ð] and [ʒ]. Within the DP model, the bi-directional arrow is seen as reflecting a higher degree of complexity than the unilateral arrow. Although  $\leftrightarrow$  denotes symmetrical instead of asymmetrical dependency and is therefore equivalent to the colon (which also characterizes mutually dependent components), it appears to be used only in cases where the colon is already representing a relation of mutual dependency between two components and a further distinction between two segments is necessary, thus calling for greater complexity in the representation<sup>11</sup>.

The sonorant consonants, considered to be intermediary sounds between vowels and

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<sup>9</sup>Within the categorial gesture the symbol V represents voicing, the phonatory component common to all vowels and shared by certain consonants. (Vowels, whose categorial gesture is represented in every case by a single V, are differentiated only in the representation of the *articulatory gesture*.)

<sup>10</sup>Sibilants are said to differ slightly in increased noise intensity from non-sibilant fricatives, hence the denomination of *sibilant* for z and s. This distinction between sibilant and non-sibilant obstruents is considered by Anderson and Ewen (1987, p.165) to be of enough significance to require a refined representation for the former within the categorial gesture: "...Phonetically, sibilants display a spectrum with virtually no damping, while the non-sibilants show considerably greater energy reduction, realised as zeros. Sibilants, then, are optimally 'strident'...[and] although they are obstruents, they display the lowest possible preponderance of consonantal feature...that is, they are most vowel-like fricatives...Hence we can view the sibilants, rather than the fricatives in general, as representing the simplest possible combination of the |V| and |C| components in this area... .

<sup>11</sup>Anderson and Ewen (1987, p.160), for example, use the symbol to distinguish the fricative trill from the lateral liquid and the voiced fricatives, i.e.  $V:C \rightarrow V$  for [ð],  $V:C \leftrightarrow V$  for [ʒ], and  $V \rightarrow V:C$  for [l], explaining that "the inherent complexity of a system utilising [the symbol  $\leftrightarrow$ ] is brought out by the need to invoke both symmetric and asymmetric dependency in relation to the complex node, thus giving a three-way hierarchical opposition involving a V node and a V:C node, and two occurrences of symmetric dependency...- both within the complex V:C node, and between it and the V node".

consonants, are also represented by a combination of the V- and C-components. In this case, the governing position of V over C accurately reflects the fact that sonorant consonants have “a clearly marked formant structure” (Anderson & Ewen, 1987, p.152). While nasals are represented with the V-component immediately governing the C-component, for the slightly more vocalic liquids the V-component governs an additional V<sup>12</sup>. A further distinction is made between lateral and non-lateral liquids, marked by an additional C-component in the representation of **l**, the latter considered to be slightly more consonantal than **r**<sup>13</sup>. The opposition of voiced versus voiceless segments is indicated with an additional V component in the representation of the voiced segment, as for example in the case of the voiced fricatives [z, ð, ʒ] (Anderson & Ewen, 1987, pp.155-157). The notion of a V-C continuum then, not only gives a sense of gradual opposition between increasing V-ness and decreasing C-ness or vice versa, but at the same time reflects the different kinds of oppositions that exist between the individual segment-types.

The specific focus on phonological strength and complexity within dependency phonology provides an appropriate framework for our examination of French **r**, primarily because the model is able to more adequately handle the phenomenon of lenition, which is not necessarily always adequately represented by a binary feature system (Anderson &

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<sup>12</sup>Anderson and Ewen (1987, p.162) note that “Ó Dochartaigh [(1978)] observes that there is phonological evidence from Gaelic to suggest that /l/ is more vocalic than /n/...”.

<sup>13</sup>Anderson and Ewen (1987, p.162) deem non-lateral liquids like [r] and [ʀ] to be more vocalic in nature, based on the evidence that in Scottish Gaelic dialects **r** seems to invoke vowel lengthening while **l** does not. Findings of this kind were also made by Ó Dochartaigh [(1978)] in his study of the “Phonology of the Gaelic Liquids” (cited in Anderson & Ewen, 1987, p.304). Ó Dochartaigh found that “only the non-lateral liquid could be associated with lengthening of the vowel”, leading him to suggest “that /r/ has a higher ‘relative vocalicness’ than /l/ and /n/” (Anderson & Ewen, 1987, p.162).

Ewen, 1980, p.17). The various processes French *r* has undergone, including those of *r*-alternation, may very well be interpreted as processes of weakening or strengthening. In his article entitled “A dependency approach to some well-known features of historical English phonology”, C. Jones<sup>14</sup> notes that dependency phonology was partly developed out of the need for a more satisfactory way of describing and explaining historical phonological change. We thus hope that an application of the DP model to an examination of *r*-variation processes in French will shed new light, not only on the behaviour of the sound during its evolution but also on the nature of French *r* in general<sup>15</sup>.

### **3.3 Phonological Hierarchisation of Segments**

As noted above, the idea of a hierarchisation of segments in terms of categorial features is of particular significance to our examination of the processes affecting French *r*. Evidence for these hierarchies is based on the historical behaviour of segments undergoing a sound change (Anderson & Ewen, 1987, p.171), such as the lenition processes affecting obstruents, for example. Lass and Anderson (1975, p.150) had already noted in an earlier work that “[t]here are certain sequences of change that tend to repeat themselves again and again in the histories of languages”, and had demonstrated how processes of lenition, in particular, offer a basis for the hierarchisation of sound-segments according to their

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<sup>14</sup>cited in Durand & Anderson, 1986, p.257

<sup>15</sup>Although the DP model also offers an adequate representation of supra-segmental structure, we will not be concerned with this aspect, again given the topic of our study. For an overview of the representation of suprasegmental structure within the DP framework we suggest Anderson and Durand (1986, pp.3-19) or Durand (1990, ch. 8), while a more detailed discussion may be found in Anderson and Ewen (1987, chs. 2-3, pp.41-125).



articulatory resistance. A number of other studies<sup>16</sup> have also presented various phonological processes as evidence for such hierarchies.

The notion of ranking segment-types in terms of *phonetic strength* has received, among other models and points of view<sup>17</sup>, considerable attention in dependency phonology. Anderson and Ewen view a formal incorporation of strength hierarchies within the DP model as essential to the recognition of the natural recurrence of phonological processes, that is, as support for the phonetic basis of the DP system of representation, specifically with respect to the V-C continuum. In other words, the notion of phonological hierarchies is explored in an effort to demonstrate the “naturalness” of a particular process (for a detailed discussion of *naturalness* in DP see 3.4.2 below). The type of hierarchy we are concerned with here imposes a ranking of the various segment-types according to the articulatory strength of a sound.

Straka (1964, pp.19-20), although not concerned directly with the issue of phonological hierarchies, suggests a “classement” of consonants according to the degree of closure of the vocal tract, which is determined by the amount of articulatory energy expended. He establishes a ranking of the various categories of phonatory and articulatory aspects of consonants presented in 3.3) below. With respect to fricatives and liquids, Straka claims that it is difficult to identify the varying degrees of expended energy in these two categories, making it therefore impossible to rank these sound-segments in terms of

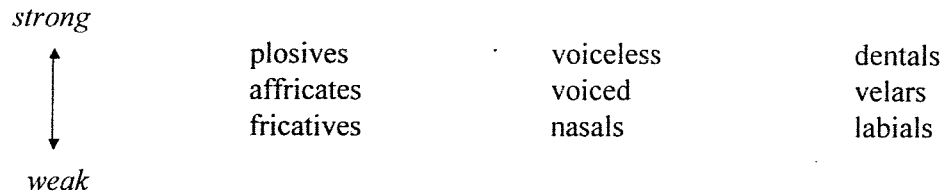
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<sup>16</sup>See Anderson & Ewen (1987, p.172) for references of studies by Taylor, Zwicky, and Hankamer & Aissen.

<sup>17</sup>See Anderson & Ewen (1987, pp.171-173) for references of Vennemann, Ladefoged & Vennemann, Ladefoged, Hooper, Escure, Foley, Williamson, Drachman, and Kiparsky.

articulatory strength. As for the difference between vowels and consonants, however, he claims that the output of articulatory energy for vowels is certainly inferior to that of the consonants, the latter involving the use of the stronger “*muscles éleveurs*” as opposed to the weaker “*abaisseurs*”, which are used in the realization of vowels.

### 3.3) *Phonatory ranking proposed by Straka (1964)*



Lass and Anderson (1975, pp.150-159) propose a hierarchy of phonological ranking based on sequences of sound change found to be common in the evolution of languages:

### 3.4) *Hierarchy of phonological ranking proposed by Lass and Anderson (1975)*

- |  |  |
|--|--|
| <p>I. a) (intervocalic) voiceless stop<br/>         b) voiceless stop → voiced<br/>         c) voiced stop → voiced fricative<br/>         d) voiced fricative → approximant<br/>         e) approximant → vowel<br/>         f) vowel → Ø</p> | <p>II. a) (word-initial) voiceless stop<br/>         b) voiceless stop → aspirated stop/affricate<br/>         c) aspirate/affricate → voiceless fricative<br/>         d) voiceless fricative → h<br/>         e) h → Ø</p> |
|--|--|

Lass and Anderson (1975, pp.153-154) point out that this hierarchisation, which represents a schematization of “certain sequences of change”, is not based on the assumption that all sound change is gradual:

We do not claim a necessary stepwise progression through a series like [3.4)] for any segment in any language (though it is of course possible). What we are doing is setting up the degrees of the weakening scale, without claiming that any particular lenition must pass through all the phases.

Although similar to Straka's (1964) criteria for ranking sound-segments, Lass and Anderson (1975) define phonetic strength from a different perspective, namely by considering the result of the realization (as opposed to the production of the articulatory movement, proposed by Straka (see p.70)). The notion of strength in this case is equated with "resistance to airflow through the vocal tract", i.e. "the more the airstream is impeded in the production of a segment, the greater its strength" (Lass & Anderson, 1975, p.151). Apart from the openness of stricture, the degree of sonority (or lack thereof) is also a measure of strength, in the sense that voicing of a segment means weakening, as is demonstrated in the first sequence of 3.4). It can therefore be said that a lower resistance to airflow translates into an increased output of acoustic energy.

Another way of interpreting the notion of strength is as a resistance to lenition, whereby a stronger segment like a plosive is more likely to resist lenition than a fricative, for example. This, in turn, calls for the consideration of linguistic context, that is, which type of linguistic environment acts as a kind of protection for a weaker segment more susceptible to lenition. Lass and Anderson (1975, p.162) suggest that, while the intervocalic position is the "preferred lenition environment", a neighbouring consonantal segment (i.e. any segment ranked above a vowel) will offer the "endangered" segment protection against further or maximal weakening. The fact that lenition is more likely to occur intervocalically is explained as an assimilatory response, whereby the features of the affected segment assimilate to those of the surrounding vowels, i.e. [+voice] and [+cont]<sup>12</sup>.

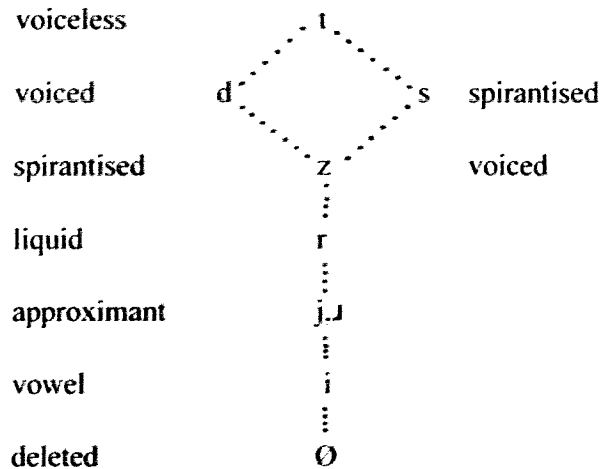
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<sup>12</sup>-That is, any less than maximally weak segment in a weakening environment will have a tendency to alter the type of weakening, i.e. to prevent descent down either the opening or sonorization scale from going as far as it would go under 'ideal' conditions. And this suggests that

These two features are thus seen as characterizing weakening in obstruents.

The hierarchy of phonological ranking proposed by Lass and Anderson (1975), presented above in 3.4), is placed into the context of dependency phonology as a combination of the two sequences of sound change (Anderson & Ewen, 1987, p.175):

### 3.5) *Hierarchy of phonological ranking proposed by Anderson and Ewen (1987)*



Both types of lenition are presented by Anderson and Ewen. The first, which involves sonorization (t > d > z...), is linked with the second, which involves opening (t > s > z...). Only step d) of the second sequence in 3.4), that is, the weakening of a voiceless fricative to h, is omitted<sup>19</sup>. This hierarchy, ranking from voiceless stops as the strongest segment-type to vowels as the lowest (before deletion), can be viewed as parallel to the continuum between the phonatory components C and V in the categorial gesture of the DP model. A hierarchy of strength using the proposed system of DP notation is represented as follows

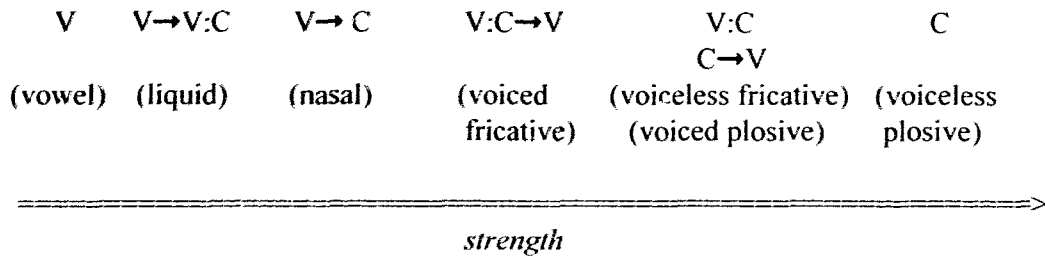
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we have to define ‘strength’ not only in absolute (resistance to airflow) terms, but in terms of power to induce assimilation...”(Lass & Anderson, 1975, p.164)

<sup>19</sup>This process is discussed on p.82 below.

(Anderson & Ewen, 1987, p.174):

3.6) *Hierarchy of phonatory strength in DP proposed by Anderson and Ewen (1987)*



Thus, within the framework of dependency phonology, lenition is simply an increase in V-ness and a decrease in C-ness. or, as stated by Ewen (1977, p.320) "a change in the direction of V".

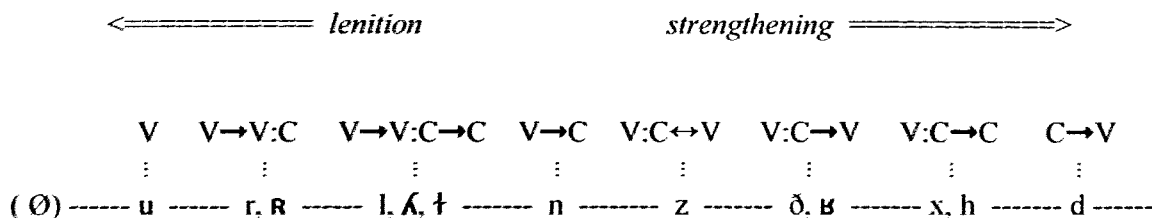
As pointed out by the formulators of dependency phonology, the notion of phonological hierarchisation in terms of a segment's articulatory strength has been explored in DP in order to reflect the phonetic basis for this particular system of representation. In the examination of French *r* the DP model provides another perspective on the resonant's historical behaviour and a new approach to the interpretation of this behaviour.

**3.3.1 Processes of r-variation Within Strength Hierarchies**

When considering the various processes of r-variation in terms of phonological strength hierarchies it becomes evident that French *r* has not simply undergone lenition, as in the case of lost *r*, but that certain processes, particularly *r*'s alternation with other sounds in the language, represent either strengthening or neither of the two, that is, no increase in C-ness nor V-ness. As a point of departure to this approach on *r*-processes, we have mapped the sound-segments involved onto the V-C continuum, using both phonetic symbols

as well as the DP notation presented in 3.2) above (see p.66):

3.7) *r-processes on the V-C continuum*



The representation in 3.7) provides an overview of the place of each sound-segment in relation to the others on the V-C continuum. Thus, in terms of articulatory strength, the dental plosive [d] is considered as the strongest segment and the vowel [u] as the weakest. A brief look at the DP representations of the various segment-types also gives a general conception as to the 'vocalic' or 'consonantal' nature of each sound-segment, again specifically in relation to a neighbouring segment on the continuum. The two liquid *r*-variants, for example, are represented by two V components and one C whereas the voiceless fricatives are characterized by two C components and one V, which can be simply interpreted as meaning that [r,R] are more V-like (or less C-like) than [x,h]. When considering two segment-types adjacent to each other, the relation between the components needs to be taken into account. The fact that [n] is more V-like (i.e. closer to the V-end of the continuum) than [z] is represented by the arrow indicating that V governs C, that is, V-ness dominates over C-ness. For [z], the relation between V and C is one of equal dependency indicated by the colon (the second V component only playing a role in the sibilant's opposition to the non-sibilant fricatives [ð,ʙ]). In terms of linguistic change, the representation in 3.7) demonstrates how a change which involves a move towards V or an

alternation with a more 'vocalic' segment-type is a process of lenition, while a move in the opposite direction (towards C) or an alternation with a more 'consonantal' segment-type is a process of strengthening. The various *r*-processes, summarized in the tables 2.4) and 2.7) of Chapter 2, can be assigned to four categories according to the type of movement on the V-C continuum representing the change: 1) a process of lenition, 2) a process of strengthening, 3) a process consecutively involving lenition *and* strengthening (not necessarily in that order), 4) a process involving no overall shift.

### *r* > *R*

Beginning with the *r* > *R* process, it is the fourth category above which needs to be considered first. The change from front *r* to back *r* is the only process involving *no overall shift* on the V-C continuum in the categorial gesture, the only modification constituting a change in the place of articulation from apical to uvular trill. The fact that neither weakening nor strengthening took place is significant, given that this process also represents the only permanent change for *r* during its evolution. As noted in 2.2.1, among the many diverging accounts of how and why front *r* became back *r*, only two statements can be made unequivocally: first, that change did occur, very likely beginning in Old French and reaching full momentum in late Middle French and early Modern French; second, in the twentieth century the fricative variant [ʁ] is gaining ground over the trilled variant [ʀ] in many Francophone regions around the world.

At the same time it is interesting to note that almost all explanations for the *r* > *R* process presented in 2.1.1 (whether it be a direct change from *r* > *R* or a process involving an intermediary assibilated *r*) imply a degree of weakening in the replacement of the front

**r**-variant with uvular **r**. The strength hierarchy and the V-C continuum show this to be an incorrect assumption, however. If an intermediary [z] or [ð] were involved in the process, it could only be interpreted as a process of strengthening, the continuum in 3.7) clearly showing the interdental and sibilant fricatives in closer proximity to the C-end than **r**. Only the most recent **r**-variant [ʁ] demonstrates with certainty a strengthened articulation of **r**, that is, a more consonantal realization which indicates a process of strengthening (*not* lenition). Therefore, the only type of 'weakening' characterizing the realization of **r** in contemporary French is a reduction in the level of acoustic energy, since less vocalicness is equal to an increase in consonanticity.

### ***Loss of r***

The loss of **r** constitutes, without question, a process of lenition, which is marked by a *loss* of articulatory strength in the alternation between two sounds. However, as in the case of  $r > R$ , the interpretation of assibilated **r** as an intermediary *weakened* stage of the resonant in the process from **r** to  $\emptyset$  is false. Such a process ( $r > Z > \emptyset$ ), when mapped onto the continuum, clearly shows an initial strengthening, that is, a move towards C before a shift is made in the opposite direction towards V. If assibilation did play an intermediary role in the overall process of  $r > \emptyset$ , loss of **r** would fall into the third category, a process involving consecutive strengthening and lenition.

### ***r-alternation***

The various processes involving the alternation of **r** with another phoneme fall into the first three of the categories:



### 3.8) Processes of lenition<sup>20</sup>

[l] > r      [z] > r      [d] > r      [ʎ] > r      [n] > r  
[ʈ] > R      [x] > R      R > [u]

All of the alternations in 3.8), with the exception of the last one, involve a change from either a lateral or non-liquid to **r**. Since these sound-segments are situated closer to the C-end on the continuum in relation to **r**, each change represents a weakening. In the case of the process from **R** to **u**, this change begins with **r** itself and moves even closer to the V-end since [u], as a vowel, is characterized as weaker in terms of articulatory strength than the resonant **r**. On the other hand, vocalization of **r** as well as the other processes of 3.8) all represent strengthening where acoustic energy is concerned.

### 3.9) Processes of strengthening

r > [d]      r > [l]      r > Z      [R] > [ʁ]

This type of change is a reversal of the process of lenition in that it is marked by an *increase* in articulatory strength from one sound to the next, that is, the result is a more consonantal segment. In all cases of 3.9) the process involves a change *from* **r** to something other than a liquid trill. A consideration of the processes presented in both categories of 3.8) and 3.9) makes it clear that alternations of the type **r** > [...] may represent either lenition or strengthening. In other words, **r** is either weakened or strengthened to another sound, although more frequently strengthened since the vocalization of **r** presents the only example

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<sup>20</sup>The process **r** > Ø is discussed on p.98 below.

of **r** weakening to another sound. Thus, **r** pronounced as [z] or the recent fricativization of uvular **r** represent strengthening because in both cases the change involves a move in the direction of the C-end of the continuum towards a sound-segment of greater articulatory strength. The vocalization of **r** involves weakening, representing a move towards the V-end to a sound of lesser articulatory strength. In the case of an alternation such as [...] > **r** only strengthening, i.e. a shift towards C, occurs.

In assigning the **r**-processes of 3.9) to the category of processes of strengthening (in accordance with the DP definition of phonological strength) it becomes apparent that the DP interpretation of these **r**-changes conflicts with the more traditional accounts presented in Chapter 2. As already pointed out above in the case of loss of **r**, the process **r** > Z, when mapped onto the DP continuum, demonstrates that a change from a liquid to a voiced fricative constitutes a move towards increased consonantality or a stronger articulation, and therefore represents a process of strengthening. According to traditional interpretations, however, the assibilation of **r** is a process of lenition, a point of view held by, among others, Straka (see p.43), who also regards the change from **r** to **l** as articulatory weakening. This traditional view appears to be based partly on the idea that producing a trill is physically more strenuous than realizing a fricative or a lateral. It is true that *acoustically* a trill is 'stronger' than [z], [ð], or even [l], its formant pattern indicating a higher level of vocalicness. However, as already noted (see p.72 above), this *acoustic strength* translates into a reduced resistance to airflow, that is, a *lower* output of articulatory energy. The definition of "physically strenuous" thus requires clarification. A factor which further complicates the issue is that assibilation occurred primarily in intervocalic position, which

is, as said before, the preferred environment for weakening according to the lenition hierarchy proposed by Lass and Anderson (1975) (see 3.4). We return to this issue later on in our discussion (see 3.4).

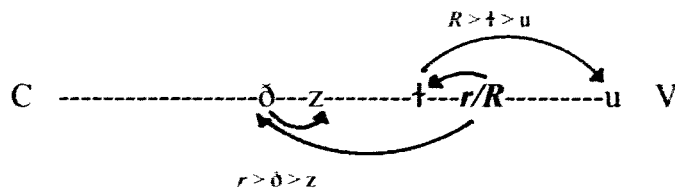
The third category, *processes involving lenition and strengthening*, includes two processes already seen in the two previous categories respectively, namely vocalization and assibilation of **r**. Both of these processes are also shown to have occurred via an intermediary sound:

### 3.10) *Processes involving lenition and strengthening*

$R > \dagger > u$                        $r > \delta > z$

On the continuum we might represent these two processes in the following manner:

### 3.11) *Processes $R > \dagger > u$ and $r > \delta > z$*



In the case of vocalization, the overall process is one of lenition. The change begins, however, with an initial stage of strengthening from back **r** to the velar lateral, which is subsequently followed by weakening. This second stage is characterized by a reversal of direction in the process, involving a move backwards past its starting point (**r**) before ending in the back vowel **u**. The assibilation of **r** is represented by the same sequence of movements, first strengthening followed by lenition. In the latter case, however, the net

result is one of strengthening relative to the original sound (r), although the final stage is one of weakening. A more simple explanation may be offered with the help of the arrows in 3.11), whereby the long arrow is seen as always representing the net result of the process.

Despite a posited intermediary sound in these processes, it is not certain that the changes actually occurred in such a way. Eurén, for example, suggests that r was vocalized via an intermediary l-sound, based on the observation that the word *arbre* existed not only as *aubre* but also as *albre* (see p.41), thus allowing for the following sequence of *arbre* > *albre* > *aubre*. The form *albre*, however, may simply be a result of r-alternation with velarized l, a process which occurred at the same time, according to Wolff (see p.41 above). This would mean that the liquids in the forms *arbre* and *albre* underwent vocalization separately, both of which involve a process of lenition.

In the case of assibilated r, the positing of an intermediary interdental fricative appears to be based on the seemingly logical supposition that when the trilling action is removed from the realization of trilled front r the result is a sound resembling [ð]. This hypothesis is supported by the fact that the fricative was found to replace r in certain dialects, as observed in studies done in the nineteenth and twentieth centuries. The issue of complexity, discussed below in 3.4, offers a reasonable explanation as to why the assibilation of r was interpreted this way. For the moment, we simply note that it seems more likely that r alternated directly with [z] or [ð] (or a sound closely resembling these two sound-segments) and/or that the two fricatives themselves alternated with each other.

One process we have not yet dealt with is the alternation of back r with the sound h. Ladefoged (1975, p.62) simply describes [h] as “the voiceless counterpart of the following

sound” (usually a vowel) while Catford (1988, p.43) views the realization of [h] as “unarticulated voiceless initiation”, that is, the result after removing phonation and articulation from a voiced fricative. Lass and Anderson (1975, p.152) more precisely assume that [h] “represents the minimal ‘unarticulated’ fricative, i.e. the step between a fricative with full supraglottal articulation and zero”. Lass (1984, p.179) observes that in many languages today the sound can be traced back to the lenition of other obstruents, for example, Latin /h/ comes from earlier /g/, Germanic /h/ from /x/ which stems from Indo-European /k/. Although Catford alludes to the aspect of initiation as being separate from phonation in his description of [h], Anderson and Ewen (1987, pp.145-146) consider components of both phonation and initiation as belonging to the categorial gesture, the presence or absence of voice (or vocal cord vibration) being part of the phonatory subgesture and the *degree* of voicing (or of glottal stricture) part of the initiatory subgesture. Given its status as a voiceless fricative, our DP representation  $V:C \rightarrow C$  of [h] remains valid since we are only concerned with the phonatory components in the categorial gesture.

What complicates matters is the fact that in the articulatory gesture, [h], as the so-called ‘minimal’ fricative, is characterized by zero components, while *r*, as well as every other sound involved in *r*-alternation, is characterized by features in both gestures, as shown in 3.12) below<sup>21</sup>. Therefore, can a liquid, represented as having articulatory components, still be considered as ‘weaker’ than the minimal fricative [h] when strength is defined as articulatory resistance?

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<sup>21</sup>This does not include [Ø], which holds zero features in both the articulatory and categorial gesture.

### 3.12) *Gesture representation of r and h*

	<b>r</b>		<b>h</b>
CATEGORIAL GESTURE	$\left[ \begin{array}{c} +\text{voc} \\ +\text{cons} \end{array} \right]$		$\left[ \begin{array}{c} -\text{voc} \\ +\text{cons} \end{array} \right]$
ARTICULATORY GESTURE	$\left[ \begin{array}{c} +\text{back} \\ +\text{high} \end{array} \right]$		$\left[ \begin{array}{c} \emptyset \end{array} \right]$

An important point to remember here is that, in dependency phonology, the notion of hierarchies is presented within the *categorical* gesture and does not involve any hierarchical ranking in terms of place of articulation, even though the presence of articulatory components in the characterization of a segment certainly implies a higher degree of resistance to airflow than does a lack of all articulatory components. At least in the case of consonants, the possibility of defining a place of constriction for a particular segment indicates that there is at least *some* closure in the vocal tract. For the sound [h] there is no constriction, however.

According to the processes of lenition proposed by Lass and Anderson in 3.4), [h] only occurs in the process involving opening (e.g. t > s > ...h), which, incidentally, only extends down to the rank of fricatives (since liquids, approximants, and vowels “do not have any distinct closure and release” (Lass & Anderson, 1975, p.157)). As we saw above, Anderson and Ewen (1987, p.175), by condensing the two processes of 3.4) into one single representation in 3.5), omitted this particular stage of lenition whereby a voiceless fricative undergoes weakening of closure and results in [h]. The reason for this is that the step does not involve a change within the categorical gesture but rather the *deletion* of the articulatory

gesture.

Since the sequence of change in 3.5) represents the two basic processes of weakening observed in the history of languages, we suggest that in the case of **r**-alternation with **h**, a voiceless fricative was involved as an intermediary sound linking **r** and **h** to what appears to be an alternation between the two. We have established that the **r**-variant in question is a back **r**, which has also been found to alternate with the voiceless velar fricative [x] (see p.51, fn.57). With respect to Falc'hun's (1972) suggestion that **h** changed to **r**, it is our assumption that the initial segment was in fact a voiceless velar fricative which weakened either via sonorization to *R* or via de-articulation (or defricativization) to [h]. In contemporary French, Laks (1977) observed that while certain Parisian **r**-variants resembled [h], a realization of [x] was also among the variants (see p.52, fn.58). Furthermore, according to Léon's (1967) observations, the confusion between back **r** and **h** in the Cotentin dialect often results in an intermediary fricative (see p.51, fn.57). The process **h** > **r** thus constitutes another process of weakening.

The above examination of **r**-processes in terms of phonological strength hierarchies has demonstrated how the resonant has been involved in a variety of different processes, involving either lenition and/or strengthening, or no shift at all on the continuum. As an overview of *when* lenition or strengthening of **r** took place during the evolution of the phoneme, the tables 2.4) and 2.7) of Chapter 2 are combined into the table below (13.3)), this time with each process replaced by a symbol indicating either a process of lenition or a process of strengthening:

3.13) *Tabular summary of lenition and strengthening processes*

	PRE-ROMANCE	GALLO-ROMANCE	OLD FRENCH		MIDDLE FRENCH			MODERN FRENCH				
		5TH	9TH	12TH	13TH	14TH	15TH	16TH	17TH	18TH	19TH	20TH
#_				○								●
C_	○	●		● ○			● (●)	● →				●
V_V		●		● ○		● →	● →		● →			●
_C		●		○ ● ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○
_#	○			○			○ ○	○ ○				○ ○

- - process of lenition (a shift towards V)
- - process of strengthening (a shift towards C)
- - bi-directional r-alternation with another sound (i.e. both lenition & strengthening)
- ( ) - a first occurrence of that process

Most of the lenition processes of the type [...] > r, such as n > r, l > r, z > r for example, as well as the loss of r are represented by an empty circle, ○. Assibilation of r and other processes of strengthening, such as r > l and r > d are represented by a full circle, ●, while the symbol ● represents cases such as concurrent l > r and r > l or Z > r and r > z. The permanent change from front r to back r has not been included in this representation since it constitutes no shift on the V-C continuum, in other words, neither lenition nor strengthening.



From the above representation we can see a considerable degree of both weakening and strengthening in *r*-alternation in both Old and Middle French. During the Old French period a shift towards *V* clearly predominates, in Middle French the distribution of lenition and strengthening is relatively equal, and in Modern French *r* appears to be predominantly involved in processes of strengthening, with the exception of those cases where *r* has been seen to disappear in final position.

### 3.4 The Issue of Phonological Complexity

The above-mentioned conflict that exists between traditional accounts of *r*-alternation and the interpretation of these processes within the framework of dependency phonology still needs to be examined. We therefore ask ourselves why certain *r*-processes, which have traditionally been interpreted as lenition, clearly indicate strengthening according to the criteria outlined in DP for measuring phonatory strength.

Those linguists suggesting that a change involving *r* represents weakening often seem to equate 'strength' with the notion of 'difficulty'. Liquids are generally accepted as being difficult to distinguish from one another, and front trilled *r* especially, is frequently described as having a problematic realization. Jakobson (1968, p.57) points out that many languages only contain one liquid and he supports Benveniste's<sup>22</sup> claim that in children, the production of a second liquid, usually the non-lateral, constitutes a "late or rare phonological acquisition". Studies in Spanish, Portuguese, and Italian, where the apical trill is still the

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<sup>22</sup>(1939), *Travaux du Cercle Linguistique de Prague*, VIII, 34 (cited in Jakobson, 1968, p.57).

predominant variant. have shown that children often encounter great difficulty in learning to properly ‘trill’ their *r*’s. Consequently, many linguists examining the change from *r* to some other sound such as *l* or *z* describe the process as a ‘weakened’ or ‘relaxed’ pronunciation due to the speakers’ inability to produce the trilling of the apex against the alveolar ridge. Nyrop (1902), for example, speaks of “une articulation nonchalante” for the alternation between *r* and *l* (see p.42).

Straka (1964), however, clearly does address the notion of ‘articulatory strength’ in noting that more articulatory energy is expended in the contracting of the articulatory muscles during the realization of consonants than during the production of vowels. He explains that for the former, “les muscles éleveurs” are contracted to bring about the *closure* of the buccal cavity, while for the latter, “les muscles abaisseurs” are instrumental in the *opening* movement of the mouth. Although Straka was unable to establish a ranking of strength for the sonorant group (see p.71) the idea of “resistance to airflow” is certainly apparent in his examination.

Nevertheless, despite the fact that Straka’s detailed descriptions of the processes are based on variants observed in several French dialects, his account of the various stages of movement as constituting a particular sound change merely seem to reflect the most probable sequence the articulatory organs might follow in order to link the realization of one variant to that of the other variant. It should be noted here that we are not claiming Straka’s explanation to be false. We are only suggesting that, in so meticulously describing not only the manner and degree of constriction but also the place of contact, Straka also falls into the trap of not properly distinguishing between *strength* and *complexity*. It is necessary,

however, to discriminate between the degree of closure characterizing a sound and the manner in which the articulatory organs are placed and manoeuvred during its realization. The fact that for *r* the tongue tip needs to be slightly curved up and tensed ‘just right’ in order to achieve the trill while the realization of [z] allows for a more liberal (or less precise) movement of the tongue, is not a factor in the measuring of articulatory strength. Instead of interpreting the change from a more ‘complex’ manner of articulation as *weakening*, we might more accurately refer to the process as the *simplification* of a complex segment<sup>23</sup>.

In order to better understand the issue of phonological complexity we examine briefly the notions of markedness and naturalness, which are often linked to the idea of complexity of segments and classes of segments.

### 3.4.1 Markedness and Naturalness

The term *markedness* was first used by Trubetskoj (1958) in the Prague School of Phonology with reference to the neutralization of the opposition between two phonemes. More specifically it was used to explain that “when two phonemes are neutralized in a given position, it is the ‘unmarked’ member of the opposition which is found phonetically” (Hyman, 1975, p.143). The ‘marked’ member was the phoneme less likely to be found in a position of neutralization. In Prague School terms, this notion of marking was seen as being language-specific; in other words, the criteria for determining whether a member was marked or unmarked differed from one language to another. The concept of markedness was later extended and applied cross-linguistically in order to describe *universal* tendencies,

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<sup>23</sup>...although simplification may not necessarily occur in the alternation of *r* and *l* or *r* and *z*.

according to the following main criteria (Hyman, 1975, pp.145-146):

### 3.14) *Criteria for markedness*

- 1) the *addition* of a feature (e.g. [d] is voiced and therefore marked as opposed to [t], which is unvoiced and unmarked)
- 2) the *frequency* of occurrence of a member of an opposition (the less frequently appearing member is considered to be marked)
- 3) the *neutrality* of a phoneme (e.g. [ə] is considered to be the neutral vowel in French and is therefore unmarked)
- 4) the *regularity* of a feature (e.g. final stress is unmarked in French because stress regularly falls on the final syllable).

In generative phonology, the notion of markedness is considered not only to be part of a universal phonological theory but also as having a phonetic basis. In other words, values of markedness express the naturalness of a segment or a class. According to generative phonologists:

Unmarked sounds are said to be generally acquired earlier than marked sounds by children. They are also generally required in the inventory of sounds of a language before marked sounds can be added. In linguistic change, sounds are seen as changing from marked to unmarked. (Hyman, 1975, p.147)

As pointed out in our introduction of dependency phonology, the degree of ‘naturalness’ of a class or process is expressed more clearly in a theory offering greater componentiality (see p.61). Chomsky and Halle (1968, p.402) admit that their theory outlined in *SPE* fails to accurately express “the naturalness of a class”. They attempt to remedy this “fundamental theoretical inadequacy” by proposing a “theory of ‘markedness’” in order to “accommodate the effects of the intrinsic content of features, to distinguish expected or natural cases of rules and symbol configurations from others which are

unexpected and unnatural". Hence, features of segments are assigned the values 'u' or 'm', designating them as 'unmarked' or 'marked' respectively. When determining the 'markedness' or 'complexity' of a segment only the marked features are considered. Thus the segment containing the greater number of marked features is the more complex one. The values 'unmarked' and 'marked' are interpreted by a set of universal rules which "systematically replace the symbols 'u' and 'm' by the symbols + and -". and since these rules are merely conventions for interpreting the grammar, they do not add to its complexity (Chomsky & Halle, 1968, p.403). The naturalness of processes is expressed by "linking" the marking conventions to the output of phonological rules (see Chomsky & Halle, 1968, pp.319-435).

According to Anderson and Ewen (1987), however, the marking and linking conventions proposed in *SPE* only make this an "elaborated minimally componential theory". They support Lass' (1975) criticism of the theory by noting that:

[Chomsky and Halle] have not provided an account of the composition of features or of anything else that could reasonably be described as intrinsic. Rather, they have devised a system for relabelling and, on the basis of this, costing feature-values in such a way that phonological representation ceases in various cases to be at odds with the...componentiality assumption. But the relabellings are carried out specifically to conform with the recurrences they are intended to explain; they have no independent motivation. The markedness apparatus does not represent any increased insight into the nature of phonological structure, but is added on ad hoc to a conception of phonological structure based on binary features; its role is simply to repair flaws of this conception (p.16).

Lass (1980, pp.43-44) goes so far as to say that "markedness theory in its formal dress is simply an alternative (actually pseudo-mathematical) representation" of "the blinding tautology that nature tends toward the natural".

As was established earlier, the expression of 'natural' or 'recurrent' classes and

processes is a primary issue in dependency phonology. With respect to our historical analysis of French *r*, an analysis of the resonant according to the degree of complexity attributed to it as a segment-type offers some interesting and significant insights into possible explanations for the alternations of French *r*. It is for this reason that we examine in some more detail how the notions of naturalness and phonological complexity are characterized specifically in the DP model of representation.

### 3.4.2 Naturalness and Phonological Complexity in DP

Although a substantial part of the developments of the notational system in dependency phonology appears to support the work of Lass, the formulators of DP reject his rather severe theoretical argument that the notion of markedness need not at all be present in the characterization of phonological segments. Lass (1984, p.279) believes that “[o]verall...it’s a good idea for *all* markedness considerations to be excluded from phonological characterizations: there is no reason for a particular language to code in its own segment specifications what are in essence facts about language-in-general”. However, Anderson and Ewen (1987, pp.167-168) maintain that this view is “untenable” with the following argument:

...[t]he ‘structural laws’ of Jakobson (1968), on which ultimately the notion of complexity is based, owe their origin to parallelism between various aspects of phonological behaviour - language acquisition, aphasia, and phonological inventories - which allow the setting up of implicational universals with respect to phonological systems...[W]e take it that the cross-linguistic existence of such generalisations must have a phonetic basis....On the grounds of phonetic naturalness, then, it seems reasonable to demand of our system of representation that it can in principle provide some analogue of these properties; this analogue must be internal to the system, not externally imposed as in the case of markedness theory. Only by doing this can we also characterize the complexity of particular systems as opposed to others...And

this, we maintain, is necessary even though Jakobson's structural laws have been shown to be idealised, and even though what appear to be cross-linguistic universal tendencies are violated quite spectacularly in individual language families or areas....

Given the representation of segments in the categorial gesture outlined above, it becomes evident how easily and conveniently the issue of complexity is dealt with in dependency phonology. Unlike the generative model, where this notion had to be indicated with another feature, in the DP framework it is the representation itself which accurately reflects the inherent degree of complexity of a particular segment. In other words, a segment of a 'complex' internal structure is characterized by an equally 'complex' representation of the V and C components. The degree of complexity can thus be defined by the number of components used to represent a segment. For example, the representation of the voiced plosive /d/ in the categorial gesture holds more components than that of the voiceless counterpart /t/, the former being characterized by the additional feature of voicing:

3.15) *Representation of the phonological complexity of [d] and [t]*

C→V	C
d	t

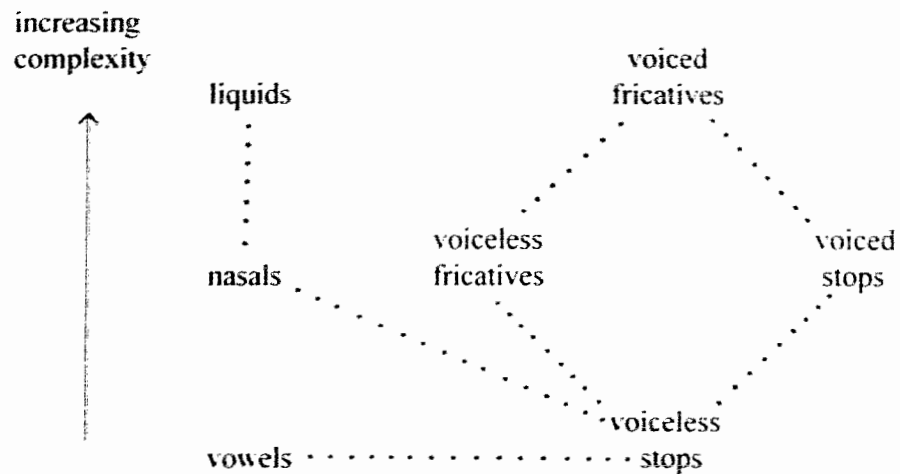
Anderson and Ewen (1987, p.169) present a hierarchy of complexity (see 3.17) below) involving the dependency representations used within the DP system that parallels the hierarchy of basic phonatory segment-types suggested by Jakobson (1968)<sup>24</sup> (see 3.16) below). The hierarchical structure of 3.17) shows three levels of complexity, each of which is characterized by a corresponding number of components in its representations. Each row of

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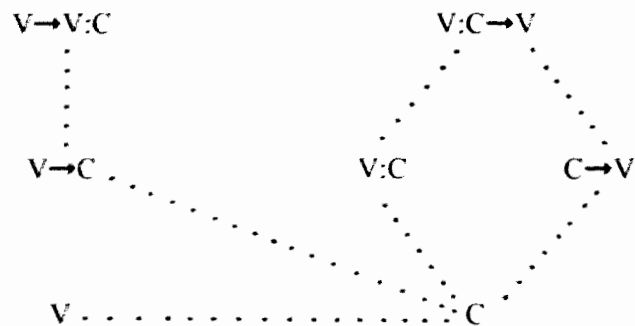
<sup>24</sup>*Child Language Aphasia and Phonological Universals*, Paris: Mouton.

representations is “implicationally dependent” on the segment-types at the level below (Anderson & Ewen, 1987, p.170).

3.16) *Hierarchy of basic phonatory types proposed by Jakobson (1968)*



3.17) *Hierarchy of phonological complexity proposed by Anderson & Ewen (1987)*



With respect to natural classes, the notion of markedness functions just as adequately in DP. The more general the class is, the less complex the representation need be. The class of liquids,  $V \rightarrow V:C$ , for example, requires a representation with three components while the more general class of sonorant consonants,  $V \rightarrow C$ , requires only two components. In the case of the latter a dependency relation of V governing C is representative of the resonants. However, in order to distinguish the class of liquids from the class of nasals within the more general class of resonants, a third component, namely V, is added to represent **l** and **r**. The



nasals are left with a more simple representation as they are more numerous in most languages and are acquired earlier than the liquids.

In the interpretation of a sound change on the V-C continuum, we can deem such a process as ‘more natural’ if the segment-types involved in the change find themselves in closer proximity to each other on the V-C continuum (Ewen, 1977, p.320). In other words, a change between two segments involving only the deletion of a component is considered to be more ‘natural’ than a process involving not only deletion but also a change in the degree of dependency between two components. For example, *r*-alternation with *l*, which simply entails the addition or deletion of another C component is more natural than a change from *r* > *d*, which requires not only the deletion of one V component but also a reversal in the dependency relation between the remaining two components:

3.18) *DP representation of r ~ l and r > d*

$$\begin{array}{ccc} r & \sim & l \\ V \rightarrow V:C & & V \rightarrow V:C \rightarrow C \end{array} \qquad \begin{array}{ccc} r & > & d \\ V \rightarrow V:C & & C \rightarrow V \end{array}$$

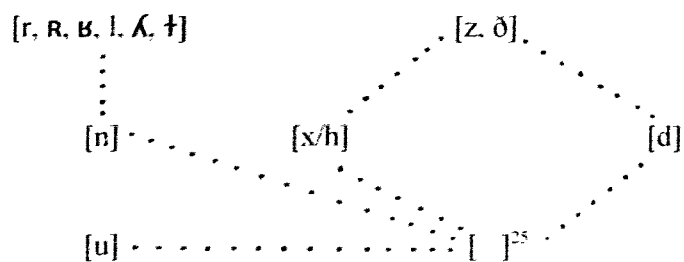
Simplicity, or degree of complexity, is once again linked to the expression of phonological naturalness. With respect to linguistic context, Hyman (1975, p.161) notes that there is even “evidence for the relative naturalness of one syllable structure over another”, explaining that certain syllable types are seen as being either created or avoided through various kinds of phonological processes.

### 3.4.3 Phonological Complexity of French *r*

With respect to French *r*, what role does phonological complexity play in the

alternation between the resonant and other sounds during the evolution from Latin to Modern French? According to Anderson and Ewain's hierarchy of increasing complexity as presented in 3.17), the liquids and voiced fricatives are ranked at the top, which means [r, ʀ, β, l, ʎ, ʒ] and [z, δ] are more complex than the nasal [n], the voiceless fricatives [x/h], and the voiced plosive [d], all ranked in second place, and these in turn are more complex than the vowel [u] at the bottom of the hierarchy:

3.19) *Complexity ranking of French sound-segments involved in r-processes*



Given the above ranking of phonological complexity and the observation that sounds tend to change from a more complex (less natural) segment to a simpler (more natural) one, it is understandable that a process of phonatory strengthening, such as  $r > Z$ , is also a change towards increased phonological naturalness or 'simplicity'. The idea of two, at times competing, forces working together during a sound change, one force of *phonatory strength* and another force of *phonological complexity*, may explain why French *r* alternated with such a great variety of other sounds in the language. If we consider, for example, a certain time period during the evolution from Latin to French where the general trend for consonants was

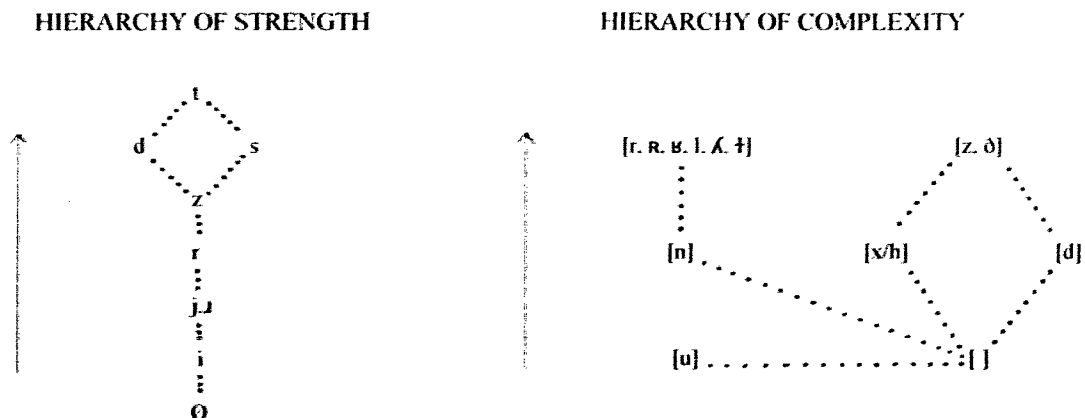
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<sup>25</sup>The empty brackets, on the same level of complexity as the vowel [u], would generally hold a voiceless plosive. Since *r* did not alternate with such a segment-type, however, we have chosen to leave it blank here.

weakening, but at which stage French *r* was involved in processes of strengthening, this unexpected behaviour may be attributed to the level of complexity characterizing the nature of the resonant. A change towards a phonologically less complex, but phonetically stronger, segment predominated.

As already mentioned, these two forces or trends towards either a phonetically weaker or a phonologically simpler segment may be found to compete with each other. For example, the assibilation of *r* and its frequent and long-standing alternation with laterals may be considered as only logical given that *r*, *z*, and *l* are equally complex segments. The trend towards general consonant lenition is therefore countered by the maintenance of complexity, as in the case of *r*-alternation with *l* and *z*. One step further would entail not simply maintenance of complexity but a move towards a lower level of complexity, or increased naturalness. This might be the case for the change from *r* to *d*, for example, which involves several stages of strengthening but also a decrease in phonological complexity. Thus, while the process represents a move towards greater C-ness or phonetic strength, a simultaneous move occurs towards decreased complexity:

### 3.20) *Comparison of strength and complexity hierarchies*



On the other hand, the two forces may also be found to work together instead of against each other, as in the case of lost *r*. where the process  $r > \emptyset$  is a manifestation of both lenition and phonological simplification. Moreover, the notions of articulatory strength and phonological complexity might explain why *r* was the last among the consonants to undergo complete lenition. First, with respect to strength, considering where *r* is situated on the hierarchy as compared to the other consonants affected by weakening, it would appear that its rank in the middle makes it less susceptible to lenition than the plosives and fricatives, which are phonetically stronger. This seems to be supported by Straka's (1964, pp.77-78) "classement diachronique des changements articulatoires", which shows the loss of plosives to have occurred before the loss of [z] and places loss of *r* at an even later date. Second, although the complete lenition of a segment is a move towards increased simplicity, perhaps it is precisely the complex nature of *r*, placed at the top of the complexity scale, that may also have worked against a hastened or less recent weakening to [∅].

It is, in fact, the reverse process  $\emptyset > r$  which remains relatively unexplained. A move towards the preferred or more natural syllable structure of a language is obtained through certain phonological processes. The restoration of final *r*, however, is certainly not a process resulting in or maintaining the preferred syllable structure (CV) of French - the *loss* of *r* is. According to one explanation, the restoration of lost final *r* may be attributed to two competing sound changes (Timmers, 1977), as opposed to competing aspects characterizing the nature of the segment *r*. The restoration of *r* has also been partly attributed to seventeenth-century societal pressures, based on the number of examples demonstrating hypercorrection, as well as on the resonant quality of the sound *r*. The latter

suggestion leads us to another point, namely the fact that a segment weak in terms of *phonatory strength* is at the same time considered strong in terms of acoustic periodic energy. This inverse relation between articulatory and acoustic energy/strength is significant especially in the case of **r**, due, once again, to its position on the phonatory strength hierarchy. The fact that **r** is ranked in the middle of the lenition hierarchy of 3.5) and is adjacent to the vowel segment-types in the strength hierarchy of 3.6) clearly reflects its ambivalent nature. As far as distinctive features are concerned, the French liquid **r** (along with **l**) is the only one marked as both *vocalic* and *consonantal* (Bibeau, 1975, p.39). This ‘split-personality’ of the sound may be considered as part of the reason why lost **r** was restored in nearly every case.

Finally, the change from *r* to *R*, the only process *not* involving a shift on the continuum consequently also represents no change in terms of phonological complexity. The only modification that has occurred in a permanent manner affects the *articulatory features*.

### **3.5 The Nature of Sounds in Alternation With French r**

We have discussed the types of processes French **r** has undergone, which leaves us to examine briefly the nature of the sound-segments **r** has alternated with throughout its evolution. In other words, why has **r** alternated with, and in certain cases still does alternate with, specifically the sounds presented above? First, it is important to note that the alternation between **r** and other sound-segments has been ‘complementary’, in the sense that those sounds alternating with front **r** never did so with back **r**, and vice versa. The various

sounds may, therefore, be divided into the following two groups:

3.21) *Categorization of front r- and back r-variants*

*r* ~ [l] [ʎ] [n] [z] [ð] [d]

*R* ~ [u] [ʈ] [ʙ] [x/h]

In the first group every sound-segment alternating with front *r* is stronger in terms of articulatory energy and at the same time acoustically weaker than *r*. In other words, front *r* alternation did not involve any vowels or approximants. As for the level of complexity, although the range represented by these six segments is relatively wide in terms of phonological change, the leap between *r* and the dental voiced plosive or the nasal still only entails one stage on the complexity scale of 3.19). Thus, only [d] and [n] are found on a lower level of complexity, while the remaining segments all share the same level as *r*. With respect to articulatory features, it is not surprising that the four non-liquids are all dental and realized apically or pre-dorsally, that is, each segment in alternation with *r* shares more than one feature with the resonant.

In the second group, three of the four sound-segments are phonetically stronger than *r*, leaving the back vowel [u] as the only segment which is weaker than *r* in terms of articulatory energy. In contrast to the first group (of front variants), these back variants represent all three levels of the complexity scale. While the liquids share the same degree of phonological complexity with *r*, the voiceless fricatives represent the middle level and the vowel [u] the lowest. With respect to the place of articulation, those sounds in alternation with uvular *r* all have at least two features in common with the [R], all being characterized

as both ‘back’ and ‘high’ (with the exception of [h], which, as the minimal fricative, is characterized by zero number of articulatory features).

In summary, although the sound-segments found in alternation with *r* do not constitute a natural class by themselves, they all share some features with either the apical or the uvular resonant, whether it be in terms of phonatory components, as shown in 3.22) below,

### 3.22) Commonality between French sound-segments in terms of phonatory components

[R, r]	V→V:C
[l,ʎ,ʃ]	V→V:C→C
[n]	V→C
[z]	V:C↔V
[ð,ʙ]	V:C→V
[d]	C→V
[x/h]	V:C→C
[u]	V

and/or phonological complexity, and/or articulatory features. The uniqueness of French *r* is certainly demonstrated in part by its alternation with such a large variety of different sound-segments.

## 4. Conclusion

The study of the processes characterizing the evolution of *r* from Latin to modern French reveals a sound of an almost paradoxical, and certainly unique, nature. French *r* has been involved in three different types of sound changes, from the isolative change of global velarization as well as general consonant lenition to an extensive number of sporadic alternations entailing a wide range of different sounds. The resonant’s relatively late

consonant lenition as well as its subsequent restoration, coupled with a constant series of alternations with other French sounds (which include the resonants [l, ʀ, t, n], both voiced and voiceless fricatives [z, ð, ʁ, x/h], the vowel [u] and the voiced plosive [d]), demonstrate both restraint and great flexibility with respect to phonetic variation in comparison to other consonants in the language. The fact that the change from a front trilled r to a back trilled r constitutes the phoneme's only permanent change reflects a substantial amount of stability in the overall behaviour of r, however.

An examination of the r-processes within the framework of dependency phonology in terms of articulatory strength and phonological complexity brings to light some of the inherent characteristics of r which may explain the resonant's behaviour during its evolution. By observing the difference between articulatory strength and phonological complexity in our analysis of French r within the framework of DP, we have arrived at a more accurate interpretation of the articulation of r. It becomes clear that the "difficulty" with pronouncing r is not one of physical strength but rather the articulatory complexity of the realization (i.e. correct positioning of the articulatory organs and continuous and adequate airflow throughout the duration of the sound). With respect to its phonatory strength, French r is ranked near the weaker end of the V-C continuum, in relation to stops and fricatives. Conversely, this means that the phoneme is acoustically strong. The implications of a weaker phonatory ranking are that alternations such as r > [z], r > [ð], r > [l], and r > [d] represent a process of strengthening, *not weakening* as has been suggested in many earlier descriptions of historical r-variation. In this respect the DP model has allowed for a scientific clarification of some previous assumptions, either by examining the



plausibility of a particular hypothesis or by providing some insight to the nature of **r** not previously explored.

As to the reasons for strengthening, as well as **r**'s long resistance to lenition in preconsonantal and final positions, all within a period of general consonant weakening, it is the level of phonological complexity which offers some plausible explanations. By taking into consideration the fact that **r** is characterized as one of the most phonologically complex segment-types, an **r**-process of strengthening may often be interpreted as a process of simplification, since language tends towards the less complex / more natural (although the two are not always mutually inclusive) as expressed by the criterion of linguistic economy. The most frequent and commonly known examples of **r**-variation, such as assibilation, the bi-directional alternation between **r** and **l**, and velarization, have all occurred on the same level of phonological complexity, due to the fact that the liquids and voiced fricatives are all ranked at the top of the complexity scale. Furthermore, with respect to loss of **r**, another significant process characterizing the resonant's evolution, the manner and time-frame in which **r** was lost may certainly in part be explained by the high level of complexity the phoneme represents. First, **r**'s rank in the middle of the strength hierarchy may make it less susceptible to lenition than the higher ranked obstruents. Second, the high level of complexity also acts as a protection against early and permanent loss of **r**. Thus, the behaviour and inherent nature of French **r** can be interpreted in terms of two notions, articulatory strength and phonological complexity, which may or may not work together in the various processes characterizing the historical variation of the resonant.

An overview of the evolution of **r** in terms of these two notions reflects a number of

trends. With respect to **r**-processes, lenition usually involves a change *to* **r** ([...] > **r**) while strengthening, in all cases, represents a change *from* **r** (**r** > [...]). The most distinctive general trend, beginning in Indo-European and continuing into the twentieth-century French, is that **r** has become consistently stronger in terms of articulatory strength (and acoustically weaker) while the level of phonological complexity has remained the same, at least until very recently. As noted in 1.2, Indo-European **r** functioned both as a vowel and as a consonant, along with the other resonants, implying a degree of acoustic strength very close to that of approximants. In Latin, **r** had lost this dual function and continued its evolution into French as a consonant in the form of an apical trill. Although the velarization of front **r** at the end of the Middle French period did not involve a change in its phonatory components, it did set the stage for the strengthening that is occurring in the present century, namely the fricativization of [ʀ] to [ʁ], observed in many parts of the French-speaking world. The “new” **r**-variant [ʁ], which resembles the German *Ach-laut* and is usually found in final position, has been observed in various studies of geographical **r**-variation<sup>26</sup>. Thus, until recently, the only permanent change to have affected French **r** has occurred within the articulatory gesture without affecting the components of the categorial gesture, since the change from apical trill to uvular trill did not involve any modification of the resonant’s mode of articulation. Another recent, also regional, phenomenon which supports the trend of **r**-strengthening is found on the Channel Island of Sark where speakers tend to replace

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<sup>26</sup>Borel-Maisonny (1942); Straka & Nauton (1945); Vinay (1950); Haudricourt (1952); Taylor (1952); Léon (1967); Santerre (1979); Chafcouloff (1985).

postconsonantal **r** (resulting from the loss of [ə]) by the affricates [tʃ] or [dʒ]<sup>27</sup> (Liddicoat, 1991, p.121). It remains to be seen whether the most recent trend of strengthening will involve the first permanent change of French **r** within the categorial gesture, that is, a change of segment-type from liquid to fricative. While this change from a uvular voiced trill to a uvular voiced fricative does not represent a change in the level of complexity for **r**, the devoicing of the fricative **r**-variant does.

The above observations lead us to conclude that French **r** is indeed an extremely stable consonant and far from disappearing or being weakened to another phoneme. Throughout its history the resonant has shown great stability, not only through its resistance to an early as well as permanent lenition but also by the fact that its only lasting change merely involved a modification of its articulatory components. The flexibility, which front **r** especially has demonstrated in the form of alternations with other sounds in the language, also expresses this sense of stability. The tendency to alternate with other sounds is continued by the uvular trill today. In a recent study of Montreal French, Santerre (1979) observed twenty different pronunciations for **r**, nine of which constituted allophones for the uvular trill. Despite the well-established dominance of uvular **r** over apical **r**, however, the latter variant is still very much present alongside the back variant. For example, in Quebec and Acadian French the apical trill is generally preferred in a stressed syllable and the acoustic strength of this variant generally makes it the favoured pronunciation on stage. Furthermore, many of the alternations with front **r** still occur today, such as assibilation and **r** ~ **l** alternation, while other front **r**-variants like the apical flap and retroflex have also been

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<sup>27</sup>For example: *je couperai* > [(ʒ) kɔpʁe], *maquereau* > [makʁe], *il fera* > [ifʁa].

observed in contemporary French. The flexibility of **r**, demonstrated by the co-existence of the apical and uvular variants as well as by the various alternations of *r* and *R* with other sounds, is perhaps best embodied in the double articulation of **r**, defined as a voiced uvular trilling which ends in a voiced flap (also recently observed by Santerre (1982) in the French Montreal dialect). The resonant's relative articulatory strength and significant acoustic strength, as well as its highly complex nature allow for such an extensive 'family' of **r**-sounds. As was noted by Lindau (1980, p.118) on the subject of **r**-sounds in general, "...each member of the class of **r**-sounds resembles some other member with respect to some property, but not with respect to the same property across all **r**-sounds". It is this variety of character which makes **r** a phoneme of, what we might call, *flexible stability*.

As a last note, we return to the issue of semantics with respect to the use of the term "instability". As demonstrated in our introduction (see pp.1-2), this term has two meanings, one referring to "a precarious existence" (as interpreted by Fleisch (1946), Borel-Maisonny (1942), and Charbonneau and Marchal (1979)), the other implying "fluctuation" or "variation" (as interpreted by Hock (1986) and ourself). The first of these definitions we have shown to incorrectly describe **r**'s present tendency toward strengthening. With regard to the second, considering the term's two-fold meaning, the confusion caused by the use of the term only further supports our characterization of **r** as being "flexible" rather than "unstable".

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