THE UNIVERSITY OF CALGARY

# Syllable Based Sound Change and Palatalization in Early Romance

by

Naomi Cull

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE

DEGREE OF MASTER OF ARTS

DEPARTMENT OF LINGUISTICS

CALGARY, ALBERTA

JUNE, 1994

ISBN 0-315-99332-4

Name Naomi Cull

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Syllable Based Sound Change and Palatalization in Early Romance" submitted by Naomi Cull in partial fulfillment of the requirements for the degree of Master of Arts.

Supervisor, Dr. Robert W. Murray, Department of Linguistics

Dr. John Archibald, Department of Linguistics

Dr. Douglas C. Walker, Department of French, Italian and Spanish

June 28, 1994

Date

## ABSTRACT

In this work I present a reconstruction of intervocalic consonant clusters in Proto-Romance within the Preference Law theory. I claim that the reconstruction of VC$CV for Proto-Romance provides us with a more uniform account of several sound changes that have taken place in the Romance languages. These sound changes are argued to be motivated by the need to improve the poor syllable structure evident in Proto-Romance. This reconstruction supports earlier claims that the Romance languages did not evolve linearly from Classical Latin but instead derived directly from Proto-Romance, the sister of Classical Latin. It is also argued that a number of sound changes in Romance that have occasionally been described as palatalizations are more suitably characterized as syllable structure improvements. I propose that certain palatalizations in French reflect the shift from a marked to an unmarked phonological system.

## ACKNOWLEDGEMENTS

I would like to take this opportunity to thank a number of individuals who have been instrumental in my academic career. I am indebted to Elaine Sorensen whose enthusiasm first inspired me to pursue linguistics. I am very grateful to my supervisor, Dr. Robert Murray, who has given me a tremendous amount of help and encouragement over the years and is responsible for a large part of the success and opportunities I have received. His patience has always been appreciated. I would also like to express my thanks to Dr. John Archibald and Dr. Douglas Walker for being on my thesis committee and providing useful comments and insights on this research.

I am also indebted to the other members of the linguistics department at the University of Calgary. In particular, I am grateful to Dr. Elizabeth Ritter for the feedback she gave me on this project and the support she has shown me both personally and professionally. I especially appreciate the friendship shown to me by Dr. Eithne Guilfoyle, who has offered me kindness and encouragement and repeatedly indulged my sometimes neurotic behaviour. She was the first person who showed me how fascinating syntax can be.

My thanks also go out to several of my colleagues for comments they gave me on a preliminary oral presentation of this work. In particular I would like to thank Hooi Ling Soh and Teresa Vanderweide. To my friend Hooi Ling, I owe a special debt of gratitude for showing me an enormous amount of kindness and friendship and for being there to pick up the pieces. I will always be grateful for the support she gave me as a fellow student, but more importantly, as a friend.

For taking the time to read a much earlier version of this work, I would like to thank Yves Charles Morin. His knowledgeable comments greatly improved the content of this thesis. As well, I am grateful for the support and advice I received from those who attended the Eleventh International Conference on Historical Linguistics at the University of California, Los Angeles. In particular, I would like to express my thanks to Professors Tom Cravens and Roger Wright.

A number of individuals and institutions helped fund a part of this research. I would like to thank Eithne Guilfoyle for providing me with funding from her Social Sciences and Humanities Research Counsel grant, #410-91-1956. As well, the Government of Alberta provided me with funding in the form of a Province of Alberta

Graduate Scholarship. From the University of Calgary I received a research travel grant which was supplemented by the Departments of Linguistics and Social Sciences. I also express my appreciation to the Department of Linguistics for providing me with funding in the form of teaching and research assistantships. I am also grateful to Dr. Robert Murray and Dr. Douglas Walker for the jobs they gave me which allowed me to put my linguistics education to good use.

Finally, I would like to dedicate this work to Ivano, who has been there for me from the start and has always encouraged me to continue. Thank you for your support.

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# LIST OF ABBREVIATIONS AND SYMBOLS

| | |
|---|---|
| [i̯] | palatal glide |
| [u̯] | labial glide |
| [ɯ] | high back unrounded vowel |
| [β] | voiced bilabial fricative |
| [x] | voiceless velar fricative |
| [ɣ] | voiced velar fricative |
| [j̑] | midpalatal fricative |
| [ʎ] | palatal lateral liquid |
| [ɲ] | palatal dental nasal |
| [ŋ] | velar nasal |
| [ɬ] | voiceless alveolar lateral fricative |
| [r:] | long apico-alveolar trill |
| [θ] | voiceless interdental fricative |
| [ð] | voiced interdental fricative |
| [t̪'] | unreleased voiceless dental stop |
| [ts] | voiceless dental-alveolar affricate |
| [dz] | voiced dental-alveolar affricate |
| [tš] | voiceless palato-alveolar affricate |
| [dž] | voiced palato-alveolar affricate |
| [š] | voiceless palato-alveolar fricative |
| [ž] | voiced palato-alveolar fricative |
| <ă> | [ə] in Romanian |
| <î/â> | a sound tenser than [ə] in Romanian |
| <ô> | [o] in Portuguese |
| <c> | [s] before [e] and [i] in Portuguese |
| <ç> | [s] in Portuguese; [ts] in Old Spanish |
| <ch> | voiceless palatalized velar stop that appears before front vowels in Romanian |
| <gh> | voiced palatalized velar stop that appears before front vowels in Romanian |
| <g> | [z] before front vowels in Portuguese |
| <j> | [ž] in Portuguese and sometimes in Spanish |
| <lh> | [ʎ] in Portuguese |
| <ll> | [ʎ] in Spanish |
| <nh> | [ɲ] in Portuguese |
| <ñ> | [ɲ] in Spanish |
| <ş> | [š] in Romanian |
| <ţ> | [ts] in Romanian |
| <x> | [š] in Portuguese |

| | |
|---|---|
| A | articulator |
| AF | Air Flow |
| And. | Andalusian |
| ant | anterior |
| C | consonantal sound |
| Cat. | Catalan |
| CL | Classical Latin |
| colloq. | colloquial |
| cont | continuant |
| D | voiced stop |
| dial. | dialect |
| Eng. | English |
| F | fricative, except where otherwise noted |
| Fre. | French |
| fut. | future |
| FVP | First Velar Palatalization |
| G | glide |
| GR | Gallo-Roman |
| indic. | indicative |
| It. | Italian |
| L | liquid |
| Lt. | Latin |
| Mod.Eng. | Modern English |
| MSp. | Modern Spanish |
| N | nasal consonant |
| O | obstruent |
| OCP | Obligatory Contour Principle |
| OEng. | Old English |
| OFre. | Old French |
| OIt. | Old Italian |
| OL | Old Latin |
| OSp. | Old Spanish |
| pass. | passive |
| Pg. | Portuguese |
| pl. | plural |
| pluperf. | pluperfect |
| pop. | popular |
| PR | Proto-Romance |
| pret. | preterite |
| Rom. | Romanian |
| SCL | Syllable Contact Law |
| sg. | singular |
| Sp. | Spanish |
| subj. | subjunctive |
| SV | Sonorant Voice |
| SVP | Second Velar Palatalization |
| T | voiceless stop, unless otherwise noted |
| TP | tongue position |
| $\breve{v}$ | short vowel |
| $\bar{v}$ | long vowel |

| | |
|---|---|
| v́ | stressed vowel |
| ṽ | nasalized vowel |
| V | vocoid |
| VL | Vulgar Latin |
| VOC | vocalic |
| + | reconstructed form |
| > | becomes |
| < | derives from |
| * | hypothetical or incorret form |
| $ | syllable boundary |
| σ | syllable |
| ø | a form or segment that has been lost |
| ~ | alternates with |

# Chapter One

# INTRODUCTION

Over the years there have been many accounts of the historical developments of the Romance languages. Various authors have examined the development of individual languages, such as Grandgent (1927) for Italian, Pope (1952) for French, and Williams (1962) for Portuguese, to name only a few. As well, there have been numerous studies examining the Romance languages as a whole in order to find the relationships that exist among the languages and to discover the source of these languages, as in Elcock (1960), Hall (1950, 1974, 1976), Pulgram (1950, 1976) and others. The purpose of this work is to show that many of the sound changes which occurred in the Romance languages and have been discussed by a number of authors can be uniquely accounted for within the Preference Law theory (Vennemann 1988).

In particular we look at word-medial consonant clusters consisting of a plosive followed by either a liquid or a glide. There has been much discussion as to how these clusters were syllabified at an earlier stage of Romance. Many historical linguists have argued for the syllabification V$CCV, in which the plosive plus liquid or glide are tautosyllabic (see Muller 1929; Elcock 1960; Grandgent 1962). Others (Allen 1973) have instead made the claim that the syllabification is actually VC$CV, in which the consonant cluster is heterosyllabic. My investigation will show that there is in fact support for this latter claim.

## 1. Overview

### *1.1 Chapter one*

The last half of this first chapter is devoted to the presentation of the theoretical framework on which this study is based. The Preference Laws (Vennemann 1988) provide a means for determining the relative preference of syllable structures which occur in a language and can be used to predict how syllable structure will change. It will be argued that a variety of sound changes that have taken place in the history of the Romance languages arose as a means of improving the syllable structure of a word. Because the direction of improvement can be captured by the Preference Laws, we are able to reconstruct an earlier syllable structure from which the Modern Romance syllable structures can be derived.

### *1.2 Chapter two*

In chapter two I discuss various sound changes from Italian, Catalan, Portuguese, French, Romanian and Spanish. Some of the phonological changes that have taken place in Romance include gemination, coda weakening, tautosyllabification and glide strengthening. I will argue that these apparently unrelated changes can be generally accounted for as syllable structure improvements once we begin with heterosyllabic word-internal consonant clusters in Proto-Romance.

### *1.3 Chapter three*

In chapter three I present two recent syllabification models, the first from Clements (1990) and the second from Rice (1992). Both theories utilize the notion of sonority in describing how consonants are divided into syllables. These authors' observations are similar to the ones made by Vennemann's (1988) Preference Laws which instead employs consonantal strength in describing syllabification. While both of these more recent proposals adequately describe most types of syllabification, we will see that Clements does not account for how poor syllable structures will be improved, and Rice's model does not include segments like glides and /r/ which are crucial in establishing the syllabification of consonant clusters in Proto-Romance.

### *1.4 Chapter four*

Chapter four concerns palatalization in French, Italian and Romanian. Certain sound changes in these languages, like glide strengthening, have at times been labelled as "palatalizations" (cf. Pope 1952 for French and Grandgent 1927 for Italian). I argue against this traditional account and instead demonstrate that these changes are more accurately explained as syllable contact improvements.

For instance, 'true' palatalization, as in the fronting of a velar before a front vowel, occurs in the French word *argent* 'money' from OFre. [ardžẽnt], Lt. *argentum*. In this word the voiced velar becomes a palato-alveolar affricate because of the palatalizing effect of the front vowel. During a later stage in the history of French, this same affricate also appeared when certain consonants preceded a glide. For example, Lt. rub[i]am, GR +[robdžu] > OFre. [rɔdžə] > Fre. *rouge* 'red'. Because an identical affricate was produced in both instances, some linguists (Pope 1952) have subsumed both developments

under the single label of "palatalization". Upon closer examination, however, the second example can be shown to be a syllable contact change. Because a stronger coda is followed by a weaker onset, the syllable contact in *rubiam* is nonpreferred. This situation is improved by glide strengthening. The initial glide strengthens to an affricate in order to improve the syllable contact.

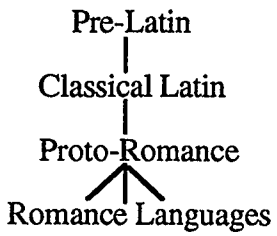
What we see from this example is that closer scrutiny of "palatalization" in these languages reveals separate developments. On the one hand we have assimilatory changes which result in palatalization, and on the other we have glide strengthening which just so happens to mimic the result of palatalization. Identifying the latter development as syllable structure induced provides a more accurate explanation for certain sound changes in these languages.

Although recent models of palatalization presented by Lahiri and Evers (1990) and Hume (1992) can describe how the "palatalizations" outlined above take place on a phonetic level, these frameworks fall short in predicting the outcome of palatalization. Although these models can describe the phonetic changes involved in a "palatalization" such as glide strengthening, they fail to explain why the change has occurred in the first place. However, an explanation can be found within the Preference Law theory.

### *1.5 Chapter five*

In this chapter I discuss how the reconstruction of word-internal consonant clusters for Proto-Romance affects what we know about the origin of the Romance languages. According to one view (Lindsay 1894; Muller 1929; Elcock 1960; Pei 1976), the Romance languages derived from Classical Latin with an intermediate stage of Vulgar Latin, as represented in (1).[1]

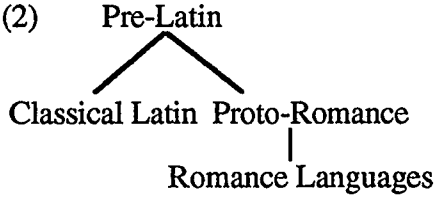
(1)




[1]Based on Hall (1950:24).

This chronological development can be maintained if we believe that the predecessor of the Romance languages shared the same features of Classical Latin. However, we will see in the final chapter that there are features that these two groups do not share which indicate that the Romance languages developed separately from Classical Latin. Divergent developments do not necessarily prove that the Romance languages do not derive linearly from Classical Latin, but I will show that there is strong evidence to support a dialectal split between Classical Latin and the predecessor of the Romance languages, which I label Proto-Romance following Hall (1950). Based on the differences in syllabification between Classical Latin and Proto-Romance that I present in this paper, I propose a development such as the one illustrated below.

(2)

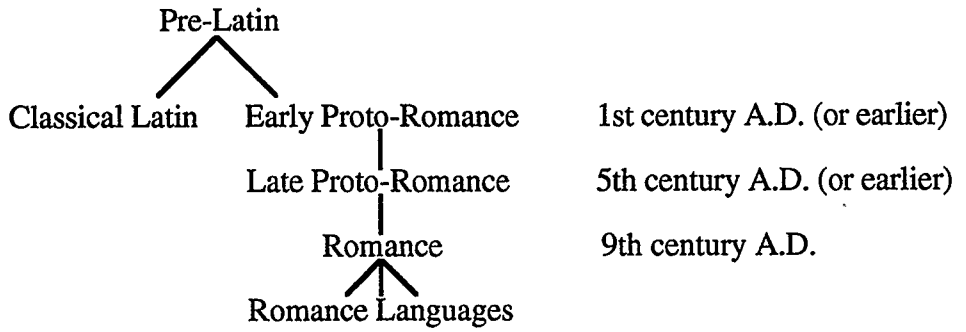



As can be seen in this diagram, Proto-Romance is the sister to and not the daughter of Classical Latin. This type of representation can best explain why certain features are found in Classical Latin but not in Proto-Romance and vice versa.

Some authors have maintained that the Romance languages are derived from a spoken form of Latin, commonly labelled Vulgar Latin (e.g., Mańczak 1987). However, Hall (1950:8) and Wright (1982:53) argue that the predecessor of the Romance languages, which I have indicated as Proto-Romance, cannot be equated with Vulgar Latin. First, the term "vulgar" itself has many connotations and so is not very useful. Second, Hall (1950:8) states that Vulgar Latin is actually a later form of Romance from which the eastern and southern Romance languages cannot be derived. Because there are *vulgus* words which do not exist in the Romance languages, Wright (1982:53) argues that Vulgar Latin is not equivalent to Proto-Romance. This indicates that Vulgar Latin existed prior to Proto-Romance which explains the lack of *vulgus* words in the Romance languages. While it appears that Hall would like to push Vulgar Latin forward in time, Wright argues that Vulgar Latin must be pushed back.

These two positions can be made compatible if we posit a development like that shown in (3).[2]

(3)




In this diagram, there are two stages of Proto-Romance: an early stage and a late stage. Early on the eastern and southern Romance languages broke away from Proto-Romance, which may explain why these Romance languages do not share certain features with the other Romance languages. It is also in this earlier stage of Proto-Romance in which the *vulgus* words that Wright (1982) refers to may be found. Between Early and Late Proto-Romance these words may have vanished through normal lexical loss, which explains why they are not found in the Modern Romance languages. This reconstruction allows for the divergence of the eastern and southern Romance languages and for the lack of *vulgus* words in the Modern Romance languages.

The reconstructed word-internal syllable structure for Proto-Romance provided here supports the split between Classical Latin and Proto-Romance. Once we accept that Proto-Romance had heterosyllabic word-internal consonant clusters, the position that this form of Romance derived linearly from Classical Latin cannot be maintained given that metrical and accentual evidence indicates that these same clusters were tautosyllabic in Classical Latin (see Allen 1973). Since early evidence indicates that Pre-Latin had heterosyllabic consonant clusters (Allen 1973:137-138), we are compelled to derive Proto-Romance directly from Pre-Latin and not Classical Latin. Shifting from heterosyllabic to tautosyllabic consonant clusters in Classical Latin can be accounted for as a syllable contact improvement however, there is little motivation for the Classical Latin tautosyllabic consonant clusters to become heterosyllabic in Proto-Romance since a poor syllable contact would be the result. In other words, the tautosyllabic clusters (V$CCV) evident in

[2]These dates are based on Wright (1982).

Classical Latin are argued not to be the source of the heterosyllabic clusters (VC$CV) of Proto-Romance.

## 2. Theoretical Framework

There have been many difficulties in attempting to reconstruct a standard syllable structure for Proto-Romance. For instance, do we divide a word-medial consonant cluster as VC$CV or V$CCV? Murray and Vennemann (1983) (hereafter M & V) examined a similar problem with regards to Proto-Germanic syllable structure and concluded that the correct reconstruction for Proto-Germanic consonant clusters was VC$CV. Similarities between Germanic and Romance recognized in M & V's paper as well as Murray (1987), have led led to this investigation of Proto-Romance syllable structure. The reconstruction of Proto-Romance consonant clusters in this paper is done within the Preference Law theory outlined in Vennemann (1988). The main principles of this theory are presented below.

### *2.1 Preference theory*

The Preference Laws presented in this paper are from Vennemann (1988) with further expansion from other sources. Vennemann presents more Preference Laws than those discussed here. I offer those which are pertinent to the present investigation.

It is well known that syllable structure can help explain certain phonological phenomena such as stress and tone assignment (see Halle and Vergnaud 1987). Syllable structure can also provide the basis for certain sound changes, such as syllable-initial glide strengthening in Modern Spanish (Pensado 1989:128). Vennemann (1988) accounts for certain sound changes by referring to the syllable structure of a particular language and the Preference Laws for syllable structure.

The Preference Laws are to be construed as universals however, individual languages can develop their own language-specific tendencies which sometimes conflict with universal laws and so 'unnatural' structures sometimes arise. This is to be expected by virtue of the fact that dialects undergo different influences that shape them in various ways. For instance, although there is a Preference law that predicts that a plosive and liquid may occur together in a syllable head, an individual language may have a phonotactic constraint which disallows consonant clusters to cooccur in the same syllable; therefore, the plosive and liquid would be divided into separate syllables (cf. Rice 1992). While the

Preference Laws reflect universal tendencies regarding the most preferred syllable structures, language-specific sequential constraints often create less than desirable structures . These types of language-specific accommodations are also a part of the Feature Geometry theories of Clements (1990) and Rice (1992) we examine later.

A preference theory is a type of markedness theory which provides a basis for determining the relative preference of given structures relative to a particular parameter (Vennemann 1988:1). The laws of the Preference theory are observed in various aspects of language, including language change, typology and acquisition. According to Vennemann (1988:1) 'These laws specify the preferred syllable patterns of natural languages as well as determine the direction of syllable structure change'. Within this theory, preference implies a better/worse condition rather than a natural/unnatural condition. Employing a better/worse condition allows us to compare different types of syllable structures on a certain parameter. For instance, based on the Preference laws outlined below, we can say that syllable head X is better than syllable head Y because it is more in line with a particular Preference law. Rather than assigning a plus or minus feature to a syllable structure, there is a continuum on which a syllable structure is graded as being more or less preferred than another syllable structure on the same parameter. Specifically, we can say that "'X is the more preferred in terms of (a given parameter of) syllable structure, the more Y', where X is a phonological pattern and Y a gradable property of X" (Vennemann 1988:1).

Any improvement to a syllable structure is considered a syllable structure change. However, a change that worsens syllable structure is not motivated by syllable structure according to Vennemann, but is a change which affects syllable structure and is motivated by a different parameter. As an example Vennemann (p. 2) mentions that vowel deletions, such as syncope, always worsen syllable structures. The most common syllable is CV cross-linguistically (Greenberg, Osgood and Jenkins 1966:xxv), and is the first syllable produced by children (see Ingram 1989:108) therefore, it is considered the most preferred. Given a sequence of CVCVCV, for example, syncope might produce CCVCV with two consonants in contact resulting in a less preferred, therefore worse, syllable structure.

Before introducing the principles of the Preference theory it is necessary to discuss consonantal strength, which plays a crucial role in this framework.

### *2.1.1 Consonantal strength*

The phonetic correlates of each speech sound in a language can be placed on a Consonantal Strength scale like the one shown below. One way to measure strength is by

the 'degree of deviation from unimpeded (voiced) air flow' (Vennemann 1988:8). This definition accounts for the voiceless stops being the consonantally strongest segments on the scale. Segments on the scale are arranged hierarchically from weakest to strongest, as represented in (4) (from Murray 1987:118).

(4)

| | | |
|---|---|---|
| weak | ↓ | glides |
| | | liquids |
| | | nasals |
| | | voiced fricatives |
| | | voiceless fricatives/voiced stops |
| strong | | voiceless stops |

Aside from defining consonantal strength articulatorily, historical change also leads us to rank consonants according to the hierarchy in (4). A phonological process such as spirantization independently indicates that change takes place in a certain direction. For example, historically there is a tendency for consonants to weaken intervocalically, such as /t/ > /d/ > /ð/ (cf. Hooper 1976:201-207; Foley 1977). These types of developments are reflected in the strength hierarchy.

While a Consonantal Strength scale is considered universal, there may be language-specific variation. That is, in one language voiceless fricatives may be considered stronger than voiced stops rather than equal to them, as is represented in (4). As well, among a particular class, certain segments may be considered stronger than others. For instance, Foley (1977:32, 50) suggests that labials are stronger than dentals and velars in Romance, whereas dentals are stronger than labials and velars in German (cf. Hooper 1976).[3] The language-specific variation we see with regards to consonantal strength appears to take place either between adjacent classes of segments, such as nasals and liquids, or within a group with the same consonantal strength, such as voiced stops and voiceless fricatives. There does not appear to be a case in which liquids might be considered stronger than stops within a particular language, for example.

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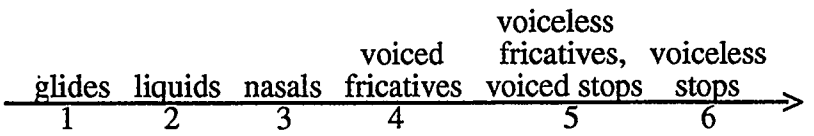
[3]Harris-Northall (1990:14) disagrees with Foley on the strength hierarchy for Romance. He believes that the strength relationship between labials, velars and dentals that Foley maintains for all of Romance only holds for Hispano- or Western Romance. However, in this paper I follow the findings of Foley (1977) and Murray (1987) and will use the Romance Strength scale presented here.

As will be seen shortly, a number of the Preference laws refer to consonantal strength values in determining preferred syllable structure. This makes it useful to assign each class of segments a strength value as shown in (5).[4]

(5) Consonantal Strength Scale (M & V 1983:519, based on Hooper 1976:206)




It should be kept in mind that these values are used for expository purposes and are not absolute. The numbers reflect the strength of one group of sounds with respect to another.

Based on sound changes which have occurred diachronically in the Romance languages, Murray (1987:119, following Foley 1977:32) presented a refined Consonantal Strength scale for Romance . In this scale, labials are considered stronger than velars and dentals. Foley (1977) finds evidence for this from the fact that intervocalic dentals and velars are deleted in Spanish and French as shown in (6) and (7), but the labials remain. These examples are from Murray (1987:119).

| | | | |
|---|---|---|---|
| (6) | Lt. rēgālem | Sp. real | 'royal' |
| | Lt. crēdo | Sp. creo | 'I believe' |
| but | Lt. habēre | Sp. haber [aßer] | 'to have' |
| | | | |
| (7) | Lt. legere | Fre. lire | 'to read' |
| | Lt. amīcam | Fre. amie | 'friend' |
| | Lt. crēdere | Fre. croire | 'to believe' |
| | Lt. vītam | Fre. vie | 'life' |
| but | Lt. habēre | Fre. avoir | 'to have' |
| | Lt. rīpam | Fre. rive | 'riverbank' |

In the Strength scale for Romance, /l/ is taken to be stronger than /r/. Evidence for this comes from Romance examples in which /l/ has weakened to /r/. In Romanian, for example, intervocalic /l/ weakens to /r/. In Spanish and Andalusian, word-final /l/ and syllable-final /l/ weaken to /r/, respectively. These examples are from Murray (1987) and Vennemann (1988).

[4]See Foley (1970), Hooper (1976) or Vennemann (1972) for further discussion.

| | | | | | | |
|---|---|---|---|---|---|---|
| (8) | Lt. | solem | | Rom. | soare | 'sun' |
| | Sp. | local(e) | > | | lugar | 'place' |
| | And. | alma | > | | arma | 'soul' |

The Consonantal Strength scale for Romance as presented by Murray (1987:119) is given below.[5]

(9) Consonantal Strength Scale for Romance

| a. | | | b. | | | c. | | | |
|---|---|---|---|---|---|---|---|---|---|
| weak | \| | r | weak | \| | velars, dentals | weak | \| | i̯ u̯ | 1 |
| | \| | | | \| | | | \| | r | 2 |
| strong | ↓ | l | strong | ↓ | labials | | \| | l | 3 |
| | | | | | | | \| | N | 4 |
| | | | | | | | \| | v | 5 |
| | | | | | | | \| | d g | 6 |
| | | | | | | | \| | b f | 7 |
| | | | | | | | \| | t k | 8 |
| | | | | | | strong | ↓ | p | 9 |

## 2.2 *Sonority hierarchies*

There are a number of other theories in which the 'strength' of a segment is used in determining syllable structure. I will briefly discuss two models that use the notion of 'sonority' in determining the syllabification of consonant clusters. Later we will examine both theories more closely in order to see how they account for the Romance data I will be presenting in the following chapter. The first model is from Clements (1990) and the second is from Rice (1992). Both theories are based in a Feature Geometry framework (Clements 1985).

### 2.2.1 *Clements (1990)*

For Clements (1990:292), the sonority of a segment is based on the amount of plus-specification features a segment has. The features which determine sonority are shown in the diagram below. In this chart O = obstruent, N = nasal, L = liquid and G = glide. The ranking of sonority goes from left to right, with the lowest ranked segments being the obstruents to the highest ranked being the vowels in this chart of nonsyllabic elements.

---

[5]Murray has assumed that /b/ and /f/ are of equal strength according to the Consonantal Strength scale shown earlier.

(10)

| O < | N < | L < | G | |
|---|---|---|---|---|
| - | - | - | - | "syllabic" |
| - | - | - | + | vocoid |
| - | - | + | + | approximant |
| - | + | + | + | sonorant |
| 0 | 1 | 2 | 3 | rank (relative sonority) |

In this sonority scale, the more plus-specifications a segment has the more sonorous it is. Clements also presents a Sonority scale which includes vowels.

(11) Sonority Scale (Clements 1990:294, from Rice 1992:65)

| least sonorant | obstruent < nasal < liquid < glide < vowel | most sonorant |
|---|---|---|

Comparing the Sonority scale from Clements and the Consonantal Strength scale from M & V (1983), we see certain differences. Murray and Vennemann do not include vowels on their scale since they are only considering segments which do not act as syllabic elements. On the opposite end of the scale, we see that Clements does not articulate his class of obstruent segments as M & V do. For M & V, the strength difference between fricatives and stops is a natural result of the definition of consonantal strength provided earlier. Stops are articulated with more impeded air flow than are fricatives and therefore, stops are stronger than fricatives. Clements also does not differentiate between voiced and voiceless segments. The strength difference between voiced and voiceless segments that M & V include in their strength scale is also based on the same definition. Voiceless segments are stronger than voiced ones because they deviate more from unimpeded, voiced air flow. Clements argues (p. 296) that cross-linguistic evidence, such as that presented in Greenberg (1978), does not provide evidence for these further subdivisions on the sonority scale. Clements (p. 296) states that by including language-specific tendencies in the sonority hierarchy the ability of the sonority theory to make cross-linguistic generalizations is lost. However, it was pointed out earlier that M & V's Consonantal Strength scale reflects linguistic developments. For instance, we often see the historical development of /t/ > /d/ > /ð/. This progression reflects the idea that voiceless stops weaken to voiced stops which in turn weaken to fricatives. By not articulating the classes of sounds into more discreet units, Clements does not reflect significant phonological developments in his sonority scale.

The Consonantal Strength scale presented by M & V seems to be a compromise between Clements' sonority scale and the strength scale for Romance in that it presents subdivisions within the class of obstruents but does not further subdivide the voiced and voiceless stops. That is, on the universal Consonantal Strength scale there is no distinction between labial, dental and velar stops as there is on the Romance strength scale. Nor is there a division between the liquids. This too is only a part of the scale for Romance. Unlike the strength scale for Romance, Clements' scale does not include place of articulation features, similar to M & V's original Consonantal Strength scale. Once again this can be explained by the fact that place structure seems to be a language-specific condition on sonority or consonantal strength and therefore should not be a part of a universal strength hierarchy. Both the Consonantal Strength scale and the Sonority scale represent those divisions which appear to be cross-linguistic without presenting those that are specific to a language or group of related languages. With further research however, it may be possible to include place features on the universal Consonantal Strength/Sonority scales on the basis of cross-linguistic generalizations pertaining to place features.

The main difference between these two scales is the subdivision of the obstruents. In this paper I will use the Consonantal Strength scale since it provides a better basis for an account of the sound changes in the Romance languages.

The use of the term 'sonority' in phonological theory has been criticized since there is no agreement on what exactly is meant by sonority. There are no exact articulatory or acoustic properties that identify what sonority is (Ohala and Kawasaki 1985). Yet without accepting that the notion of sonority is valid, we cannot account for 'the nearly identical nature of sonority constraints across languages' (Clements 1990:291). Clements (p. 291) argues that even though adequate phonetic definitions for 'phoneme' and 'syllable' do not exist, we still use these constructs in modern phonological theory. Because the strength scale that Clements utilizes incorporates a definition of sonority which 'is a composite property of speech sounds which depends on the way they are specified for each of a certain set of features' (p. 297), the problem of finding a single phonetic correlate to define sonority is at least partially resolved. A quote from Clements (p. 298) describes the role of sonority in phonological theory best:

> Although the notion of relative sonority cannot be defined in terms of any single, uniform physical or perceptual property, we need not conclude that it is a fictitious or purely subjective matter, as long as we consider it a composite attribute of speech sounds, defined in terms of a set of major class features which themselves have relatively well-defined attributes.

These ideas should be kept in mind with regards to consonantal strength which is an equally valuable tool in explaining certain cross-linguistic phenomena and phonological change. Although sonority and consonantal strength can often be thought of as two sides of the same coin, they are not identical. For instance, on the Consonantal Strength scale a shift from a stop to a fricative, (/t/ >) /d/ > /ð/, is considered a weakening because the fricative is consonantally weaker than a stop. Yet in sonority terms, this same change is considered to be a strengthening because the segment increases in sonority. It is important to keep in mind therefore, that the scales and terminology used in each theory are not always interchangeable.

### *2.2.2 Rice (1992)*

Within Rice's (1992) theory (largely based on Clements 1990), a representation of segment structure contains the constituency nodes Place, Sonorant Voice (SV), Supralaryngeal (SL), Air Flow (AF) and Laryngeal (p. 62). These constituent nodes dominate the feature nodes of a segment, for example, SV dominates Lateral and Nasal. Each of the constituent nodes dominates an unmarked content feature which is unspecified in the underlying representation. Stop is unmarked for AF, Nasal for SV, Coronal for Place and Labial for Peripheral (p. 63). The unmarked feature of a node is inserted into the representation by a default rule at the phonetic interpretation level (p. 63).

For Rice, the amount of sonority a segment has is determined by how much SV structure it has. The more SV structure a segment has, the more sonorous it is (p. 66). This is illustrated below (from Rice 1992:65).

(12)

| liquid (/l/) | nasal | obstruent |
|---|---|---|
| ROOT | ROOT | ROOT |
| \| | \| | |
| SV | SV | |
| \| | | |
| Lateral | | |

Since the obstruent has the least amount of SV structure it is less sonorant than either the nasal or the liquid. The nasal in turn is less sonorant than the liquid. It should be noted that Rice adopts Clements' (1990) sonority hierarchy presented and discussed in the previous section.

Let's compare this definition of sonority to the one for consonantal strength presented earlier. Recall that consonantal strength was determined by the 'degree of deviation from unimpeded (voiced) air flow' (Vennemann 1988:8). This meant that voiceless stops were consonantally stronger than all other segments. This definition employs two phonetic features: voicing and degree of constriction. Rice on the other hand, defines sonority on the basis of how much SV structure a segment has. What exactly is meant by Sonorant Voice (previously referred to as Spontaneous Voice in Rice and Avery 1991)? Piggott (1992:48) defines Sponanteous Voice as '[a] vocal tract configuration in which the vocal cords vibrate in response to the passage of air'. This definition is similar to the one for consonantal strength however, the SV node dominates only the nasals and liquids in Rice's model.

Rice's (1992) segmental feature tree does not include the liquid /r/ or the glides. Although we will not discuss it at this point, it will become evident in the following chapter that a theory which includes both types of liquids and the glides is necessary in a reconstruction of consonant clusters in Proto-Romance.

Both Clements (1990) and Rice (1992) recognize the need to allow for language-specific constraints to override the basic principles of syllabification outlined in a theory of sonority. This requirement was briefly mentioned in the section on the Consonantal Strength hierarchy. In Clements' and Rice's theories, language-specific tendencies are explained as constraints on minimal sonority distance or place structure. These constraints will be explained in greater detail in chapter three. Murray and Vennemann too, must allow for language-specific syllable restrictions to influence how consonant clusters are syllabified. Those who would criticize either the Preference Law theory or sonority theory as being too unconstrained must recognize that not only in the realm of syllable structure but in other facets of language, language-specific restrictions may take precedence over universal principles.

One of the traditional principles of a syllabification theory is the Maximal Onset Principle 'which states that intervocalic clusters are normally divided in such a way as to maximize syllable onsets' (Clements 1990:300; cf. Bell 1977; Selkirk 1982). In all of the models discussed, including the Preference Law theory and the models presented by

Clements (1990) and Rice (1992), this principle is not a primitive of the theories but is instead derived from the tenets of the theories. That is, rather than stipulating that onsets must be maximized, the syllable structures are built in accordance with the theoretical constructs. In this way the most preferred onset is constructed as a natural consequence of the theoretical principles and not from an arbitrary stipulation.

Now that we have finished our comparison of consonantal strength and sonority, we return to the principles of the Preference Law theory.

### *2.3 Preference laws*

The first principle of the Preference theory we will look at is the Diachronic Maxim. It reflects the fact that diachronically, improvements generalize from the worst to the best syllable structures.[6] For example, in discussing the parameter relating to syllable heads, we can say that a less preferred syllable head will be improved before a more preferred syllable head.

(13) Diachronic Maxim
Linguistic change on a given parameter does not affect a language structure as long as there exist structures in the language system that are less preferred in terms of the relevant preference law.

Synchronically, a language will not contain structures that are less preferred without also containing structures that are more preferred.

(14) Synchronic Maxim
A language system will in general not contain a structure on a given parameter without containing those structures constructible with the means of the system that are more preferred in terms of the relevant preference law.

However, changes which operate along different parameters may alter the system so that there is not always an even transition from less preferred to more preferred structures. For instance, the tendency for unstressed vowels to be deleted often creates a less preferred structure in which two consonants come into contact. Therefore, change on one parameter may create a worse structure on another parameter. Thus a language system is never 'perfect'.

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[6]For an earlier discussion of the chronology of diachronic sound change see Foley (1977).

(15) Head Law
A syllable head is the more preferred: (a) the closer the number of speech sounds in the head is to one, (b) the greater the Consonantal Strength value of its onset, and (c) the more sharply the Consonantal Strength drops from the onset toward the Consonantal Strength of the following syllable nucleus.

Part (a) of the Head Law says that the number of segments will be reduced in a head with more than one speech sound, as shown in the Pāli example in (16), where consonant deletion in the syllable head has taken place.

(16) prajnā > paññā 'knowledge'

The most preferred head is one with the greatest consonantal strength according to (b) of the Head Law. Therefore, a weak syllable head is often strengthened. This has occurred with the glides shown in (17).

(17) Lt. i̯anuarius It. gennaio /dž/[7] 'January'
Lt. u̯iu̯ere It. vivere 'to live'

Head Law (c) states that the greater the slope of the head toward the nucleus, the more preferred the head. That is, the first member of the head should have a greater consonantal strength than the next member, if there is one, and the nucleus should be weaker still. For example, given that /t/ is stronger than /d/, a head containing *$tr* is more preferred than one with *$dr* since the slope is greater when the voiceless plosive is the initial member of the head rather than its voiced counterpart.

Classical Greek had syllable heads consisting of a nasal plus a liquid. Since the drop from a nasal to a liquid is very slight, this type of complex head is not preferred. To improve this condition either syllable head strengthening or consonant epenthesis occurred.

(18) +mro-tós > brotós (strengthening) 'mortal man'
cf. +á-mrotós > +ám$ro$tos > ám$bro$tos (epenthesis) 'immortal'

The next Preference law we will review is the Coda Law.

[7]I have tentatively placed the affricates with the plosives on the Consonantal Strength scale.

(19) Coda Law
A syllable coda is the more preferred: (a) the smaller the number of speech sounds in the coda, (b) the less the Consonantal Strength of its offset, and (c) the more sharply the Consonantal Strength drops from the offset toward the Consonantal Strength of the preceding syllable nucleus.[8]

Whereas Head Law (a) stated that the preferred number of speech sounds in the head is one, Coda Law (a) states that zero speech sounds is preferred in the coda. Elimination of members of the coda word-medially and word-finally often takes place and is exemplified in the following Icelandic example.

| | | | | |
|---|---|---|---|---|
| (20) | hest+ur | hest+bak | hest+s | 'horse' |
| | /hɛs$tYr/ | /hɛs$bak/ | /hɛss/ | |

Because a weak coda is preferred, consonants in coda position tend to weaken rather than strengthen, opposite of what holds for syllable heads. Coda weakening is evident in some Spanish dialects.

(21) Sp. salas > dial. salah[9] 'halls'

Coda Law (c) is the inverse to Head Law (c). In a complex coda the strongest element should be the final speech sound of the group and the consonantal strength should drop from the final segment of the cluster toward the preceding nucleus. This means that a complex coda of *rt$* would be preferable to *rd$* (Vennemann 1988:27).

The final law we will look at is the Syllable Contact Law (SCL) which is the most crucial Preference law with regards to this paper.

(22) Syllable Contact Law
A syllable contact A$B is the more preferred, the less the Consonantal Strength of the offset A and the greater the Consonantal Strength of the onset B; more precisely-the greater the characteristic difference CS(B)-CS(A) between the Consonantal Strength of B and that of A.

Recall that the segments on the Consonantal Strength scale were given a numerical value. These are the values referred to in the SCL and the Syllable Initial Margin Law which will be discussed in chapter two.

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[8]While there might appear to be a conflict between Coda law (b) and (c), the conflict is only apparent. The Coda Law states that preferentially, there should be no coda, but if there is a complex coda then the offset should be stronger than any preceding consonant in the coda.

[9]/h/ patterns as a glide in terms of its consonantal strength.

Taking the consonantal values from the strength scale in (5), we see that a syllable contact of *r$t* yields an equation of 6 - 2 = 4, where CS(B) = t = 6 and CS(A) = r = 2. If the contact was *t$r*, the result would be -4, from 2 - 6. The larger the difference, the better the contact; therefore, the contact of *r$t* is preferred over *t$r* since it yields a higher output. The German example in (23) illustrates this.

(23) Wartha /var$tɑ/, but Tatra /tɑ$trɑ/

The first example, *Wartha* demonstrates a good syllable contact of *r$t* . However, the contact in the second example *Tatra* would be bad if it was syllabified as *t$r*. Since the cluster is tautosyllabic it is quite acceptable according to Head Law (c) (Vennemann 1988:41).

A summary of the types of possible sound changes which effect an improvement in a nonpreferred syllable structure is listed in the catalogue below (based on Vennemann 1988).

(24) Catalogue of Syllable Structure Motivated Sound Changes

I. Syllable Contact Changes:
   (a) Tautosyllabification: A$B > $AB
   (b) Gemination: A$B > A$AB
   (c) Coda Weakening: A$B > C$B, where C is weaker than A
   (d) Head Strengthening: A$B > A$C, where C is stronger than B
   (e) Epenthesis: A$B > A$CB, where C is stronger than A
   (f) Anaptyxis: A$B > AV$B, where V is a vowel
   (g) Metathesis: A$B > B$A

II. Syllable Head Change:
   (a) Slope Steepening: $AB > $AC, where C is weaker than B

A, B, C indicate individual consonantal sounds. A is consonantally stronger than B.

We can see from this catalogue that there are a number of changes which may be implemented to improve syllable structure. While any number of these changes may be evident in a single language system, it is impossible for the linguist to predict which change will occur. What we can do, however, is identify the type of change which has occurred and then try to find an explanation for it. This is what we will be doing when examining these types of changes in the Romance languages.

Before we move on to the next chapter, it should be noted that the representation of syllable structure used in this work, e.g., VC$CV or V$CCV in (24) and elsewhere, is not meant to reflect a linear approach to syllable structure. In fact, I am assuming a non-linear

approach involving at least a segmental and syllabic tier (cf. van der Hulst and Smith 1982). Since the arguments presented in this thesis do not depend on a particular analysis of the syllable as hierarchically structured, for practical purposes and ease of exposition I will use the representation shown above, which is the device found in M & V (1983) and Vennemann (1988).

Having reviewed the main principles of the Preference Law theory, we now turn to the investigation of Proto-Romance syllable structure.

## Chapter Two

# SYLLABLE STRUCTURE MOTIVATED SOUND CHANGE IN ROMANCE

## 0. Introduction

In this chapter we will examine various phonological changes that have taken place in the history of Italian, Portuguese, Catalan, French, Spanish and Romanian.[10] Analyzing sound changes such as gemination, metathesis, glide strengthening, slope steepening and coda weakening within the Preference Law theory provides us with answers as to how consonant clusters were syllabified in the proto-language and also furnishes us with an explanation as to why these sound changes took place.

## 1. Italian[11]

### *1.1 Gemination*[12]

Modern Italian is well known for its phonemically long consonants. These geminates are usually represented orthographically in Italian, for example, *fatto* 'fact' versus *fato* 'fate'. In the first word the sequence of <tt> is long but in the second word the <t> is short. These long consonants are not always represented orthographically, however, as we can see in the word *figlia* [fiʎʎa] 'daughter'. Providing an explanation for the development of these geminates in Italian will give us an indication of consonant cluster

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[10]Except where otherwise noted, the standard form of the Modern Romance languages is used in the examples in this and subsequent chapters.

[11]The Italian examples are from Grandgent (1927) or Pei (1954) unless otherwise noted.

[12]The historical development of gemination in Italian is not equal to the synchronic gemination of Italian, that is, word-internal gemination in Italian cannot be equated to *Raddoppiamento sintattico* (Nespor and Vogel 1986:165-168 and 170-175; Saltarelli (1983) refers to this process as *Rafforzamento*). N & V describe the type of gemination which takes place across word boundaries as a resyllabification process within the phonological phrase which occurs when a short stressed vowel word-finally is followed by a word-initial consonant. Through resyllabification, the word-initial consonant also becomes the coda of the preceding syllable. This cannot explain the historical evolution of geminates in Italian however, since in words such as It. *bracciale* 'armband', Lt. *brăciāle*, which originally had a short, unstressed vowel preceding the word-internal consonant, there would be no explanation for the resyllabification according to N & V's analysis. Saltarelli (1983:19) explains diachronic gemination with his account of synchronic gemination which occurs when the coda of a branching rhyme is empty and reassociates to the following onset, creating ambisyllabic segments. Under this analysis, diachronic gemination is seen as an ameliorative process subsequent to consonant deletion. That is, once the coda of a syllable is deleted, leaving an unassociated C along the CV tier, the coda reassociates to the right creating a geminate consonant. This cannot not be generalized to all types of historical gemination however, since gemination did not only take place as a result of consonant deletion. The example he uses to illustrate his proposal, Lt. *rupta*, It. *rotta*, is traditionally considered an assimilation process, not a coda deletion process (Pei 1954:58).

syllabification in Proto-Romance. We begin by first examining gemination of consonants before the palatal glide.

| (1) | Latin[13] | Italian | | Proto-Romance | |
|---|---|---|---|---|---|
| a. | sēpia | sep$pia | (0) | p$i̯ (-8) | 'cuttlefish' |
| b. | rŭbĭa | rob$bia | (0) | b$i̯ (-6) | 'madder' (plant name) |
| c. | +pūtium | puz$zo | (0) | t$i̯ (-7) | 'stench' |
| d. | radium | rag$gio | (0) | d$i̯ (-5) | 'ray' |
| e. | brăciāle | brac$ciale | (0) | k$i̯ (-7) | 'armband' |
| f. | fugiat | fug$gia | (0) | g$i̯ (-5) | 'he flees (subj.)' |
| g. | tăliāre | tagliare [ʎ$ʎ] | (0) | l$i̯ (-2) | 'to cut' |
| h. | vindēmiam | vendem$mia | (0) | m$i̯ (-3) | 'grape harvest' |

The changes shown in (1) are taken to be the result of gemination and not assimilation for two reasons. First, if the yod was assimilating to the preceding consonant, then we would not expect the yod to remain as it does in most of these examples. Second, according to Vennemann's (1988) Strength Assimilation Law, it is usually the stronger segment which assimilates to the weaker (p. 35), which means that we should get a sequence of two palatal glides, which we do not. Therefore, I am assuming that the geminates result from a duplication of the consonant preceding the glide.

In terms of the Preference Laws for Syllable Structure, this gemination can be explained by assuming heterosyllabification of the consonant and the following glide, that is VC$i̯V. By referring to the Romance Strength scale presented in the previous chapter and by using the equation from the SCL, we can determine the contact evaluations shown to the right of the Italian and Proto-Romance columns. For example, prior to gemination the contact evaluation for the contact Vp$i̯V in (1a) is 1 - 9 = -8 in Proto-Romance, where 1 is the consonantal strength value of [i̯] and 9 is the value of /p/. Given the low contact evaluation, this syllable structure is not preferred. One way to remedy this is with gemination which creates a syllable onset equal in strength to the preceding coda, resulting in a more preferred syllable contact in Italian as shown by the higher contact evaluation. The Proto-Romance syllable contact of S$W (where S = strong and W = weak) became the more preferred S$S in Modern Italian.

Gemination occasionally occurred before the labial glide [u̯]. After gemination the glide was normally lost. As in (1) above, the examples in (2) suggest that the process involved is gemination and not assimilation since once again the Italian reflexes show two

[13]The Latin forms used in these and subsequent examples are for comparative purposes and are not to be construed as the direct source of the Romance forms.

strong segments and not two weak segments, contrary to what is expected given the Strength Assimilation Law described previously. In other words, if assimilation had taken place in *sapui* in (2a), we would expect **sa̯u̯i̯* in Italian, not *seppi*. As well, if the glide had assimilated to the previous consonant, then we would not expect it to remain in *acqua*. In all the other forms listed below, the glide disappeared after gemination because ill-formed syllable heads were created.

| (2) | Latin | Italian | Proto-Romance | |
|---|---|---|---|---|
| a. | sapuĭ | seppi | p$u̯ | 'I knew' |
| b. | habuĭ | ebbi | b$u̯ | 'I had' |
| c. | potuĭ | potti | t$u̯ | 'I could' |
| d. | +caduĭ | caddi | d$u̯ | 'I fell' |
| e. | aqua | acqua | k$u̯ | 'water' |
| f. | voluĭ | volli | l$u̯ | 'I wanted' |

One may ask why gemination could not have arisen from a syllable structure of V$CCV. In accordance with Coda Law (a), the Romance languages have a preference for open syllables, thus there would be no obvious motivation to insert another consonant in the coda position in order to create VC$CCV. However, the motivation for gemination can be determined from the SCL if we start with a heterosyllabic sequence. If we begin with VC$CV, we can see that gemination improves the syllable contact and at the same time creates a complex syllable head. Even though the complex head $CG is created, it is tolerated because it is the most preferred complex syllable head in terms of the slope of the head. In the case of the gemination in (2), the glide only remains after /k/ since only /k/ and /g/ may occur before /u̯/ tautosyllabically in Italian. The fact that some Preference Laws take precedence over others indicates that some syllable structures are more tolerable than others. In Italian, a preferred, complex syllable head is more acceptable than a poor syllable contact.

It has been claimed that these examples of gemination may in fact be of the type that occurred with learned words in Italian.[14] In some learned words a consonant geminated when it followed a stressed vowel of a proparoxytone, which is a word with antepenultimte stress (Grandgent 1927:84), e.g., Lt. *fēmĭnăm*, It. *femmina* 'female; woman'. However, this development cannot explain the gemination in non-learned forms, such as Lt. *apu̯u*, It. *appio* 'celery' (Boyd-Bowman 1980:115). If we examine the examples in (1) closely, we

[14]My thanks to Yves Charles Morin for bringing this to my attention.

can also see that gemination is not restricted to the consonant following a stressed syllable, as shown in *bracciale* and *tagliare*, which have stress following the geminated consonant.

Anderson (1984:317) has also claimed that word-internal gemination of the type shown in (1) only occurred after a stressed vowel. However, we can see in the examples in (1) that gemination occurred either after a stressed or unstressed vowel, as shown in Italian *séppia* and *bracciále*. This would seem to indicate that the position of word stress did not influence the development of geminates in Italian. It has also been suggested that the length of the vowel preceding the geminated consonant may have conditioned this change.[15] But once again we see that this cannot be the case given that gemination in Italian occurred following either a long or short vowel, as in Latin *sēpia* and *brăciāle*. Given that neither stress nor vowel length seem to have conditioned gemination in Italian, we are forced to find an alternate explanation. Syllable contact improvement provides us with the explanation once we reconstruct heterosyllabic consonant clusters for Proto-Romance.

### *1.1.1 Slope steepening*

Slope steepening is a process by which the second element of a syllable head weakens in order to make the slope steeper from the initial element in the cluster towards the following syllable nucleus. That is, the consonantal strength decreases from the initial segment of a consonantal cluster towards the following nucleus. A sequence of $pl becoming $pr or $pi̯ is an example of slope steepening. During its course of development, /l/ became [i̯] in Italian when it was preceded by a tautosyllabic plosive.

| (3) | Latin | Italian | Proto-Romance | |
|---|---|---|---|---|
| | plānum | piano | $pl | 'floor' |
| | clamo | chiamo | $kl | 'I call' |

The explanation of this process lies in Head Law (c). A syllable head of $ki̯ is more preferred than $kl since its slope towards the following nucleus is greater. Thus /l/ weakened to a palatal glide after a syllable-initial plosive in order to improve the slope of the syllable head.

Earlier I examined word-internal gemination before the glide [i̯]. Gemination of plosives also occurred word-medially before /l/ in Italian.

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[15]Michael Dobrovolsky, personal communication.

| (4) | Latin | Italian | Proto-Romance | |
|---|---|---|---|---|
| a. | dŭplum | dop$pio | p$l | 'double' |
| b. | ŏc(ŭ)lum | oc$chio | k$l | 'eye' |
| c. | sūb(u)lum | sub$bia | b$l | 'chisel' |

Since the weakening of /l/ to a glide only occurred after a syllable-initial plosive, we are led to believe that the correct original syllable structure in (4) is V$ClV. However, if we take as our starting point the heterosyllabic structure of p$l, k$l and b$l we get a clearer picture of the processes that were involved. First, a poor contact of VC$lV[16] was ameliorated by gemination which yielded VC$ClV. An example of this intermediate stage can be seen in dialectal Abruzzese *subbla* 'chisel' (Rohlfs 1966:348). This created the conditioning environment for slope steepening. If we begin by assuming that the plosive and the liquid are tautosyllabic we can account for slope steepening but not gemination. If on the other hand we start with a heterosyllabic structure, both gemination and slope steepening are explained.

Weakening of /r/ after a plosive did not occur in Italian: Lt. *primum*, It. *primo* 'first' (Murray 1987:125). Because a plosive + /r/ constitutes a fairly good syllable head, there was no need for improvement. Word-internally, slope steepening also did not occur after the voiceless stops:

| (5) | Latin | Italian | Proto-Romance | |
|---|---|---|---|---|
| a. | suprā | sopra[17] | p$r | 'above' |
| b. | petram | pietra | t$r | 'stone' |
| c. | lacrimam | lacrima | k$r | 'tear' |
| d. | fĕbrŭārĭus | febbraio | b$r | 'February' |
| e. | quadrata | quairata[18] | d$r | 'square' |
| f. | nigru | nair, neir[19] | g$r | 'black' |

As (5d-f) show, the voiced stops did undergo changes before /r/. In (5d) we see that /b/ geminated before /r/. As demonstrated above, gemination can be a means of syllable contact improvement when a strong coda is followed by a weaker onset. Also from our list of possible syllable structure motivated sound changes, coda weakening is another means

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[16]C denotes the plosives /p/, /k/ or /b/ here.

[17]As is shown by these examples, intervocalic voicing was not a regular sound change in Italian. In some instances voiceless plosives underwent intervocalic voicing, as in Lt. *patre*, It. *padre* 'father' and Lt. +*superanu*, It. *sovrano* 'sovereign; supreme' (Pei 1954:58, 61).

[18]Genovese dialect.

[19]Piedmontese dialect.

of improving a poor syllable contact. This is what appears to have occurred in (5e ) and (5f). Before /r/, both /d/ and /g/ weakened to yod. This type of change may take place when a strong coda is followed by a weaker onset.

While it appears that the voiceless stops underwent no change before /r/, I would argue that there was in fact a syllable contact improvement, namely tautosyllabification. That is, in order to improve the less preferred contact between the heterosyllabic voiceless stop and the weaker /r/, the voiceless stop became the onset of the following syllable, thereby improving the syllable structure. But how do we know that the voiceless stops + /r/ were in fact heterosyllabic when we have no direct evidence of this? Theory-internal evidence supports this claim. According to the Diachronic Maxim, improvement begins with the least preferred structures. Since the more preferred syllable contacts consisting of voiced stop + /r/ were improved by both coda weakening and gemination, we can infer that improvement must have already taken place with the less preferred structures, the voiceless stops + /r/. Therefore, if we accept the reconstruction of D$L in Proto-Romance to explain the sound changes shown in (5d-f), then we can assume that T$L also existed.

Additional evidence also indicates that both the voiced and voiceless stops were in coda position before syllable-initial /r/ in Proto-Romance. Recall that gemination affected clusters consisting of stop + yod or stop + /l/ in Italian. According to the SCL, the heterosyllabic cluster of stop + /l/ is more preferred than stop + /r/, which is more preferred than stop + yod. The Synchronic Maxim states that a language system will not contain less preferred structures without also containing more preferred structures on the same parameter. Therefore, the existence of heterosyllabic stop + yod in Proto-Romance, argued for on the basis of gemination in Italian, implies the existence of the more preferred heterosyllabic cluster of stop + /r/. Based on these pieces of evidence, we can reconstruct Proto-Romance clusters consisting of plosive + /r/ as heterosyllabic.

We have seen that in Italian, gemination regularly occurred when a plosive preceded a lateral liquid or a palatal glide but only occasionally took place before /r/, as in Lt. *fĕbrŭārĭus*, It. *febbraio*. Why did both -Cl- and -Ci̯- undergo gemination while -Cr- underwent tautosyllabification? The answer lies in the chronology of gemination and tautosyllabification. At an early stage in the development of Italian the very worst syllable contact, a plosive plus yod (VC$i̯V), underwent gemination in order improve the contact. Following this the next worst contact, a plosive plus /r/ (VC$rV), sustained a different but equally effective syllable contact improvement process, tautosyllabification. Finally, any remaining contacts that were deemed undesirable were once again improved upon. Thus

the contact between a plosive plus a lateral (VC$lV), the least undesirable syllable contact, underwent a second stage of gemination.[20]

The fact that the two stages of gemination are interrupted by an alternate process is not unusual. Newton (1972:41) calls this type of rule ordering 'interdigitation'. He states that 'what is intuitively a single phonological process is split into two parts by a second rule, so that we may symbolize the situation as $A^1BA^2$'. In Italian, two stages of gemination, typically thought of as a single phonological process, are broken up by an intermediate stage of tautosyllabification. Although we have different developments for different clusters, each of these processes ultimately achieves the same purpose: improvement of a nonpreferred syllable structure.

### *1.2 Differential developments in Italian*

Previously, Salverda de Grave (1930, hereafter S de G) argued that differences in syllable structure can explain the distinct developments of certain consonant clusters in Italian. For instance, he suggested that different syllabifications of *auricula* 'ear' could account for this word becoming both *origlia* 'eavesdrop' and *orecchio* 'ear' in Italian. S de G refutes Grandgent's (1927) claim that these separate developments were due to dialectal influences or that they arose through analogy. Instead, S de G claims (p. 323) that these diverse developments are due to differences in syllabification.

S de G (p. 323) explains the developments of Italian *origlia* and *orecchio* in the following manner. The word *origlia* developed from the consonant cluster of [-kl-] which was intervocalic and considered a single sound. Unfortunately, S de G offers us no explanation as to how *origlia* developed from this 'single' sound, thus providing us with no clue as to the word's development. He also does not account for the formation of the geminate [ʎʎ] in *origlia*. With *orecchio* he is no more precise. S de G argues that *orecchio* arose from a tautosyllabic cluster of $kl, which can account for the liquid becoming a palatal glide. What the author does not explain is why gemination also occurred. The analysis of gemination and slope steepening offered earlier, however, can account for both of these developments.

In the derivations below I show how both of these Italian words developed from the same etymon with the same syllable structure.

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[20]The change from t$l > t$tl did not occur in Italian as $tl is an unacceptable syllable head in any Romance language. As can be seen in Italian *vecchio*, Lt. *vĕtŭlus*, /t/ became /k/ before /l/ and then underwent gemination.

| (6) | a. | auricla | | b. | auricla | |
|---|---|---|---|---|---|---|
| | | k$l | | | k$l | |
| | | i̯$l | Coda Weakening | | k$kl | Gemination |
| | | i̯$ʎ | Palatalization | | k$ki̯ | Slope Steepening |
| | | ʎ$ʎ | Assimilation | | | |
| | | origlia | | | orecchio | |

In (6a) we see that the plosive in coda position has undergone coda weakening as a means of syllable contact improvement. The palatal glide which developed then palatalized the following liquid. Finally, the yod assimilated to the palatal liquid, producing the sequence [ʎʎ]. In the second example we have developments such as the ones we saw earlier. The plosive geminated before the weaker liquid in order to improve the syllable contact. The gemination in turn created a syllable head that was susceptible to slope steepening.

By reconstructing heterosyllabic clusters we can uniformly account for both of these developments as syllable contact changes. Wright (1982:23-30) argues that the existence of doublets in a language, such as *origlia* and *orecchio* in Italian, need not indicate the existence of two dialectal forms. Instead, he suggests that doublets may arise as a means of differentiating related words with different meanings. Since *auricula* came to have two discrete but related meanings, a way to maintain a distinction was to have each of the words undergo different phonological developments. This phonological distinction was a way to avoid the confusion which might have arisen had *auricula* developed in only one direction. As we have seen, separate syllable contact changes that affected *auricula* provided the necessary means to disambiguate the two words that derived from this single form.

### *1.2.1 Muta cum liquida*

Salverda de Grave (p. 327) argues that in the earliest stages of Romance a consonant plus a liquid were never heterosyllabic word-internally. I have tried to demonstrate with evidence from Italian that this statement is false. Earlier I mentioned that there was a difference in Romance between the syllabification of a word-medial consonant and /l/ and a consonant plus /r/. I argued that a consonant cluster containing /r/ was tautosyllabified in order to improve the syllable contact. Original heterosyllabification of this cluster in Proto-Romance must be posited on the basis of Italian examples such as

*fabbro,* Lt. *fabrum* 'blacksmith' (S de G:327) and *Affrica* [21] (< *Africa* ) (Pei 1954:61). In these words we see gemination of the consonant before /r/, a process which is argued to have occurred in a heterosyllabic environment.

Let's review some of the changes we have seen, starting with the worst syllable contact T$i̯, a voiceless plosive followed by a palatal glide. One way to improve this structure is with gemination as we have seen. Another way to improve a bad contact is tautosyllabification. In Italian tautosyllabification of the word-internal plosive did not occur when preceding /l/ but did occur before /r/ because a syllable-initial plosive plus /l/ ($Cl-) is less preferred than a syllable-initial plosive plus /r/, according to Head Law (c). After the initial stage of gemination of a plosive preceding yod, tautosyllabification of C$r took place. When tautosyllabification occurred with /r/, the first segments to resyllabify would be the voiceless plosives according to the Diachronic Maxim, since improvement always begins with the least preferred structures. After this stage of tautosyllabification another phase of gemination took place. In this second stage of gemination the remaining syllable contacts considered undesirable were eliminated starting with the worst sequence p$l. This sequence of events can explain the cases of gemination and tautosyllabification in Italian without making reference to differential syllabifications which S de G relies on. A summary of the changes I just described is shown below with the changes listed in the order they occurred.

Table 1

| Proto-Romance | Vp$i̯ | Vb$i̯ | Vp$rV | Vb$rV | Vp$l | Vb$l | |
|---|---|---|---|---|---|---|---|
| | Vp$pi̯ | Vb$bi̯ | -------- | -------- | ------- | ------- | Gemination 1 |
| | ------- | ------- | V$prV | -------- | ------- | ------- | Tautosyllabification |
| | ------- | ------- | -------- | Vb$brV | Vp$pl | Vb$bl | Gemination 2 |
| | ------- | ------- | -------- | -------- | Vp$pi̯ | Vb$bi̯ | Slope Steepening |
| Italian | Vp$pi̯ | Vb$bi̯ | V$prV | Vb$brV | Vp$pi̯ | Vb$bi̯ | |

In this section, I examined the processes of gemination and slope-steepening in Italian which indicated that a word-internal consonant cluster must have been divided as VC$CV in Proto-Romance. We also reviewed work from Salverda de Grave (1930) to show that only one type of syllabification is necessary to explain certain divergent

[21] *Affrica* occurs alongside *Africa* according to Pei (1954:61).

phonological developments in Italian. Next we will examine evidence from Portuguese which will provide further support for the reconstruction of heterosyllabic consonant clusters in Proto-Romance.

## 2. Portuguese[22]

Historical evidence from Portuguese also argues for heterosyllabic consonant clusters in Proto-Romance. The phonological processes of metathesis, coda weakening, and glide strengthening which occurred in the development of Portuguese can be explained as syllable structure improvements within the Preference Law theory.

### *2.1 Metathesis*

In Portuguese, a common way to improve a poor syllable contact was with metathesis. The glide moves from the syllable head position to the more preferred syllable coda position. In some of these examples the metathesis is concealed due to the coalescence of the original vowel with the yod.

| (7) | Latin | Portuguese | Proto-Romance | |
|---|---|---|---|---|
| a. | sēpĭam | siba | p$i̯[23] | 'cuttlefish' |
| b. | răbĭem | raiva | b$i̯ | 'rabies; rage' |
| c. | hŏdĭe | hoje[24] [ž] | d$i̯ | 'today' |
| d. | cavĕam | gaiva | v$i̯ | 'top, masthead' |
| e. | bāsĭum | beijo[25] [ž] | s$i̯ | 'kiss' |

In *siba*, for example, the derivation would be something like that shown in (8).

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[22]Data for the historical development of Portuguese comes from Williams (1962).

[23]I am following Hall (1976:148) and Williams (1962:33) in assuming that the segment following /p/ was in fact a palatal glide and not a full vowel in Portuguese.

[24]VL tonic [ɔ] + [i̯] > [o] or [oi] .

[25]Palatalization of /s/ also occurred (<j> = [ž] in Portuguese). There is disagreement on when the palatalization of the sibilant occurred. Pensado (1984) has claimed that palatalization took place prior to metathesis of the yod. Torreblanca (1988:345), however, claims that this scenario is unlikely. He presents evidence which indicates that metathesis of [-si̯-] occurred without prior palatalization. As this debate is not crucial to the topic at hand, I will not discuss it further.

(8) sēp$iam
p$i̯
b$i̯ Intervocalic Voicing
i̯$b Metathesis
si$ba Vowel Coalescence

siba

In some of the examples in (7), metathesis is concealed due to the palatalization which has taken place, for example in *hoje* and *beijo*.[26] However, we can deduce that metathesis did indeed occur due to the changes we see in the original vowels preceding the consonant + yod sequence, as indicated in the various footnotes below. Y-C Morin (p.c.) has suggested that the diphthong of Portuguese *beijo* might have resulted from regressive palatalization and not metathesis (cf. Jacobs 1991). Morin mentions that for French *raisin* 'grape' (< [ra̯dʒimo] < [radʒemo]/[radʒimo] < [ratʂemo]), Lt. *racēmŭm*, one must assume regressive palatalization in order to account for the diphthong. However, the difference between this French example and those in (7) is that all of the forms in (7) consist of a consonant followed by yod, not a nuclear vowel as in the case of *racēmŭm*. Therefore, it may be the case that regressive palatalization can account for the development of a yod where none existed before and in other cases, as in (7), the diphthong resulted from metathesis.

Additional support for metathesis comes from the development of consonants before the labial glide.

| (9) | Latin | Portuguese | Proto-Romance | |
|---|---|---|---|---|
| a. | sapŭit | soube[27] | p$u̯ | 'I/he knew (pret.)' |
| b. | pŏtŭit | pôde[28] | t$u̯ | 'he/she could (pret. indic.)' |
| c. | placŭit | prougue | k$u̯ | '?' |
| d. | ĕquam | égua > dial. euga | k$u̯ | 'mare' |
| e. | habŭit | houve | b$u̯ | 'I/he had (pret.)' |

The development of *houve* would be something like this: *hab$u̯it* > *hav$u̯it* (frication of /b/) > *hau̯$ve* > *houve* [ove]. If the clusters in (9) were in fact tautosyllabic, we would not expect the metathesis in (9d) since the syllable head $gu̯ is acceptable in Portuguese.

[26]Portuguese *hoje* in (7c) is considered to be the result of palatalization of /d/ and not for example, the deletion of /d/ in coda position, based on the fact that in words in which /d/ was lost before yod, such as Lt. *radium*, Pg. *raio* 'ray', no such palatalization took place (Williams 1962:80).
[27]VL tonic [a] + [u̯] > [o] .
[28]VL tonic [ɔ] + [u̯] > [o] .

But if we reconstruct heterosyllabic clusters instead, the metathesis before the labial and palatal glides can both be explained as syllable contact improvements.

## 2.2 *Coda weakening*

Another common development in Portuguese was the weakening of an intervocalic plosive before a lateral liquid.

| (10) | Latin | Portuguese | Proto-Romance | |
|---|---|---|---|---|
| a. | apĭc(ŭ)lam | abelha | k$l | 'honey bee' |
| b. | rŏt(ŭ)lum | +roclam > Pg. rôlha[29] | t$l | 'cork' |
| c. | tēg(ŭ)lam | telha | g$l | 'tile' |
| d. | fab(ŭ)lāre | falar (< fallar < fablar) | b$l | 'to speak' |

A possible derivation for *abelha* is given below.

| (11) | | |
|---|---|---|
| | apĭc(ŭ)lam | |
| | apic$lam | Vowel Deletion |
| | abig$lam | Voicing |
| | abi̯i̯$lam | Coda Weakening |
| | abi̯i̯$ʎa | Palatalization |
| | abe$ʎa | Misc. Vowel Changes |
| | abelha | |

When a plosive appeared intervocalically, it underwent voicing or frication as shown in (12). Word-initial plosive + lateral liquid clusters also evolved differently from word-internal clusters by undergoing slope steepening. This is demonstrated in (13).

| (12) | Latin | Portuguese | Proto-Romance | |
|---|---|---|---|---|
| a. | lŭpum | lôbo | VpV | 'wolf' |
| b. | natam | nada [ð] | VtV | 'nothing' |
| c. | amĭcum | amigo [g] | VkV | 'friend' |
| d. | habēre | haver [v] | VbV | 'to have' |
| e. | legūmen | legume [ɣ] | VgV | 'bean' |

| (13) | | | | |
|---|---|---|---|---|
| a. | clavem | chave [š] | $kl | 'key' |
| b. | blandum | brando | $bl | 'bland' |

[29]Recall that Romance [-tl-] normally became -[kl-].

If we assume that the plosives in (10) form a complex syllable head with the following liquid, the weakening they undergo is unexpected when compared to their development in other similar environments. The assimilation of the voiced labial plosive in (10d) is even more peculiar if we assume that the plosive and liquid are tautosyllabic. Hooper (1976:200) states that assimilation is more likely to occur at the end of a syllable rather than at the beginning; that is, between a coda and onset rather than within a complex onset, e.g., Sp. *un huevo* [uŋweβo] 'an egg' vs. *nuevo* [nweβo] 'new'. If the plosives in (10) were indeed tautosyllabic with the following /l/ we might expect developments similar to those in (12) or (13); that is, intervocalic voicing or frication or slope steepening but not coda weakening. Once again we must conclude that these intervocalic word-internal clusters were heterosyllabic and underwent coda weakening in order to improve the poor syllable contact evident in Proto-Romance.

Now let's turn to the development of consonants before the central liquid /r/ in Portuguese.

| (14) | | Latin | Portuguese | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | aprĭlem | abril | VprV | 'April' |
| | b. | pĕtram | pedra | VtrV | 'stone' |
| | c. | lacrĭmam | lágrima | VkrV | 'tear' |
| | d. | fĕbrem | fevre[30] (old and pop.) | VbrV | 'fever' |
| cf. | e. | intĕgrum | inteiro[31] | VgrV | 'whole, entire' |

Once again it appears that when a plosive precedes /r/ the cluster is tautosyllabic rather than heterosyllabic. The preference for a plosive-liquid cluster to be either hetero- or tautosyllabic is dependent upon the strength of the plosive and the strength of the liquid. This preference is based on the Syllable Contact Law and the Syllable Initial Margin Law (Murray 1987:120).

(15) Syllable Initial Margin Law
The preference for a syllabic structure $AB, where a and b are the consonantal strength values of A and B respectively, increases with the value of a minus b.

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[30]The Portuguese form *frágua* 'furnace' (< +*frauga* < +*fravga* < *fravega* < Lt. *fabrĭcam*) shows not only the intervocalic frication of /b/ > [v] but also shows metathesis of /r/. What it also shows is the metathesis of the [u̯], that is, +*frauga* > *frágua*. Given that the form +*frauga* seems to represent an ideal syllable contact, a weak coda followed by a strong onset, there appears to be no motivation for this metathesis. The answer could lie in the fact that this word is a borrowing from Spanish and thus does not represent the regular development of this sequence in Portuguese (Williams 1962:89).

[31]Where [-gr-] remains, or where [-kl-] and [-gl-] become [-gr-], these words are semi-learned or borrowings according to Williams (p. 77).

Similar to Head Law (c), the Syllable Initial Margin Law states that a complex syllable head should consist of a stronger onset followed by a weaker segment followed by an even weaker nucleus. The less a syllable head fulfills this requirement, the more likely it is for an improvement to occur. Using the strength values from the Romance Strength scale we can calculate the contact and initial margin evaluations for sequences of a plosive plus /l/ or /r/. These evaluations are indicated in Table 2.

Table 2[32]

| Contact | Evaluation | Initial Margin | Evaluation |
|---|---|---|---|
| | Least Preferred | | |
| p$r | -7 | $gl | 3 |
| p$l | -6 | $gr | 4 |
| k$r | -6 | $dl | 3 |
| k$l | -5 | $dr | 4[33] |
| t$r | -6 | $bl | 4 |
| t$l | -5 | $br | 5 |
| b$r | -5 | $tl | 5 |
| b$l | -4 | $tr | 6 |
| d$r | -4 | $kl | 5 |
| d$l | -3 | $kr | 6 |
| g$r | -4 | $pl | 6 |
| g$l | -3 | $pr | 7 |
| | Most Preferred | | |

Both the contact and initial margin columns show the least preferred sequences starting from the top and going downward toward the most preferred sequences. What this table shows in relative terms is that an intervocalic plosive + /r/ sequence is preferentially tautosyllabic ($Cr), while an intervocalic plosive + /l/ sequence is preferentially heterosyllabic (C$l). That is, when one compares a sequence of a plosive plus /r/ to a sequence of a plosive plus /l/, $Cr is preferred to $Cl and C$l is preferred to C$r.

This table also shows that of all the plosives, /g/ makes the worst syllable head because of its low consonantal strength. Thus it is not entirely unexpected that it remains in the coda position in Lt. *intĕgrum*, Pg. *inteiro,* while the other plosives appear in the head position. Given the low consonantal strength of /g/ in comparison with the other plosives, if the voiced velar was to resyllabify and become tautosyllabic with the following /r/, a

[32]Based on Murray (1987:128).

[33]Even though /d/ and /g/ have the same consonantal strength, /g/ as an onset is less preferred given that velars are argued to be inherently weaker than dentals (Foley 1977:33).

relatively poor syllable head would be the result. If the /g/ originated in coda position this would explain the coda weakening as opposed to frication in *inteiro*. From this we can see that while /g/ remained in coda position and subsequently weakened to yod, the other plosives became tautosyllabic with the following /r/. Both processes resulted in an improvement of the syllable stucture.

The Portuguese example *dobrar* 'to duplicate', Lt. *duplāre* appears to be an exception to the forms in (10) since it exhibits word-internal slope steepening which indicates tautosyllabification of the cluster instead of heterosyllabification. However, if we compare this form to Portuguese *doble* 'double', Lt. *dŭplus*, we see a different pattern. In the second example *doble,* word stress preceded the plosive-liquid cluster. As stressed syllables tend to attract segments (Allen 1973), this syllable was most likely closed by the plosive, e.g. V́C$CV. Since *dobrar* originally had stress following the plosive-liquid cluster, the likely syllable structure was V$CCV́. In these words stress placement seems to have influenced syllabification, which in turn played a role in the divergent development of these identical clusters. The derivation of these words illustrates how stress influenced their developments.

| (16) | a. dŭ́p$lus | b. du$plā́re | |
|---|---|---|---|
| | ---------- | du$prar | Slope Steepening |
| | dub$lu | du$brar | Voicing |
| | dob$le | do$brar | Misc. Vowel Changes |
| | doble[34] | dobrar | |

## *2.3 Glide strengthening*

Yet another means of improving a sequence of VC$CV where the coda is stronger than the head is head strengthening. In the following Portuguese examples the labial glide strengthened to a fricative in order to improve the syllable contact.

| (17) | Latin | Portuguese | Proto-Romance | |
|---|---|---|---|---|
| a. | valu̯isset | valv̯esse | l$u̯ | 'be strong (3rd. sg., pluperf. subj.)' |
| b. | +dolu̯erunt | dolv̯eron | l$u̯ | 'grieve (3rd. pl., fut. perf. pass.)' |

[34]The regular develpment of /-bl-/ > [-ll-] > [l], as in *falar*, would have occurred at a stage prior to voicing, therefore, we do not get the development *dŭp$lus* > **dub$le* > **dul$le* > **dole* in Portuguese.

Because the consonantal strength of the glide is weaker than the preceding coda, the glide's consonantal strength increases by becoming a consonantally stronger fricative.

### *2.4 Potential gemination*

Lloyd (1987:260) has suggested that the voiceless velar may have undergone gemination before yod in Ibero-Romance if not all of Western Romance. This gemination would explain the lack of intervocalic voicing we see in examples such as Lt. *facĭem*, Pg. *face* [s] 'face'.[35] The lack of voicing in this example parallels the development of words in which the voiceless velar + yod following a consonant remained unvoiced, as in Lt. *bracchĭum*, Pg. *braço* [s] 'arm' (Williams 1962:79). Gemination may also account for the lack of voicing we see in Pg. *poço* 'well', Lt. *pŭtĕum*, in which the voiceless dental stop develops into the voiceless fricative [s]. While the gemination explains the lack of voicing in examples such as these, and we can explain the gemination as a means of syllable contact improvement, as yet we do not have written records to verify this gemination in Portuguese.

In this section I have tried to show that phonological processes in Portuguese such as metathesis, coda weakening and glide strengthening can give us an indication as to earlier syllable structure. Judging by the evidence, there is strong reason to believe that Proto-Romance had heterosyllabic intervocalic consonant clusters. In the next section I will present data from Romanian which provides further evidence for this hypothesis.

## 3. Romanian[36]

### *3.1 Slope steepening*

In Romanian, the lateral liquid weakened to yod after a word-initial velar plosive.

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[35]Not all instances of intervocalic /k/ plus yod remained voiceless, however. For example, in Lt. *judĭcĭum*, Pg. *juizo* [z], the plosive did voice. The irregular results of the voiceless velar plosive makes it difficult to construct a precise course of development.

[36]The examples in this section are from Hall (1976), Du Nay (1977) or Nandris (1963).

| (18) | | Latin | Romanian | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | clavem | cheie | $kl | 'key' |
| | b. | glanda | ghindă | $gl | 'acorn' |
| cf. | c. | plāga | plagă | $pl | 'wound' |
| | d. | blasphēmo | blestema[37] | $bl | 'to curse' |
| | e. | flōre- | înflori(re) | $fl | 'to flower' |

Word-initially, only the velar plosives + /l/ underwent slope steepening. In Table 2 we saw that $pl made a better complex head than $kl or $gl. This is because /p/ has a greater consonantal strength than these other segments and is more tolerable as the initial segment of a complex head. As indicated by the Diachronic Maxim, the structures with the worst values ($kl and $gl) will be altered prior to more preferred structures ($pl). However, we still have to account for why $bl and $fl did not also undergo improvement. According to the Romance Strength scale, velars are weaker than dentals and labials which means that heads consisting of velar + /l/ may be less tolerable than dental or labial + /l/. This may explain why we see slope steepening after the velars but not after the labials.

### *3.2 Tautosyllabification and coda weakening*

Once again we see slope steepening only affecting the velar plosive-liquid clusters, this time word-internally.

| (19) | | Latin | Romanian | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | oricla | ureche | k$l | 'ear' |
| | b. | vigilāre | veghea | g$l | 'to watch' |
| | c. | vetulu- | vechiu | t$l[38] | 'old' |
| | d. | duplus | duplu | p$l | 'double' |

In these examples we see several developments. In (a), (b) and (c), /l/ weakened to [i], palatalized the preceding plosive and then was effaced. In (d) both the plosive and the liquid remain. These differential developments can be explained as syllable contact improvements.

The slope steepening in the Romanian forms *ureche* and *veghea* suggest that the velar plosive-liquid clusters were tautosyllabic. However, by examining sound changes in other plosive-liquid clusters which indicate heterosyllabification, we can see that the velar plosive-liquid clusters must have also been originally heterosyllabic. In the examples

[37]North or Daco-Romanian.
[38]/-tl-/ > /-kl-/.

below, we can see that when the voiced labial plosive was followed by a liquid, the stop weakened to a glide. Dialectally /d/ before /l/ weakened to /r/.

| (20) | Latin | Romanian | Proto-Romance | |
|---|---|---|---|---|
| a. | stab(u)lu | staul | b$l | 'stable' |
| b. | Rom. povidlă | povirlă[39] | d$l | '?' |

The weakening of the plosives in (20) indicates that the consonants were in coda position as this type of weakening is not expected if a consonant is in the onset position of a syllable. We have seen in Table 2 that d$l and b$l make better contacts than k$l and p$l. And according to the Diachronic Maxim, language change begins with the least preferred structures. The syllable contact improvement of b$l and d$l implies that k$l and p$l, two less preferred contacts, have already undergone some type of contact improvement. Judging by the developments in (19), we can argue that the clusters /-kl-, -pl-/ underwent tautosyllabification as a means of improving the syllable contact.

According to Table 2, the chronology of improvement would have gone something like this (from less preferred to more preferred): p$l > k$l > b$l > d$l > g$l (> indicates 'before' here). This means that there was likely an initial stage of tautosyllabification followed by a stage of coda weakening. Finally, the remaining nonpreferred contacts, in this case g$l, underwent a further stage of tautosyllabification as indicated by the slope steepening. These developments are indicated below.

| (21) | Proto-Romance: | dup$lu | orik$la | stab$lu | vig$lāre |
|---|---|---|---|---|---|
| | Tautosyllabification I: | du$plu | ori$kla | -------- | ---------- |
| | Coda Weakening: | --------- | --------- | stau̯$lu | ---------- |
| | Tautosyllabification II: | --------- | --------- | -------- | vi$glare |
| | Slope Steepening: | --------- | ori$ki̯a | -------- | vi$gi̯a |
| | Romanian: | duplu | oreche[40] | staul | veghea[41] |

The examples below show the development of stops before /r/ in Romanian.

[39]Colloquial Romanian.

[40]The palatalization of [k] and [g] does not appear to be an act of progressive assimilation; that is, these two plosives were palatalized by the following yod (< /l/) and not the preceding front vowel. This is shown by the fact that examples such as Rom. *mic* 'small' (Lt. *micu* ), Rom. *frig* 'cold' (Lt. *frigu* ), do not show palatalization of the velar when it is preceded by a front vowel ( see Nandris 1963:146, 150) .

[41]While palatalization of /l/ > [i̯] does take place when /l/ is syllable-initial, e.g., Lt. *linu*, Rom. *in* 'flax', Lt. *lĕpore*, Rom. *iepure* 'rabbit, hare' (see Nandris:140), this change only occurs when /l/ is followed by /i/; therefore, it appears that this is a case of assimilation and not a syllable structure motivated sound change.

| (22) | Latin | Romanian | Proto-Romance | |
|---|---|---|---|---|
| a. | capra | capră | p$r | 'goat' |
| b. | utre | [utri] | t$r | 'leathern bottle' |
| c. | acru | acru | k$r | 'bitter' |
| d. | februāriu | [fəurar] | b$r | 'February' |
| e. | nigru | negru | g$r | 'black' |

In these examples we can see that there was usually no change in the plosive before /r/. A comparison of Italian and Romanian syllabification shows that in Italian, VT$rV > V$TrV while VT$lV remained. In Romanian though, tautosyllabification affected both types of liquids; that is, VT$LV > V$TLV. Again, implicational evidence from within Romanian, illustrated in the syllable contact changes before /l/ and also before /i̯/ (shown below), require us to reconstruct VC$rV in Early Romance.

### *3.3 Metathesis*

In Romanian, metathesis took place when a palatal glide was preceded by a labial consonant. We have seen that this type of metathesis occurs when a strong coda was followed by a weaker onset as a means of syllable contact improvement.

| (23) | Latin | Romanian | Proto-Romance | |
|---|---|---|---|---|
| a. | scabia | zgaibă[42] | b$i̯ | 'boil' (noun) |
| b. | diffamiat | defăima | m$i̯ | 'defamation' |
| c. | cofea | coif | f$i̯ | 'helmet' |

Once again we are provided with evidence for VC$CV in Proto-Romance.

There are many processes which conspire to create a more preferred syllable structure. The processes reviewed above, slope steepening, coda weakening and metathesis, can be uniformly explained as syllable structure improvements once we reconstruct heterosyllabic consonant clusters for Proto-Romance. Next we examine phonological developments in Catalan which also indicate how word-internal consonant clusters should be syllabified in the proto-language.

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[42]Old Romanian.

## 4. Catalan[43]

### *4.1 Metathesis*

As we have just seen, a productive means of improving a poor syllable contact is metathesis. This is demonstrated in the examples from Catalan below where the yod moves to the coda position of the preceding syllable. After metathesis the two consonants occupy more preferred syllable positions.

| (24) | Latin | Catalan | Proto-Romance | |
|---|---|---|---|---|
| a. | bāsium | bes [bes] | s$i̯ | 'kiss' |
| b. | cŏrium | cuir [kui̯r] | r$i̯ | 'leather' |

As shown in (24a), the yod and preceding vowel sometimes coalesced after metathesis transpired, depending on the quality of the vowel (see Huber 1929; Fouché 1980).

Earlier I argued against Morin's (p.c.) suggestion that the diphthong of Portuguese *beijo* might be a result of regressive palatalization and not metathesis (cf. Jacobs 1991). The evidence from Catalan provides additional evidence for metathesis. In Catalan, /s/ did not palatalize in the environment of yod, that is, it remained /s/ unlike the situation in Portuguese in which /s/ became [ž] in the same environment (Torreblanca 1988:343-344). Therefore, it would be difficult to argue that the yod we see in the Catalan example above originated from a palatalized consonant. If the glide of the diphthong did not come from a palatalized consonant then we are able to posit metathesis as a viable alternate solution. Furthermore, we can account for the metathesis as a means of creating a more preferred syllable contact.

### *4.2 Coda weakening*

Coda weakening was also utilized in Catalan as a means of improving the syllable contact.

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[43]The Catalan examples are from Meyer-Lübke (1935), Hall (1976) or Fouché (1980) unless otherwise noted.

| (25) | Latin | Catalan | Proto-Romance | |
|---|---|---|---|---|
| a. | ŏc(ŭ)lum | ull [uʎ] | k$l | 'eye' |
| b. | vĕtŭlum | vell [beʎ] | t$l (> k$l) | 'old' |
| c. | cŏāgŭlum | coall [koaʎ] | g$l | 'clabber' |
| d. | tăbŭlam | taula [tau̯lə] | b$l | 'table, board' |

Syncope of the medial vowel caused the plosive and liquid to come into contact, producing a less preferred syllable structure. To improve this situation the stops in examples (a) - (c) weakened to yod, palatalized the following liquid, then were lost. In *taula* the stop weakened to a labial glide which left the following consonant unchanged. The weakening of the stops to a glide produced a more preferred sequence of W$S as opposed to the original S$W sequence. Let's compare the development of word-internal stop-liquid clusters in (25) with the development of stops intervocalically (26) and followed by a lateral liquid word-initially (27).[44]

| (26) | Latin | Catalan | Proto-Romance | |
|---|---|---|---|---|
| a. | amīcam | amiga [ɣ] | VkV | 'friend (f.)' |
| b. | vītam | vida [ð] | VtV | 'life' |
| c. | legūmene | llegum [ɣ] | VgV | 'vegetable' |
| d. | fabam | fava [β] | VbV | 'bean' |

| (27) | | | | |
|---|---|---|---|---|
| a. | clavem | clau | $kl | 'key' |
| b. | glēbam | gleva | $gl | 'lump of earth' |

Intervocalically, the plosives underwent spirantization (26). After a word-initial velar stop, the liquid weakened to yod as a means of improving the slope of the syllable head (27).

The divergent development of the plosives in these three sets of examples suggests that the consonants were in different positions. The extensive weakening of the plosives in (25) as compared to (26) and (27), indicates that the plosives in (25) underwent coda weakening as a means of improving the syllable contact.

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[44]Catalan, like Italian, sometimes employed gemination as a means of improving a syllable contact of VC$CV.

| | Latin | Catalan | Proto-Romance | |
|---|---|---|---|---|
| a. | diabŏlus | diable [diabblə] | b$l | 'devil' |
| b. | tēgŭla | tecla [tekklə] | g$l | 'key' |

Although it has been pointed out to me (Y-C Morin, p.c.) that gemination in Catalan is a more recent phenomenon, the syllabification of VC$CV is still implied and is compatible with the reconstruction of VC$CV in Proto-Romance. The recent gemination in Catalan may be interpreted as a maintenance of the original Proto-Romance syllable structure.

### *4.3 Tautosyllabification*

While the syllabification of an intervocalic plosive plus a lateral liquid was heterosyllabic, that for a plosive plus /r/ appears to be tautosyllabic based on the intervocalic spirantization of the plosives.

| (28) | Latin | Catalan | Proto-Romance | |
|---|---|---|---|---|
| a. | supra | sobre [soβrə] | VprV | 'over, above' |
| b. | petra | pedra [peðrə] | VtrV | 'stone' |
| c. | +acrus | agre [aɣrə] | VkrV | 'sour' |
| d. | febre | febre [feβrə] | VbrV | 'fever' |
| e. | nigru | negre [neɣrə] | VgrV | 'black' |

The examples in (28) are comparable to those in (26) with both sets of plosives becoming fricatives. This indicates that the plosive-/r/ cluster was treated as tautosyllabic. However, when the plosive and liquid were heterosyllabic, coda weakening took place, as in (25). Since the /r/ is weaker than the /l/, it makes a worse syllable contact when preceded by a consonantally stronger segment. Because a heterosyllabic cluster of C$r is not preferred when the consonant in coda position is stronger, I suggest that tautosyllabification occurred in order to improve the structure, as we have seen in the other Romance languages. A complex head of $Cr (where C represents any plosive) is more preferred to $Cl according to the Head Law, so for this reason original C$l did not tautosyllabify. Instead, coda weakening took place. Both processes created more preferred syllable structures.

### *4.4 Glide strengthening*

In some sequences of plosive + yod, glide strengthening took place with subsequent coda deletion. We have seen previously that the strengthening of a syllable-initial glide is a way to improve the syllable contact when it is preceded by a stronger, heterosyllabic consonant.

| (29) | Latin | Catalan | Proto-Romance | |
|---|---|---|---|---|
| a. | rubeu | roig [ruʧ] | b$i̯ | 'red' |
| b. | podiu | [puʧ] | d$i̯ | 'hillock' |

The strengthening of the yod to an affricate in these examples is also seen word-initially in Catalan: Cat. *jove* [ǰoβə] 'young', Lt. *jŭvĕnis*. In order to improve the syllable contact even more, the stop in the coda position was effaced. The development of these words is shown below.

(30)

| | | |
|---|---|---|
| Proto-Romance: | rub$i̯u | pod$i̯u |
| Glide Strengthening: | rub$dǰu | pod$dǰu |
| Coda Deletion: | ru$dǰu | po$dǰu |
| Final Vowel Deletion: | rudǰ | podǰ |
| Final Devoicing: | ruťš | poťš |
| Misc. Vowel Changes: | ruťš | puťš |
| Catalan: | [ruťš] | [puťš] |

In other examples with this stop-glide cluster it seems that /i/ did not lose its syllabicity, and thus a form like Lt. *sepia*, Cat. *sepia* [sɛpiə] 'cuttlefish', remains trisyllabic. The vowel may have remained nuclear when following /p/ in order to prevent the creation of the nonpreferred contact p$i̯. Because the stop is syllable-initial, there is no need for contact improvement.

So far we have looked at phonological changes in Italian, Portuguese, Catalan and Romanian. In the next section, we will look at further examples from Spanish which also cause us to reconstruct heterosyllabic consonant clusters for Proto-Romance.

## 5. Spanish[45]

In this section we will examine various phonological changes in Spanish that can be explained most clearly as syllable structure motivated sound changes.

### *5.1 Coda weakening*

In some instances of plosive + /l/, the stop weakened to yod which consequently palatalized the liquid. For example, PR /okulu/ > /oklu/ > OSp. [oi̯lo] > [oʎo] > [ožo] > MSp. [oxo] (based on Lloyd 1987:253). In Spanish, the voiced sibilants merged with the voiceless sibilants which explains the voiceless reflexes in the examples below (Lloyd:268).

[45]Spanish examples are from Lloyd (1987) or Penny (1991).

| (31) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | vetulus | viejo[46] [x] | t$l (> k$l) | 'old' |
| | b. | oculu | ojo [oxo][47] | k$l | 'eye' |
| | c. | regula | reja [r:exa][48] | g$l | 'plowshare' |

The weakening of the plosive to a glide before /l/ is similar to the weakening that took place when a velar plosive occurred in coda position and was followed by another consonant. In the examples below, the weakening of the plosive to yod had the effect of palatalizing the following dental stop.

| (32) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | lectu | lecho | k$t | 'bed' |
| | b. | dērēctu | derecho | k$t | 'straight' |

We can also compare the developments of the plosive before /l/ with the development of the plosive intervocalically.

| (33) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | vīta | vida [ð] | VtV | 'life' |
| | b. | fīcu | figo [ɣ] | VkV | 'fig' |
| | c. | rēgāle | real [ø] | VgV | 'royal' |
| | d. | jugu | yugo [ɣ] | VgV | 'yoke' |

Intervocalically, the voiceless plosives became voiced and then subsequently spirantized. The voiced velar was either lost or also spirantized.[49]

By contrasting these three sets of developments we can see that the plosives involved are in three separate environments. Specifically, we can see that intervocalically the plosives evolved along a different line from plosives before /l/. The examples in (31) can be explained as coda weakening if we start with original heterosyllabic clusters. Given the poor syllable contact of a strong plosive followed by a weaker onset, the coda weakened to yod in order to improve the contact. This led to the palatalization of the lateral

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[46]The origin of the diphthong [ie] in *viejo* is controversial since this sequence normally monophthongized (Lloyd 1987:194). However, Lloyd feels that the development in *viejo*, with retention of the diphthong, represents the normal development.

[47]Via Old Spanish [oʎo] > [ožo] (Lloyd 1987:253).

[48]Via Old Spanish [r:eʎa] > [r:eža]. [r:] indicates a long [r].

[49]Lloyd (p. 236-237) states that there is not enough evidence to decide which of the outcomes of VgV is regular and so leaves the question unanswered. The matter of which development is regular is not relevant to the present topic and will not be discussed further.

which in turn later became the palatal fricative [ž]. The phonological development would be something like this: PR *oculu* > [ok$lu] > [oi̯$lo] > OSp. [oʎo] > [ožo] > MSp. [oxo]. If the plosives were intervocalic in this set of examples, this development would not be expected. Instead, we might expect the velar to become a fricative as in (33), but this did not occur.

When /b/ appeared before a lateral liquid in Spanish, two possible changes could occur. Either the plosive remained unchanged or assimilated to the following liquid. The reflex of /-bl-/ does not appear to be dependent upon where stress fell on the word. Comparing (34a) and (34b), we can see that /b/ was just as likely to remain if stress either followed or preceded the plosive-liquid cluster. Similarly, if we compare (34b) to (34c) we see that when stress preceded the cluster, /b/ could have remained unchanged or assimilated to the following liquid.

| (34) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | fābulāre | hablar | b$l | 'to speak' |
| | b. | nubilu | nublo | b$l | 'cloudy' |
| | c. | tribulu | trillo [ʎʎ] | b$l | 'spike-toothed harrow' |

The assimilation shown in (34b) is similar to that which we saw in Portuguese earlier, where Proto-Romance *fab$lar* (cf. Lt. *fab(ŭ)lāre* ) > *fallar* > *falar* 'to speak'. We mentioned then that assimilation is more likely to occur between a coda and an onset than within a complex onset (Hooper 1976:200). For this reason it was suggested that the plosive in this cluster was in the coda position. This also applies to (34b). The assimilation in (34b), with a possible intermediate stage of weakening to /β/ (Lloyd 1987:200), would create a better contact between the coda and the onset.

### *5.2 Tautosyllabification*

The reader will notice that in (34a) the plosive remained unchanged. This is also the case when a voiceless labial plosive appeared before /l/, disregarding the intervocalic voicing.

| (35) | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|
| | populu | pueblo | p$l | 'people' |

These two examples might suggest that we are not dealing with heteroysllabic clusters. However, as was just demonstrated, /b/ did sometimes undergo weakening in coda position by assimilating to the following /l/. From Table 2 we know that b$l is a more preferred contact than p$l by virtue of the fact that /b/ is consonantally weaker than /p/, therefore, is more tolerable in coda position if followed by a weaker onset. We also know that improvement always starts with the least preferred structures in a language. Since improvement has occurred in some instances of b$l this implies that improvement has already taken place with less preferred structures, such as p$l. Recall that a means of improving a poor syllable contact is through tautosyllabification. Based on these pieces of evidence, we may conclude that in these plosive-liquid clusters tautosyllabification occurred as a syllable contact improvement.

To find further support for the heterosyllabification of these clusters in Proto-Romance, let's examine the word-initial and postconsonantal developments of plosive-liquid clusters in Spanish.

### *5.3 Syllable head simplification and slope steepening*

When a voiced labial or voiced velar plosive appeared before /l/ in word-initial position, either the plosive remained (36) or was lost (37).

| (36) | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|
| a. | blandu | blando | $bl | 'smooth, soft' |
| b. | gloria | gloria | $gl | 'glory' |

According to Lloyd (p. 224) the words in which the stops remained are probably learned. The more regular development seems to be the loss of the word-initial plosive.

| (37) | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|
| a. | blatta | ladilla | $bl | 'crab louse' |
| b. | glandine | landre | $gl | 'tumour' |

Although Lloyd does not explain why the stops should be lost in (37), I would propose that they were lost as a means of syllable head improvement (cf. Murray 1987:125). Given that a syllable head consisting of either #bl or #gl is not preferred according to the Syllable Initial Margin Law, a way to improve the head is by deleting the plosive. Given that there is also a preference for the onset to be as consonantally strong as possible (Head Law (b)), it may seem strange that the plosive should be deleted over the liquid. However, this type

of complex head simplification is not unprecedented. In English, for example, #kn was reduced to #n, as in OEng. *cnāwan* > Mod.Eng. *know* (Pyles & Algeo 1982:179). As we can see, the strongest element of the complex head was deleted.

According to Lloyd (p. 225), the usual development of the plosives /p/ and /k/ and the fricative /f/ before /l/ word-initially was assimilation to the following tautosyllabic liquid which then became the palatal /ʎ/.

| (38) | Latin | Old Spanish | Proto-Romance | |
|---|---|---|---|---|
| a. | plōrāre | llorar [ʎ] | $pl | 'to weep' |
| b. | clamāre | llamar [ʎ] | $kl | 'to call' |
| c. | flamma | llama [ʎ] | $fl | 'flame' |

Lloyd (p. 224-225) states that the change started with the palatalization of the /l/ in the cluster /kl/. The backness of the velar caused the lateral to be retracted to the palatal area. This would lead to the creation of /kʎ/. The palatal articulation then spread to the other clusters /pl/ and /fl/. Support for this reconstruction comes from the conservative Upper Aragonese dialect in which the pronunciation of /pʎ, kʎ, fʎ/ is still maintained (Lloyd:226). Because this was a "heavy" articulation, the plosive dropped in Castilian leaving only the palatal lateral in initial position. This begs the question of why this pronunciation did not spread to the clusters /gl/, especially given the backness of the voiced velar. Lloyd does not address this question.

While Lloyd's reconstruction for Castilian seems to be supported by the fact that the Upper Aragonese dialect still maintains word-initial clusters consisting of a stop and a palatal lateral, his explanation for why the lateral should palatalize when following a word-initial velar seems phonetically unmotivated. Neither Bhat (1978) nor Lahiri and Evers (1991) mention velar consonants inducing palatalization in their examinations of palatalization processes.[50]

I would argue that the lateral did indeed weaken to a palatal ([ʎ]) in Spanish as Lloyd has suggested, but did so in order to improve the slope of the syllable head. Like the other word-initial clusters #bl and #gl, the initial segments /p, k, f/ were ultimately lost as a further step in improving the syllable head. Since #gl and #bl are two of the worst syllable heads with two of the lowest slope evaluations (see Table 2), head improvement would

[50]In discussing the cross-linguistic palatalization of liquids, Bhat (1978:71-72) states that laterals either become laminals (such as [ž]) or palatal vowels ([i̯]). Trills on the other hand tend to spirantize. These changes are said to occur in a *palatalizing* environment; that is, in the environment of a front vowel or palatal glide.

have started with these tautosyllabic clusters then spread to the other plosive-liquid clusters. The weakening of the lateral liquid to a palatal liquid suggests the need for a modified strength scale, at least for Romance, in order to show this difference in strength based on place of articulation. This would be contrary to Clements' (1990) and Rice's (1992) arguments to exclude place of articulation from the sonority scale. See chapter three for further discussion on this matter.

When the stops /p, k, f/ appeared after a consonant and before the liquid /l/, the result was the affricate [tš].[51]

| (39) | Latin | Spanish | | Proto-Romance | |
|---|---|---|---|---|---|
| a. | amplu | ancho | [tš] | C$pl | 'wide' |
| b. | conclāvāre | conchavar | [tš] | C$kl | 'to unite; hire the services of someone' |
| c. | inflāre | fenchir | [tš] | C$fl | 'to fill' |

Lloyd (1987) states that word-medially after a consonant a palatal has the tendency to affricate. Thus he again proposes that the lateral palatalized after the stop (presumably $kl was again the first to undergo the process) and it was the palatal which underwent affrication. I would again suggest that it was slope steepening that affected these tautosyllabic clusters just as we saw word-initially. After the liquid weakened to a palatal, the preceding consonant deleted in order to improve the syllable head. Once this occurred, the initial palatal strengthened to an affricate.[52]

I would like to briefly summarize what we have just seen. Word-initial plosive-liquid clusters either lost the original onset of the cluster (*landre*), became palatals (*llorar* ) or remained unchanged (*gloria*). Post-consonantally certain plosive + /l/ combinations became the affricate /tš/. Comparing these developments in which the plosive-liquids are in fact tautosyllabic with the developments in (34b) and (35) shows us that the clusters in (34b) and (35) are actually in different environments; that is, the clusters in (34b) and (35) are heterosyllabic. If these clusters were actually tautosyllabic then we might expect changes similar to the ones just discussed. Since this is not the case, however, we can again draw the conclusion that intervocalic consonant clusters were originally heterosyllabic.

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[51]In all these cases the affricate remained voiceless since it was not intervocalic.

[52]Williams (1962:63), like Lloyd, claims that /pl/ > /pll/ > [pʎ] > [pi̯] > [ptš] > [tš]. However, it seems unlikely that the yod would have strengthened to an affricate while still preceded by a tautosyllabic plosive since this would create an unacceptable syllable head and also would be highly unmotivated within the Preference Law theory.

## *5.4 Metathesis*

The development of certain segments before yod gives us further clues to the syllable structure of Proto-Romance.

| (40) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | sapiat | sepa[53] | p$i̯$ | 'know, pres. subj.' |
| | b. | fērrāriu | herrero | r$i̯$ | 'blacksmith' |
| | c. | bāsiu | beso | s$i̯$ | 'kiss' |

Metathesis improves a nonpreferred syllable contact by shifting the weaker onset into the coda position. Subsequent to the metathesis of yod, the glide usually coalesced with the preceding vowel. Harris-Northall (1990:18) states that once the stop shifted to the onset position voicing did not necessarily take place despite the stop being in an intervocalic position. He shows that stops often did not undergo voicing when following a glide. For example, Lt. *cautu*, Sp. *coto* 'enclosure; landmark' and Lt. *paucu*, Sp. *poco* 'little; few' (Harris-Northall:34, footnote 16).

In some words, clusters of Vp$i̯$V and Vr$i̯$V remained unaffected.

| (41) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | sēpia | jibia | p$i̯$ | 'cuttlefish' |
| | b. | cēriu | cirio | r$i̯$ | 'wax candle' |

The fact that these clusters did not undergo the normal development of metathesis implies that they may have been treated differently. It may be the case that the yod in these examples became nonsyllabic later than the ones in (40). In other words, the /i/ following the /p/ and /r/ may have retained its syllabicity longer, which would have exempted these examples from syllable contact improvements (cf. section 4.4 of this chapter).

In very old, archaic forms, metathesis can also be seen with the clusters /-l$i̯$-, -n$i̯$-/ in certain toponyms (Menéndez-Pidal 1968:278-279).

| (42) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | Valius + -enus | Bailén | l$i̯$ | 'Bailén' |
| | b. | Lucanius + -ena | Lucainena | n$i̯$ | 'Lucainena' |

[53]From Old Spanish [sa$i̯$pa].

Menéndez-Pidal (p. 279) says that the metathesis of the clusters in (42) must have taken place at a very early stage in order for palatalization not to have affected /l/ and /n/. Normally /l/ and /n/ became palatalized before yod. This will be discussed in more detail below.

Supporting evidence for the heterosyllabification of a consonant before yod can be seen in the examples below in which metathesis of the labial glide took place.

| (43) | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|
| a. | habui (> /áuβi/) | hube | b$u̯ | 'have, 1st pers. past indic.' |
| b. | sapui (> /sáupi/) | supe | p$u̯ | 'know, 1st pers. past indic.' |

Before the labiovelar glide, both labial stops underwent metathesis. Once again we can explain this change as a syllable contact improvement when we reconstruct heterosyllabic consonant clusters for Proto-Romance.

### *5.5 Gemination*

In Romance, intervocalic /ti̯/ and /ki̯/ normally became /ts/ and /tš/,[54] respectively (Penny 1991:54). In Old Castilian, the reflexes of intervocalic /ti̯/ and /ki̯/ merged into /ts/, which can be realized as either voiced ([dz]) or voiceless ([ts]) making it difficult to set up a regular sound correspondence (Lloyd 1987:261). As we can see in the examples in (44) and (45), stress does not appear to be a factor in determining the voicing of the reflex since primary stress could either precede or follow the stop and a voiced or voiceless reflex could still result. Both the voiced and voiceless reflexes of this affricate reduced to a fricative with [dz] becoming [z] and [ts] becoming [s] in Modern Spanish. These developments are illustrated below.

| (44) | Latin | Old Spanish | Proto-Romance | |
|---|---|---|---|---|
| a. | capitia | cabeça [ts] | t$i̯ | 'head' |
| b. | pōtiōne | poçón [ts] | t$i̯ | 'draught' |
| c. | faciē | ha[ts] | k$i̯ | 'face' |

[54]Lloyd does not discuss why the dental becomes a [+anterior] affricate while the velar becomes [-anterior]. Harris-Northall (1990), in his extensive review of the historical development of Spanish, mentions that there are several theories that have different intermediate stages between the original stop plus yod stage and the ultimate [+anterior] affricate stage. Since these divergent developments are peripheral to his work he leaves the discussion aside.

| (45) | | Latin | Old Spanish | | Proto-Romance | |
|---|---|---|---|---|---|---|
| | a. | ratiōne | razón | [dz][55] | t$i̯ | 'reason' |
| | b. | vitiu | vezo | [dz] | t$i̯ | 'habit' |
| | c. | corticea | corteza | [dz] | k$i̯ | 'bark, rind' |
| | d. | aciāriu | azero | [dz] | k$i̯ | 'steel' |

When the voiceless plosive appeared intervocalically before yod, the reflex usually remained voiceless as shown in (44). This voiceless reflex is also the one we see when /-ti̯-/ and /-ki̯-/ appear postconsonantally.

| (46) | | Latin | Old Spanish | | Proto-Romance | |
|---|---|---|---|---|---|---|
| | a. | martiu | março | [ts] | C$ti̯ | 'March' |
| | b. | calcea | calça | [ts] | C$ki̯ | 'breeches' |

This voicelessness has been explained as a gemination of the plosive before yod, cf., Lt. *faciē*, Fre. *face* 'face' (Lloyd 1987:260). It has been posited earlier that gemination was a means of syllable contact improvement. When a strong coda was followed by a weaker onset another consonant of equal strength was created in the following onset position to improve the syllable contact.

With regards to the voicing distinction, Lloyd (p. 261-262) says that it is likely that whenever /ts/ appears in Old Castilian it is derived from geminate /k/ or /t/ before yod in Late Latin (Wilkinson 1976 also makes this suggestion). That is, gemination of both /t/ and /k/ before yod explains the lack of voicing of the affricate intervocalically. But then how do we explain the voiced reflexes that are produced in the same phonetic environment? In response to this question, Lloyd (based on Malkiel 1971) suggests that there is a morphological distinction between those words with voiced reflexes and those with voiceless reflexes. He says (p. 262) that there are very few nonderived words which contain intervocalic /ti̯/ and /ki̯/. Most of the words which have reflexes of these clusters are instead derived words and the <z> or <ç> in question is usually in a suffix: verbal suffixes *-zar*, *-izar*; adjectival or substantival suffixes *-azo*, *-izo*; deverbal suffix *-azón*; substantival suffixes *-ez*, *-eza*, *-ece*, *-ice*, *-icia*, *-icie*. Malkiel (1971) says that since most derivational suffixes were voiced, these may have been the models on which the other suffixes in question also became voiced (Lloyd:262). This means that if a derivational

[55]In Spanish, the voiced sibilants merged with the voiceless before the sixteenth century, apparently under Basque influence (Lloyd:268).

suffix originally contained /ts/ it would have become /dz/ on the basis of these other regularly voiced derivational suffixes.

Lausberg (1965:387, 394) makes the claim that across the Romance languages /k/ generally geminated before yod and after degemination a voiceless consonant remained. With /t/, however, gemination before yod was not as widespread, thus we should see a voiced reflex in Romance. However, as we have already seen, Old Castilian does not fit neatly into this pattern since we do occasionally see gemination of /t/ before yod, which explains the voiceless reflexes of Vt̲i̲V (Lloyd:263).

### *5.6 Glide strengthening and coda weakening*

Word-initially, a palatal glide strengthened to a fricative before a back vowel in Old Spanish.[56] Head Law (b) predicts that this type of strengthening will occur as a means of improving the syllable head.

| (47) | Latin | Old Spanish | Proto-Romance | |
|---|---|---|---|---|
| | jūniu | junio [ǰ] or [ž] | $i̲ | 'June' |

When a voiced dental or velar preceded yod intervocalically, the stop in coda position weakened to yod then assimilated to the following midpalatal fricative [ǰ], which arose through strengthening of the syllable-initial glide (Penny 1991:55).

| (48) | | Latin | Old Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | podiu | po[ǰǰ]o > poyo [ǰ][57] | d$i̲ | 'stone bench' |
| | b. | fāgea | fa[ǰǰ]a > faya [ǰ] | g$i̲ | 'beech tree' |

In other instances, the voiced plosives weakened and were lost before yod. The yod coalesced with the preceding vowel.

| (49) | | Latin | Old Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | fastidiu | fastío | d$i̲ | 'loathing, disgust' |
| | b. | corrigia | correa | g$i̲ | 'leather strap' |

Both the glide strengthening and the coda weakening can be explained as syllable contact improvements. In (48), the yod in onset position strengthened to a fricative as a means of

[56]Before a front vowel the word-initial glide had a tendency to be effaced (see Lloyd 1987:249-252).
[57]This became modern Spanish *poyo,* where <y> varies dialectally from [i̲] to [ž] to [dž] (Penny 1991:93).

improving the syllable contact. To improve the contact further, the plosive in coda position weakened to a glide. After the plosive weakened to yod, the resultant yod assimilated to the fricative to form a geminate. The geminate sequence subsequently degeminated following the normal development in Spanish. For (48a) the development would be like this: [pod$i̯u] > +[pod$j̆o] > +[poi̯$j̆o] > OSp. +[poj̆$j̆o] > OSp. [poj̆o] > MSp. poyo (based on Penny 1991:55).

In the examples in (49), a different type of change occurred. Here the plosives weakened to yod and were lost. Because of this weakening, glide strengthening was not needed and instead the glide coalesced with the preceding vowel. Although we might expect only one type of improvement to affect one type of cluster, this is not always the case. In certain instances, a group of words with a certain segmental sequence undergoes a change separate from another group of words with the same set of sounds. A specific sound change may affect only a subset of possible targets. This has been described as Lexical Diffusion (Wang 1969; from Wright 1982:16-18). In the course of Spanish it appears that two changes occurred with V.di̯V and V.gi̯V. Both sets of changes, however, can be explained as syllable contact improvements and point to an earlier stage of heterosyllabification.

Let's compare the developments of intervocalic /-di̯-/ with postconsonantal /-di̯-/.[58]

| (50) | | Latin | Old Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | virdia | berça [ts][59] | C$di̯ | 'cabbage' |

Postconsonantally, we see that the stop and glide coalesced to form the affricate [ts] (> MSp. [s]). The separate developments shown in (48), (49) and (50) suggest that we are dealing with different syllable structures. Postconsonantally it is expected that the stop and yod would be tautosyllabic. Intervocalically we have evidence that this cluster was actually heterosyllabic. This heterosyllabicity thus explains the glide strengthening and the coda weakening evident in (48) and (49).

In some instances it appears that in a labial-glide sequence, the syllable-initial glide strengthened to a fricative with subsequent loss of the preceding labial consonant.

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[58]I was unable find an example of postconsonantal /-gi̯-/ to compare with intervocalic /-gi̯-/.

[59]Recall that in Castilian, by the end of the sixteenth century, the voiced sibilants merged with the voiceless sibilants, leaving only the set of voiceless sibilants (Lloyd 1987:268).

| (51) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | rubeu | royo ([ǰ] > [i̯]) | b$i̯ | 'reddish' |
| | b. | fovea | foya ([ǰ] > [i̯]) | v$i̯ | 'ditch' |

In other similar consonant + yod sequences, no obvious syllable contact improvements seem to have taken place.

| (52) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | rubeu | rubio | $bi | 'blond' |
| | b. | pluvia | lluvia | $vi | 'rain' |
| | c. | vindēmia | vendimia | $mi | 'harvest' |

In the examples in (51), we have more cases of glide strengthening with coda deletion. In syllable-initial position the glide strengthened to the fricative [ǰ] in order to improve the syllable contact. The consonant in coda position weakened and was effaced, which further improved the contact. The lack of a change in (52), however, suggests that the vowel following the medial consonant did not lose its syllabicity and remained a full vowel, therefore, no improvement was required. This explains the occurrence of the doublets *royo* 'reddish' and *rubio* 'blond' in Spanish. In modern allegro speech, however, the segment following the medial consonant in (52) is a glide.

It is commonly assumed that the sonorants /l/ and /n/ merely underwent palatalization before a following yod.

| (53) | | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|---|
| | a. | cilia | ceja [x] | l$i̯ | 'eyebrow' |
| | b. | cicōnia | cigüeña [ɲ] | n$i̯ | 'stork' |

Harris-Northall (1990:80) argues that in the first example the lateral first assimilated to the yod and became [ʎ], then the palatal 'delateralized' [60] and became the prepalatal fricative [ž]. Lloyd says (1987:244) that a lateral palatalized by a following yod became a fricative in order to avoid a merger with the Old Spanish palatal lateral which had evolved from geminate /ll/, as in Lt. *caballu*, OSp. *cavallo* [ʎ] > MSp. *cavallo* [i̯] 'horse' (Lloyd:243). Lloyd states (p. 244) that this type of merger took place with palatal /n/. That is, Latin /nn/ degeminated and became [ɲ] to maintain its "strong" articulation, e.g., Lt. *annu*, OSp. *anno*

[60]Labelling this change as 'delateralization' is misleading because the lateral would not only have to lose its lateral articulation but would in addition have to become retracted in order to become a palato-alveolar fricative.

[ɲ] > MSp. *año* [ɲ] 'year' (Lloyd:244). As we see in (53b), /n/ before yod also becomes a palatal. This leads us to wonder why the nasal could merge with the reflex of its geminate counterpart but the lateral could not. Lloyd does not answer this question. Penny (1991:55) also questions Lloyd's hypothesis based on the fact that the Eastern Hispano-Romance dialects, such as Aragonese and Catalan, do have a merger of the reflexes of /l/ plus /i̯/ and /ll/.

Rather than both /l/ and /n/ palatalizing before yod, I would suggest that in the sequence Vli̯V, the yod strengthened to a fricative and the preceding coda was lost. The glide strengthening would be motivated by the need to improve the poor syllable contact. This type of glide strengthening does not seem to have occurred after intervocalic /n/, however. This is not completely unexpected given that nasals appear to be more susceptible to palatalization than laterals (see Bhat 1978:71). It would appear that in Spanish, the complete palatalization of the dental nasal eliminated the need for syllable contact improvement.

### *5.7 Tautosyllabification*

The sequence of intervocalic plosive + /r/ seems not to have undergone any syllable contact improvements judging by the developments we see below. Before /r/ the voiceless plosives became voiced.

| (54) | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|
| a. | capra | cabra | p$r | 'goat' |
| b. | petra | piedra | t$r | 'stone' |
| c. | alacre | alegre | k$r | 'merry' |
| d. | rōb(o)re | roble (< OSp. robre) | b$r | 'oak' |
| e. | hedera | hiedra[61] | d$r | 'ivy' |
| f. | nigra | negra | g$r | 'black' |

There does seem to be some indication that when /g/ was followed by /r/ intervocalically, the plosive weakened to a yod and was lost.[62]

| (55) | Latin | Spanish | Proto-Romance | |
|---|---|---|---|---|
| | integru | entero | g$r | 'whole' |

[61]The University of Chicago Spanish-English dictionary actually gives both *yedra* and *hiedra* for Modern Spanish 'ivy'.

[62]Lloyd (1987:237) contends that the divergent developments of /-gr-/ indicate that a single sound change cannot be set up for this sequence.

These developments closely parallel those we have previously seen in the other Romance languages. Word-medial stops before /r/ tend not to show any syllable structure motivated sound changes. However, I argued before that a cluster consisting of a plosive plus /r/ actually underwent tautosyllabification as a way to improve the poor syllable contact. The weakening of the voiced velar before /r/ in (55) can be taken as an indication that the stop was in the coda position and that coda weakening was employed as a means of improving the poor syllable contact. Lloyd (p. 237) himself has suggested that the reason /g/ was lost in Spanish *entero* was possibly due to a difference in syllabification. When the velar was in coda position it weakened to a yod and subsequently coalesced with the preceding vowel. This was not the case with Spanish *negra* however, and the velar remained. Since either loss or retention of the voiced velar before /r/ was equally likely, Lloyd (p. 237) concludes that one cannot know with certainty the regular outcome of this segment. A possible solution to this problem is that in some instances where /g/ remains before /r/, tautosyllabification has also transpired. This would also improve the syllable contact, though admittedly creating a less preferred head.

In all of the Romance languages we have looked at so far, heterosyllabification of word-internal clusters has been proposed. In most cases I have argued for the tautosyllabificaiton of -Cr- clusters as a syllable contact improvement. But how do we know that /-gr-/, as well as the other clusters with /r/, did not start out as tautosyllabic, undergo weakening in syllable-initial position and then undergo heterosyllabification? A strong reason for arguing for heterosyllabic -Cr- clusters comes from the fact that both -Cl- and -C$\underset{\wedge}{i}$- have also been reconstructed. Convincing evidence for the heterosyllabification of these clusters comes from the sound changes we have discussed in this and previous sections, metathesis, glide strengthening and coda weakening. If we accept that the heterosyllabic cluster C$$\underset{\wedge}{i}$ existed in Proto-Romance, we must assume, given the Synchronic Maxim, that C$r also existed in Proto-Romance because a language will not contain a less preferred structure without also containing a more preferred structure. In other words, if the less preferred structure C$$\underset{\wedge}{i}$ existed in Proto-Romance then the more preferred structure C$r must have also been present.

Several sound changes in Spanish have led us to reconstruct heterosyllabic consonant clusters for Proto-Romance. In the next section we will examine additional historical changes in French which further supports this reconstruction.

## 6. French[63]

In this section I will examine additional evidence from French which corroborates the reconstruction of heterosyllabic clusters in Proto-Romance. We will look at syllable structure changes such as coda weakening, tautosyllabification and metathesis which have been shown to improve syllable structure.

### *6.1 Coda weakening and tautosyllabification*

Recall that in our list of syllable structure motivated sound change, coda weakening is one way to improve a poor syllable contact. When a strong coda is followed by a weaker onset, the coda weakens in order to improve the contact. This is the type of change we see occurring in (56).[64] Before a palatal glide, the stop itself weakens to a glide and is lost.

| (56) | Latin | Gallo-Roman[65] | French | Proto-Romance | |
|---|---|---|---|---|---|
| a. | radium | +[raiə] | rai [ø] | d$i̯ | 'ray' |
| b. | corrigiam | +[kɔrrɛi̯ə] | courroie [ø] | g$i̯ | 'strap' |

The developments of these clusters word-medially after another consonant differs from their intervocalic development.

| (57) | Latin | Gallo-Roman | French | Proto-Romance | |
|---|---|---|---|---|---|
| a. | hordium | +[ɔrdžə] | orge [ž] | C$di̯ | 'barley' |
| b. | Giorgium | +[džɔrdžə] | Georges [ž] | C$gi̯ | 'George' |

In the above examples we see that word-medially after a consonant, the voiced dental and velar stops assimilated to the tautosyllabic glide and became affricates. Intervocalically, these same stops instead reduced to glides and were effaced. These separate developments suggest that these stop-glide sequences were actually in different syllable structures.

The development in (56) can be explained if the stops are taken to be in the coda followed by a weaker syllable head. In this environment the stops weakened in order to improve the syllable contact. If the stops in (56) were in the onset position, we would

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[63]The examples in this section come from Pope (1952) or Jacobs (1991).
[64]These reconstructions are based on Jacobs (1991).
[65]Gallo-Roman is the period from the end of the fifth century A.D. to the middle of the ninth century (Pope 1952:9).

expect the same type of development as we see in (57), but this is not the case. As well, if the stops in (56) were actually in the onset position, we might expect developments similar to those which occurred when these stops appeared intervocalically, as shown in (58).

| (58) | Latin | Gallo-Roman | French | Proto-Romance | |
|---|---|---|---|---|---|
| a. | nūda | +nuða | nu | VdV | 'nude' |
| b. | rūga | +ruɣa | rue | VgV | 'street' |

In (58) the stops weakened to fricatives then deleted. Yet the stops in (56) did not undergo an initial stage of spirantization before deleting (see Pope 1952:124). The weakening in (56) can again be explained as a syllable contact improvement. The less preferred syllable contact becomes more preferred when the stop is weakened to yod and finally lost.

In Gallo-Roman, when a velar plosive and a liquid occurred intervocalically the velar weakened to yod. This consequently palatalized the following lateral liquid.

| (59) | Latin | Old French[66] | | French | Proto-Romance | |
|---|---|---|---|---|---|---|
| a. | oculum | [ueʎ] | ueil | oeil | k$l | 'eye' |
| b. | lacryma | [lairmə] | lairme | larme | k$r | 'tear' |
| c. | regula | [reʎə] | reille | --- | g$l | 'rail, bar' |
| d. | fragrare | [flairier] | flerer | flairer | g$r | 'to smell' |

This weakening can be explained as a syllable contact improvement if we start with a heterosyllabic plosive-liquid cluster. Again, we can compare the developments in (59) to the development of the plosive intervocalically.

| (60) | Latin | Gallo-Roman | French | Proto-Romance | |
|---|---|---|---|---|---|
| a. | bāca | +[baga] > +[baɣa] | baie | VkV | 'berry' |
| b. | nĕgāre | +[nɛɣare] | nier | VgV | 'to deny' |

As we can see, intervocalically the velar plosives first spirantized then were deleted (Pope 1952:137). Intervocalically before a liquid, however, the stops weakened to glides. The divergent developments once again can be accounted for if we assume that we are dealing

[66]Old French is the period from the middle of the ninth century A.D. to the beginning of the fourteenth century (Pope 1952:9).

with two separate syllable structures. In (59) the plosives are in the coda position and in (60) they are syllable-initial.[67]

Among the labial and dental plosives, we do not see such a clear picture of heterosyllabification given that typical syllable contact changes are not present. First, I will examine the development of dentals + /l/ or /r/.

Intervocalically, a dental plosive followed by a liquid in Gallo-Roman weakened to the interdental fricative [ð], with prior voicing if the dental stop was /t/ (Pope:149). This fricative then either assimilated to the following liquid or was effaced.

| (61) | Latin | Old French | | French | Proto-Romance | |
|---|---|---|---|---|---|---|
| a. | +(e)spatula | [espaðlə] > | [espałlə] | épaule | t$l | 'shoulder' |
| b. | vĭtrum | [veiðrə] | veirre | verre | t$r | 'glass' |
| c. | mŏdŭlum | [moðlə] > | [mołlə] | moule | d$l | 'mould, form' |
| d. | hĕdĕra | [ieðrə] > | [ierə] | lierre | d$r | 'ivy' |

Similarly, the dental stops spirantized and were lost intervocalically.

| (62) | Latin | Old French | French | Proto-Romance | |
|---|---|---|---|---|---|
| a. | vĭta | [viðə] | vie | VtV | 'life' |
| b. | nūda | +[nuða] | nu | VdV | 'nude' |

Y-C Morin (p.c.) has pointed out that the dental plosive + /r/ must have been tautosyllabic in order to account for the diphthong in *veirre* which only developed in an open syllable.[68] However, after the plosive weakened to a fricative while in onset position (pre-Old French vĭ$trum, OFre. [vei$ðrə]), the syllable boundary seems to have shifted so that the fricative became the coda of the preceding syllable (OFre. [vei$ðrə] > OFre. [veið$rə]. This would explain the assimilation between the syllable-final fricative and the following liquid shown in the Old French word *veirre* (OFre. [veið$rə] > Fre. *verre*, also with a loss of the diphthong).

While it appears that a dental + /r/ was tautosyllabic in Old French, it is unlikely that the dental stops + /l/ shown in (61) were also tautosyllabic given that this would create

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[67]Dauzat (1950:46) supports the idea of coda weakening with regards to VglV and VgrV in French and also says that the syllable division of Latin *oc(u)lus* was k$l, which explains the glide formation (cf. Meyer-Lübke and Bourciez (1937) who hold the same opinion).

[68]An open syllable must be assumed to account for other vocalic developments, for example, Lt. *fratrem*, Fre. *frère* 'brother' where Late Latin /ã/ became French /ɛ/ (see Nyrop 1914:364-365; Pope 1952:244).

unacceptable syllable heads.[69] Plosive-/l/ clusters likely remained heterosyllabic from Proto-Romance into Old French. Being in a nonpreferred syllable position, the plosive weakened to a fricative before /l/ and then assimilated to the liquid, producing Old French words such as *espalle* and *mole*.

Gallo-Roman sequences consisting of a labial plosive and a liquid did not undergo any radical changes in French. The labial before /r/ first weakened to a bilabial fricative, with prior voicing if the labial was /p/, then became the fricative [v]. The labial plosives remained unchanged before /l/, except for voicing of /p/ (Pope:149). This is shown below.[70]

| (63) | | Latin | Old French | French | Proto-Romance | |
|---|---|---|---|---|---|---|
| | a. | aprilem | [aβril] | avril | p$r | 'April' |
| | b. | dŭplum | [doblə] | double | p$l | 'double' |
| | c. | fēbrem | [fievrə] fievre | fevre | b$r | 'labourer' |
| | d. | flebĭlem | [feiblə] feble | faible[71] | b$l | 'weak' |

The parallel spirantization of the labial and dental plosives before /r/ seems to indicate that the labial + /r/ clusters were also tautosyllabic. The weakening of the plosive before /r/ and not before /l/ can be accounted for if both sets of clusters were tautosyllabic in Old French (Murray 1987:126). According to Murray (1987), we would not predict on the basis of the Syllable Contact Law a differential development between VplV and VprV if these clusters were heterosyllabic; however, their different courses of development can be explained if the clusters were tautosyllabic. Because /r/ has a lower consonantal strength value than /l/, weakening of the syllable-initial plosive before /r/ would be more acceptable than weakening of a syllable-initial plosive before /l/. In other words, $vr is a more acceptable syllable head than $vl. This accounts for the maintenance of the plosive before the lateral liquid in the examples above.

While the sound changes we have seen involving a labial or dental plosive followed by a liquid indicate that these clusters were tautosyllabic in Old French, comparative evidence from the other Romance languages studied allows us to hypothesize that these clusters were once heterosyllabic at an earlier stage. Stronger support for

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[69]The shift of VtlV > VklV in Romance would allow the velar to be in syllable-initial position. However, I argued above that velar plosives before /l/ intervocalically were in the coda position which explains the coda weakening in (59).

[70]The bilabial fricative /β/ also became [v] before a liquid but this is not discussed here.

[71]The Modern French examples in (63c) and (d) also underwent a monophthongization of the Old French diphthongs.

heterosyllabification of these word-internal plosive and liquid clusters comes from the development of the velars in coda position which weakened to yod, as shown in (59). As shown in Table 2, g$r and g$l are the most preferred syllable contacts consisting of a stop + liquid. The fact that both /k/ and /g/ weakened to yod before a liquid in French indicates that these two segments were treated alike, that is, as a class of sounds undergoing a particular improvement. Since the most preferred contacts, velar stop + liquid, underwent improvement, this implies that the less preferred syllable contacts, those consisting of labial stop + liquid or dental stop + liquid, must have already gone an improvement, according to the Diachronic Maxim. While the velar plosives weakened to yod in syllable-final position to improve the syllable contact, it appears that for the dental and labial plosives followed by liquids, tautosyllabification was an alternate solution to improving the syllable contact.

### *6.2 Metathesis*

The final piece of evidence from French which supports the claim that intervocalic consonant clusters were originally heterosyllabic comes from metathesis of consonants before yod.

| (64) | Latin | Old French | | French | Proto-Romance | | |
|---|---|---|---|---|---|---|---|
| a. | ariam | [aiɾə] | (1) | aire | r$i̯ | (-1) | 'area' |
| b. | basiare | [baiz̯ier] | (3) | baiser | s$i̯ | (-4) | 'kiss' |

Metathesis improved the syllable contacts as we can see by comparing the syllable contact evaluations of Proto-Romance with those of Old French.

Recall that when we discussed metathesis in Catalan and Portuguese, we raised the question of whether the creation of the diphthong in such examples could have resulted from regressive palatalization. We concluded that it was unlikely that the fricative before yod could have remained unaltered if it was indeed palatalized. The same can be said with regards to French *baiser*. Metathesis is the more probable origin of the diphthong.

This final set of examples shows us that metathesis in French implies VC$CV in Proto-Romance.

## 7. Summary

In this chapter I have tried to demonstrate using various sound changes in the Romance languages, that intervocalic consonant clusters in Proto-Romance should be

syllabified as VC$CV. In the following section I present an independent argument for the reconstruction of heterosyllabic consonant + yod sequences in Vulgar Latin from Pensado (1989).

### *7.1 Unnatural syllabifications*

Pensado (1989:123) also reconstructs heterosyllabic consonant + glide sequences for the "Common" Romance stage based on several sound changes in Romance, such as metathesis, glide strengthening and gemination and from metrical evidence in Classical Latin. However, she argues that this "unnatural" heterosyllabic sequence arose from an earlier tautosyllabic sequence, i.e., Classical Latin V$C̲iV > Vulgar Latin VC$i̲V through resyllabification (p. 118). In Classical Latin, heterosyllabic sequences of consonant + glide were eliminated by the creation of hiatus, that is, the glide became syllabic. These sequences then became tautosyllabic in Vulgar Latin when the hiatus was destroyed after the glides lost their syllabicity. The tautosyllabic sequences became heterosyllabic once again in Vulgar Latin and were subsequently eliminated through syllable contact improvements (p. 124). Pensado claims then, that CL C$i̲ > VL $Ci > VL $C̲i > VL C$i̲.

According to Pensado (p. 125), the pre-existence of consonant + glide sequences in Classical Latin influenced syllabification of consonant + glide sequences in Vulgar Latin. With evidence from metrics, Pensado (p. 125) shows that Classical Latin consonant + glide sequences were heterosyllabic across word or prefix boundaries. These "unnatural" morphologically conditioned syllabifications spread to word-internal consonant + glide sequences in Vulgar Latin causing "natural" tautosyllabic consonant + glide sequences to resyllabify and become "unnatural" heterosyllabic sequences (p. 134).

While I agree with Pensado that Proto-Romance consonant + glide clusters were heterosyllabic, I do not believe they started out as tautosyllabic and then resyllabified. Her analysis presupposes that Vulgar Latin derived linearly from Classical Latin. She herself acknowledges that Pre-Latin had heterosyllabic consonant + glide sequences which were passed on to Classical Latin (p. 133). I would argue that Pre-Latin heterosyllabic clusters were passed on directly to Proto-Romance and not through Classical Latin. The resyllabification of V$CGV > VC$GV Pensado argues for in Vulgar Latin is phonologically unmotivated, and as she says, creates "unnatural" syllable structures. However, the shift from Pre-Latin VC$GV to Classical Latin V$CGV can be "naturally" motivated as a syllable contact improvement. If Vulgar Latin did not derive linearly from Classical Latin, then the assumption of morphological analogy that gave rise to the Vulgar

Latin heterosyllabic clusters is not required. If Vulgar Latin[72] instead derives directly from Pre-Latin, with Classical Latin being a sister dialect, then the maintenance of heterosyllabic clusters is accounted for, as is the tautosyllabification of the consonant + glide, as well as consonant + liquid clusters in Classical Latin. In chapter five I discuss further the relationship between Classical Latin and Proto-Romance.

In the next chapter we will look at two recent theories from Clements (1990) and Rice (1992) that examine the syllabification of consonant clusters in order to see how their models might account for the sounds changes we have explored in the Romance languages.

[72]Recall that in the introduction to this thesis the argument was made against using the term Vulgar Latin since its meaning is so varied. Instead, I opted to use the term Proto-Romance to refer to the direct descendant of Pre-Latin and the sister dialect of Classical Latin.

# Chapter Three

# SONORITY AND SYLLABIFICATION

## 0. Introduction

There are a number of other syllabification theories which refer to the "strength" of a segment in determining syllable structure. In contrast to the Preference Law theory, the two theories I discuss below determine the syllabification of segmental sequences by the sonority of the individual segments involved rather than consonantal strength. The purpose of presenting these alternate syllabification theories is to see how they compare with the Preference theory in accounting for syllable structure and syllable structure changes. The first one I will look at is Clements (1990) and the second is Rice (1992).

## 1. Clements (1990)

### *1.1 Sonority scale*

In Clements (1990), sonority is a derived phonological property expressed in terms of the binary features syllabic, vocoid, approximant and sonorant. Each of the five major class features, obstruent, nasal, liquid, glide and vowel, are specified as being plus or minus these binary features. The more "plus-specifications" a segment has, the more sonorous it is. For example, a glide has the features [-syllabic], [+vocoid], [+approximant][73] and [+sonorant]; therefore, a glide would be ranked higher in sonority than a class of sounds which had fewer plus-specifications, such as liquids, nasals and obstruents (p. 292) (see section 2.2.1, chapter one for further discussion of these class features). The ranking of these five major classes is shown in the sonority scale below.

(1) Sonority Scale (Clements 1990:294, from Rice 1992:65)

| least sonorant | obstruent < nasal < liquid < glide < vowel | most sonorant |
|---|---|---|

Comparing the Sonority Scale from Clements with the Consonantal Strength Scale from Murray and Vennemann (1983) mentioned in chapter one, we see that the glides, liquids and nasals are in the same strength relation to one another. As mentioned in chapter

[73]Clements (p. 293) defines approximant as 'any sound produced with an oral tract stricture open enough so that airflow through it is turbulent only if it is voiceless'.

one, Clements does not articulate his class of obstruent segments as M & V do. Both stops and fricatives are included in the class of obstruents. For M & V, the distinction between these two classes falls out from historical sound changes. For instance, we often see the historical development of /t/ > /d/ > /ð/ in language, as in Lt. *vita*, Sp. *vida* [viða] (< OSp. [vida]. This progression reflects the idea that voiceless stops weaken to voiced stops which in turn weaken to fricatives.

Clements also makes no voicing distinction on the sonority scale. Yet as the Spanish example above shows, voiceless segments are normally stronger than voiced ones, which accounts for the shift from a voiced to voiceless segment. Without making these refinements, Clements' model does not account for certain changes witnessed in Romance.

### *1.2 The demisyllable*

While M & V examine the syllabification of consonant clusters (as does Rice 1992, discussed below) Clements' syllabification rules hold over the demisyllable. A syllable is divided into two overlapping parts and each part is a demisyllable. For example, the syllable [kran] is divided into the demisyllables [kra, an] with the nucleus appearing in both demisyllables (p. 303). Clements uses "dispersion of sonority" and "complexity" of the demisyllable to determine syllabification and a hierarchy of syllable types (p. 304-305). For instance, a three member initial demisyllable consisting of OLV (obstruent-liquid-vowel) shows the lowest dispersion of sonority, with a sharp rise in sonority at the beginning of the demisyllable, thus it is given a complexity ranking of 1. A three member initial cluster consisting of LGV (liquid-glide-vowel) on the other hand has a high dispersion of sonority since there is only a moderate rise in sonority at the beginning of the demisyllable; therefore, it is given a complexity ranking of 4 (see Clements 1990:305, Table 1). According to the Dispersion Principle (p. 304), the lower the sonority dispersion of the initial demisyllable, the more preferred that demisyllable is. Alternately, the higher the dispersion of sonority in the final demisyllable, the more preferred that demisyllable is. In the example given above, the initial demisyllable of OLV is preferred to LGV.

As we can see, the observation made by Clements parallels the prediction of Head Law (c) of the Preference theory, which states that the first member of an initial syllable cluster should be as consonantally strong as possible followed by a weaker offset in order to maximize the slope of the syllable head. In other words, an initial cluster of $pl is more preferred than $l̪i because the slope is steeper in the plosive-liquid cluster. Clements (p. 305, Table 17.1) also shows that the highest ranked three member final demisyllable is one

consisting of VLO, which is likewise predicted by Coda Law (c). A final consonant cluster should have the strongest member in the offset position with any preceding consonants being lower in consonantal strength so that the slope of the coda is maximized toward the preceding nucleus.

### *1.3 Core syllabification principle*

The Core Syllabification Principle (p. 317) adjoins consonants to the left or right of a syllable nucleus on the basis of their sonority rank in comparison to the syllable nucleus, the first segment to be associated to the syllable node. Segments are iteratively adjoined to the left of the nucleus as long as they are less sonorous than the nucleus (p. 300). In this way, the Maximal Onset Principle is derived by the CSP. Given the sequence VOLV (e.g., VplV), the CSP would divide the segments into the demisyllables V-OLV (V$plV) rather than VO-LV (Vp$lV) or VOL-V (Vpl$V). The syllable division is based on the complexity and sonority dispersion of the demisyllables involved. The final demisyllable V is less complex than VO because there is no decline in sonority (p. 306). Because of the cross-linguistic preference for open syllables, V-OLV is considered a simpler sequence than VO-LV (p. 316). As mentioned in the first chapter, the Maximal Onset Principle can also be derived from the Preference Laws. The Syllable Contact Law predicts that in a sequence of VplV, the preferred syllabification is V$plV, rather than Vp$lV.

### *1.4 Syllable contact law*

Clements (p. 319-320) argues that Vennemann's (1988) Syllable Contact Law can be derived from the principles of his theory without having to be stipulated separately. In the example above, the sequence VOLV is syllabified as V-OLV by Clements on the basis of the complexity of the demisyllables. In the Syllable Contact Law, this syllabification would be the same based on the fact that a syllable contact consisting of a strong coda followed by a weaker onset is not preferred. However, under Clements' analysis, syllabification is determined by intrasyllabic features and intersyllabic dynamics are not considered (except when language-specific syllable structure preferences come into play which we will discuss shortly). However, Clements determines the preference of a syllable contact on the basis of an aggregate complexity score, which is the sum of the complexity values of the demisyllables in contact (p. 319). In terms of the Preference Laws, we said that gemination in Italian improved a poor syllable contact consisting of a

strong coda followed by a weaker onset. To improve the contact a new consonant was created in the onset position which was identical to the original consonant in the coda position, for example, VC$i̯V > VC$Ci̯V. The SCL states that the higher the contact evaluation, the more preferred the contact. A contact of Vp$i̯V would have an evaluation of -8 while a contact of Vp$pi̯V is 0. Therefore, the geminate construction is more preferred. Using Clements' complexity values, the sum of VO-GV is 8 while the sum of VO-OGV is 5. Since the optimal contact type is one which has the lowest aggregate complexity, VO-OGV is also preferrable to VO-GV.

We can see that the ranking of segments according to consonantal strength provides the same syllable contact preference as Clements' sonority model. Assigning a strength value to the segments on the Consonantal Strength scale appears to be no more stipulative than assigning sonority values to the segments on Clements' scale. With regards to the division of consonant clusters, Clements' model appears to make the same predictions as the Preference laws, showing that both are valid methods of determining syllabification.

### *1.5 Sequential markedness principle*

The reader will notice that Clements' Sonority scale does not include place of articulation. It has been observed (Greenberg 1978:268) that if VCC demisyllables occur in final position, one of these demisyllables will take the shape VCT, where T stands for a dental or alveolar consonant. The inverse is true for initial CCV demisyllables. One of the demisyllables will consist of TCV. Clements (p. 312-314) argues against including place features, such as coronal, on a sonority scale since the sonority of coronals can fluctuate. That is, even within a single language a coronal may have a high sonority or a low sonority depending on its position in the syllable and its relation to other segments in the syllable. Instead, Clements (p. 313) opts for introducing a principle based on the universal markedness of segments to determine their likely position in a demisyllable. This principle is the Sequential Markedness Principle and predicts that a sequence of *pt* is more likely to occur than *pk* since *t* is simpler than *k* because anterior coronals are formed at the least marked place of articulation (p. 313; cf. Stevens and Keyser 1987). However, as Rice (1992) points out, Clements can account for the appearance of a coronal in a consonant cluster, but he does not explain the position of the coronal segment in these clusters.

Place of articulation is also not included in M & V's Consonantal Strength scale. It would seem that the Preference Laws as stated cannot account for the appearance of coronals in these types of clusters. Head Law (c) predicts that a preferred complex syllable

head should contain /p/ as the initial member since /p/ is the strongest segment on the strength scale. However, the appearance of coronals as the first member of an initial cluster or as the last member of a final cluster is a sequential preference which is not predictable on the basis of sonority or consonantal strength (Murray 1992:126). The Preference Laws as such are not meant to capture sequential preferences but the syllable structure preferences which are based on consonantal strength (Murray 1992:129). Since the Preference theory is a markedness theory, we could easily incorporate Clements' Sequential Markedness Principle into our own in order to account for these coronal clusters. We could tentatively reword Clements' principle using more familiar Preference Law terminology:

(2) Sequential Preference Principle (based on Clements 1990:313)
For any two segments A and B and any given context X__Y, if A is less marked than B, then XAY is more preferred than XBY.

As I have stated above, with Clements' original Sequential Markedness Principle, *pt* is simpler than *pk*. Using the Sequential Preference Principle we could say that the cluster *pt* is preferred to *pk* because it contains the less marked consonant *t*.

### *1.6 Minimal sonority constraints*

I previously mentioned that in Clements' theory, language-specific preferences can override the Core Syllabification Principle to create less than optimal syllable structures. These syllabification rules are considered to be surface exceptions which occur after the initial syllabification level (Clements:310). As well, there are seemingly ideal syllable structures created by the CSP which are unacceptable in certain languages. In these languages adjacent segments within the same syllable should not be too similar in sonority rank (p. 317). That is, there is a minimal sonority constraint for segments coocurring in the same syllable.

Clements (p. 318) states that in universal grammar, the default setting for the maximal complexity of a demisyllable is 1. Therefore, only three member initial demisyllables of the type OLV are allowed. Using Clements' sonority scale, O < N < L < G < V, this maximal complexity translates into a minimal sonority distance of 2. As we can see on the scale, the distance between the obstruents and the liquids is two places. In order to allow for different types of initial demisyllables, such as ONV in which the minimal sonority distance is 1, the language learner must hear these types of demisyllables

being spoken in the language. That is, the default setting is only abandoned when evidence to the contrary is encountered (p. 318). In Spanish, the minimal sonority distance for adjacent consonants is 2, therefore, in Spanish the initial demisyllables consisting of either ONV or NLV are prohibited since there is only a sonority distance of 1 (p. 317). These minimal sonority constraints tend to be observed only in initial demisyllables and not final demisyllables according to Clements (p. 318).

The Preference Laws do not allow or disallow particular syllable structures, such as an initial cluster of ON or NL. Instead, the Head Law predicts that universally these types of initial clusters are not preferred, but if they do occur there is a likelihood of improvement. This allows for the appearance of initial clusters such as $kn in Germanic and also explains the shift from Old English $kn to Modern English $n (from less preferred to more preferred). The Preference Laws are not constructed in such a way as to prohibit syllable structures but to reflect cross-linguistic generalizations.

### *1.7 Summary*

In this overview of Clements (1990) we have seen that the syllabifications based on the principles outlined in his sonority theory make predictions similar, if not identical, to those of the Preference Law theory. Although both Clements' syllabification theory and the Preference Law theory predict similar outcomes, Clements is not explicit about how syllable structure will be improved. Vennemann (1988) on the other hand, elucidates a number of possible sound changes that can be implemented to improve syllable structure. The catalogue of sound changes which Vennemann provides has proven useful in the reconstruction of Proto-Romance syllable structure as we saw in the last chapter. We have also seen that in the syllabification of Proto-Romance consonant clusters we have had to refer to the strength differences between stops and fricatives, which is not possible using Clements' sonority scale. For these reasons, it is appropriate to refer to the Preference Laws in accounting for certain sound changes in the Romance languages.

In the next section we will look at another account of syllabification of consonant clusters which also refers to the sonority of segments.

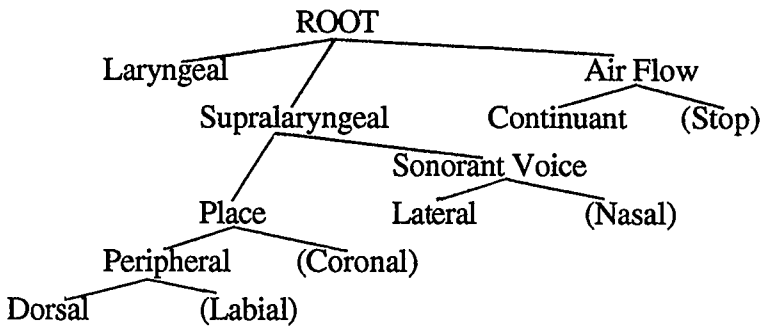
## 2. Rice (1992)

In Rice (1992), consonant cluster syllabification is structurally determined by sonority and place of articulation constraints. An entire discussion of this theory is beyond

the scope of this paper. I will briefly mention the main principles and conclusions presented by Rice.

As in Clements (1985) and others, in this framework segments are believed to have a hierarchical structure and are not simply bundles of unorganized features (Rice and Avery 1990:428). Within Rice's (1992) theory (largely based on Clements 1990), a representation of segment structure contains the constituency nodes Place, Sonorant Voice (SV), Supralaryngeal (SL), Air Flow (AF) and Laryngeal (p. 62). These constituent nodes dominate the feature nodes of a segment, for example, SV dominates Lateral and Nasal. Each of the constituent nodes dominates an unmarked content feature which is unspecified in the underlying representation. Stop is unmarked for AF, Nasal for SV, Coronal for Place and Labial for Peripheral (p. 63). The unmarked feature of a node is inserted into the representation by a default rule at the phonetic interpretation level (p. 63). A representation of segment structure is shown below (from Rice 1992:62). The unmarked feature of each node is shown in parentheses.

(3)

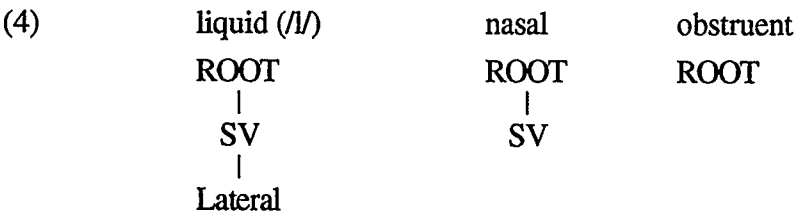



On the basis of this segmental structure Rice can describe the sonority of liquids, sonorants and stops.

## *2.1 Sonority*

In this model, sonority is determined by how much SV structure a segment has. The more SV structure a segment has, the more sonorous it is (p. 66). This is illustrated below (from Rice:65).

(4)




The obstruent has the least amount of SV structure, therefore, it is less sonorant than either the nasal or the liquid. The nasal is less sonorant than the liquid.

Vennemann (1988:8) describes consonantal strength as the 'degree of deviation from unimpeded (voiced) air flow'. This means that voiceless stops are consonantally stronger than any other consonant. This definition employs two phonetic features: voicing and degree of constriction. In Rice's model, sonority is based on the amount of Sonorant Voice structure a segment has (previously referred to as Spontaneous Voice in Rice and Avery 1991). Piggott (1992:48) defines Spontaneous Voice in the following manner: 'A vocal tract configuration in which the vocal cords vibrate in response to the passage of air'. The SV node dominates [nasal] and [lateral] but excludes voiceless stops, fricatives and laryngeal glides (Piggott:48). How sonorant a segment is is based on the amount of SV structure a segment has. Sonorance itself is based on 'air pressure, rate of air flow and tension of the vocal cords' (Piggott:48). Although this definition is similar to that of consonantal strength, which defines all segments, the SV node is meant to define [nasal] and [lateral]. The existence of an SV node is argued for on the basis that sonorants tend to pattern together with regards to certain phonological processes such as assimilation and desonorantization (Rice and Avery 1991:107).

Let's examine how syllabification of consonant clusters works in Rice's framework. First, Rice (1992:66) states that for a consonant cluster to be tautosyllabic, the onset must be less sonorant than the offset. That is, 'the first consonant must have less SV structure than the second' (p. 66). In $AB, A should be less sonorant than B. We can see that this claim is similar to the one shown in Head Law (c), which states that the strength of the onset should be stronger than any following segments in the head.

With regards to heterosyllabic clusters, Rice (p. 67) posits that in order for a consonant to be syllabified into coda position, the consonant must be at least as sonorant as the following onset. In other words, the coda must have more SV structure than the following onset. In Preference theory terminology, this translates to mean that a consonant in coda position should be either as consonantally strong as or weaker than the following

onset. This generalization falls out directly from the Syllable Contact Law which Rice herself refers to.

### 2.2 *Minimal sonority distance*

Within a language there may also be contraints on the minimal sonority distance between two segments in a syllable head (p. 67). We have already seen how this works in Spanish (see section 1.6 of this chapter). For instance, in English a syllable head consisting of a stop-nasal cluster is prohibited even though the onset would have less SV structure than the offset. The reason for this is because in English, 2 is the minimal sonority distance between two consonants in an onset (Clements 1990:317-318).[74] The sonority distance is based on Clements' (1990) Sonority scale presented in the previous section. Since the sonority distance between obstruents and nasals is only 1 on Clements' scale, both segments cannot cooccur in a tautosyllabic cluster.

As stated in the previous section, the Preference Laws do not disallow a tautosyllabic cluster of stop-nasal. This is because the laws reflect attested syllable structures found in various domains of language. The Head Law represents the fact that a syllable head consisting of a stop-nasal sequence is nonpreferred and may undergo an improvement. This may in fact be more desirable than the restrictive minimal sonority distance requirement since the Head Law would allow for languages such as Greek and German to have syllable-initial stop-nasal sequences without having to stipulate language-specific minimal sonority distances. Yet the Preference Laws may be too unconstrained by virtue of the fact that they do not disallow certain syllable structures but only state that certain structures are not preferred. The Preference laws that we have referred to do not predict that an initial cluster of $tlV will not exist in a language.[75] The Head Law states

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[74]Presumably in Old English, which had stop-nasals as onsets, e.g., $kn-, the minimal sonority distance was only 1, otherwise there would be no way to account for this tautosyllabic cluster. Evidently, the minimal sonority distance can change over time, perhaps as a fall out from a 'repair strategy' (see section 2.5, this chapter), such as the type Rice refers to, e.g., complex head simplification. As we saw in the discussion on minimal sonority constraints in section 1.6 of this chapter, Clements (1990:318) argues that with regards to the maximal complexity of an initial demisyllable, the universal default setting is 1, which equals a minimal sonority distance of 2 for three member initial demisyllables. This default setting is only changed in the face of evidence to the contrary. Therefore, children acquiring Old English would shift the maximal complexity setting from 1 to 2 on the basis of evidence in the spoken language. This would allow for the initial demisyllables consisting of stops + nasal. After Old English #kn- became Modern English #n-, children acquiring the language would not have to shift the default setting since the stop-nasal clusters no longer existed.

[75]Murray (1992:126) has presented the Law of Laterals to account for the fact that dental-lateral clusters tend to occur heterosyllabically.

that if this head does occur, it will likely undergo some type of improvement. But as I have just stated, perhaps the flexibility inherent in the Preference Laws is required in order not to rule out clusters which actually occur in natural languages.

There are two overriding exceptions to Rice's sonority based syllabification rule. The first we have already seen. It is the minimal sonority distance constraint which stipulates the sonority distance required between two tautosyllabic consonants. In English, the word *signify* is syllabified as *sig$nify* even though /g/ is less sonorant than the following segment and therefore should be syllabified into the onset position, that is, si$gni$fy. Because the minimal sonority distance in English is 2, the stop-nasal cluster is disallowed in head position. The second exception refers to place of articulation. In Rice's theory, two consonants which share the same place structure are not allowed to be together in onset position (p. 76). Like SV structure, segments also have a certain amount of Place structure. The different Place structures of various segments are given below (from Rice:75).

(5)

| labial | coronal | dorsal | glottal stop |
|---|---|---|---|
| ROOT | ROOT | ROOT | ROOT |
| \| | \| | \| | |
| Place | Place | Place | |
| \| | | \| | |
| Labial | | Dorsal | |

The figures above show that labials and dorsals have the same amount of Place structure. Coronals have less Place structure than the labials and dorsals and the glottal stop has no Place structure at all. The motivation for this constraint on shared Place structure comes from linguistic data which do not follow the rules of syllabification based solely on sonority. For example, in English the liquid-obstruent cluster in the word *alter* would be syllabified as al$ter based on the sonority of the two segments in contact. The liquid is more sonorant, therefore it is correctly syllabified into coda position. As just mentioned above, *sig$nify* is syllabified as such since the minimal sonority distance constraint in English is 2, which requires the /g/ to be syllabified into coda position.

In the English word *atlas* however, there is no reason not to syllabify the word as a$tlas based on sonority alone or minimal sonority distance. The coronal stop should be

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Law of Laterals
A cluster consisting of an alveolar or dental + lateral is disfavoured.

This could be added to our list of Preference Laws in order to account for this sequential preference.

allowed to be tautosyllabic with the liquid since it is less sonorant than the following liquid and the minimal sonority distance of 2 is satisfied. Yet as we know, this word is syllabified as at$las. In order to explain this, Rice argues that two consonants in head position may not share the same amount of Place structure. Since the stop /t/ and the liquid /l/ are both coronal, they share the same Place structure, therefore they must be in separate syllables.[76]

### 2.3 *Sequential markedness principle revisited*

In languages like French and Greek, the heterosyllabic obstruent-obstruent clusters such as /pt, kt/ are found but not the reverse, that is, */tp, tk/ (Rice:82). Notice that it is a coronal that is the second element in the acceptable clusters. As well, clusters like /pk, gp/ are rare. We saw that Clements (1990) has tried to account for the presence of a coronal in these clusters with the Sequential Markedness Principle which states 'that /pt/ is simpler than /pk/ because /t/ is simpler than /k/ in terms of markedness' (Rice:82). As Rice points out, this principle does not account for the order of the obstruents. Instead, Rice (p. 82) argues that the order of the obstruents can be accounted for in terms of Place structure and government.[77] Because coronals have less Place structure than other obstruents in these obstruent-obstruent clusters, they can act as governors of the preceding consonant (p. 82). Rice (p. 83) states that '[c]oronal obstruents are second in obstruent-obstruent clusters as they can govern the preceding consonant. Since the coronal obstruent is not governable, it cannot occur as the initial member of an obstruent-obstruent sequence'. What this shows is that intersyllabically, a consonant can occur in coda position as long as it is governed either by a segment with less place or less sonority (p. 83).

### 2.4 *Continuancy*

Recall that in Clements (1990) there was no differentiation between stops and fricatives. All obstruents were grouped together. M & V on the other hand do separate

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[76]The place constraint that Rice proposes appears to be that captured by the Obligatory Contour Principle (OCP) (Leben 1973, Goldsmith 1976, McCarthy 1986), which states 'Adjacent identical autosegments on an autosegmental tier are prohibited' (Mester 1988:127). If in Rice's (1992) segmental representation place features occur on the same tier, then the OCP would prohibit adjacent segments that share identical place features.

[77]Government: 'A governs B if B has more relevant structure than A' (Rice 1992:83). A may govern B in terms of sonority or in terms of place structure. That is, if A is less sonorant than B, then A may govern B in terms of sonority (either tautosyllabically or heterosyllabically). If A has less place structure than B, then A may govern B in terms of place structure.

these two types of segments on the Consonantal Strength scale. Rice (p. 88-89) argues that continuancy does not define sonority. That is, whether a segment is a continuant or a stop is not a universal factor in determining syllabification. For instance, in Modern Greek a consonant in onset position must be less continuant than the consonant in coda position, e.g., *hepta* > *hefta* 'seven' (Rice:88, from Kaisse 1988). In Korean however, the consonant in coda position becomes less continuant. For example, *os-kwa* [oč'k'wa] 'clothes and' (Rice:89). If there was a government relation between the onset and preceding coda based on sonority this type of change would not be expected. Based on the inconsistent treatment of continuants in different languages, Rice agrees with Clements in not including the feature of continuancy on the sonority hierarchy.

I have argued previously, however, that for the reconstruction of Proto-Romance syllable structure it is necessary to differentiate between stops and fricatives in order to account for certain weakening processes. If we simply classify stops and fricatives as obstruents, then we are at a loss to explain the historical development of T > F (where T represents stops and F represents fricatives).

### *2.5 Repair strategies*

What happens when the conditions of syllabification are not met? There are a number of phonological processes which can occur to enhance the phonotactic patterns of a language. Rice (p. 70) refers to these phonological processes as 'repair strategies'. These 'repair strategies' include epenthesis, assimilation, metathesis and coda deletion to name a few. As the reader may notice, some of these repair strategies overlap with the Syllable Structure Motivated Sound Changes presented by Vennemann (1988). Within a Feature Geometry framework, processes such as assimilation and metathesis involve the spreading of features of a segment from one node to another or the delinking of a node from a particular feature. For example, Rice (p. 73) states that 'metathesis' in Sidamo is a means of repairing a heterosyllabic cluster in which the segment in the coda position cannot be governed by the following onset since the onset has more SV structure than the preceding segment. In Sidamo, a stop-nasal sequence becomes a nasal-stop sequence: *gud-nónni* > *gun$dónni* 'they finished' (Rice:73). Rice claims that metathesis is not really the process which is occurring but rather there is a relocation of SV structure from the onset to the preceding consonant. This allows for the consonant to be heterosyllabified by way of SV (sonority) government (p. 73).

In our survey of sound changes in the Romance languages we have also come across metathesis as a means of improving a poor syllable contact. Often in Romance metathesis has taken place between a strong coda and a weaker onset, usually a glide, for example, Lt. *bāsĭum*, Pg. *beijo* 'kiss'. In Rice's representation of segmental structure, however, she does not include vowels, glides or /r/. For this reason there is no way in which to account for the metathesis seen in this example and others like it. Without a structural description of a glide, we cannot explain the syllable contact improvement with Rice's syllabification rules.

We have also seen that within a complex syllable head the second segment of the head may weaken in order to increase the slope from the onset to the following nucleus. We saw this type of slope steepening in Italian, for example, Lt. *plānum*, It. *piano* 'floor'. While Rice's theory predicts that the second element of a complex head will have more SV structure than the onset, that is, the onset will be less sonorous than the offset (p. 69), as in $pl, the theory does not predict that the offset of the syllable head may weaken further to maximize the slope of the head; that is, it does not predict $pl > $pi̯. This type of change, however, is predicted by Head Law (c). We might argue that there was a shift in the minimal sonority distance between Proto-Romance and Italian which would account for $OL becoming $OG. That is, the minimal sonority distance may have been 2 in Proto-Romance, which would then allow $OL, and then increased to 3 to allow only OG to occur syllable-initially. However, this cannot be the case given the presence of Italian words like *sopra* 'above' and *pietra* 'stone' which contain OL clusters syllable-initially.

Rice (1992) does not include the liquid /r/ in her structural representation, though one could likely modify the feature tree in such a way as to account for this liquid. The current representation, however, does not allow for an explanation of the differential developments of /r/ and /l/ we have witnessed in the Romance languages. Rice (p. 76) does tentatively suggest that /r/ may not have a Place node in English, which may account for the presence of tautosyllabic coronal-/r/ clusters and the lack of tautosyllabic coronal-/l/ clusters. However, this is a language-specific claim. Therefore, Rice's theory as it stands cannot make predictions on the different developments of the liquids in the Romance languages.

### *2.6 Summary*

Once again we have seen that a syllabification theory based on sonority makes similar claims to those of the Preference Law theory. While Rice's theory, in which

syllabification is structurally determined, may have advantages over Clements' work, which determines sonority by counting plus-specifications for binary features, it too fails to adequately capture the sound changes we have seen in the development of the Romance languages. For this we need a framework that has a strength scale articulated in such a way as to account for the divergent developments of different consonants and has the predictive ability to explain why certain phonological changes will occur. Vennemann's Preference Laws have proven able to perform these tasks.

# Chapter Four

# PALATALIZATION AS AN INDICATOR OF SYLLABLE STRUCTURE IN EARLY ROMANCE

## 0. Introduction

In this chapter I will attempt to show that a number of sound changes in Romance that have often been labelled "palatalizations" are more aptly characterized as syllable structure improvements. I claim that the reason these syllable structure changes have been called "palatalizations" is that both types of changes have similar outcomes. That is, a palatal segment is a common result of both syllable structure change and palatalization.

The first part of this chapter contains examples from French which demonstrate the difference between palatalization and syllable structure change. Then I present an argument for considering divergent palatalization effects in Italian as syllable contact improvements. These changes are argued to be motivated by the need to improve the nonpreferred heterosyllabification of consonant clusters in Proto-Romance, contrary to a previous analysis presented by Salverda de Grave (1930). The section that follows investigates palatalization in Romanian. We will see that the palatalized reflexes of dental stop + yod sequences in this language indicate that this cluster was at one time heterosyllabic. In the final part of this chapter I will discuss how two groups of researchers have analyzed "palatalization" within a Feature Geometry framework.

## 1. French[78]

Palatalization is an assimilatory process in which nonpalatal segments become articulated in the palatal region, usually in the environment of a front vowel or glide. This process was very prevalent in Early French, affecting nearly all types of consonants. Because palatalization was so common, some linguists (Pope 1952) have grouped all types of palatalizations under one label. However, we will see that some sound changes that have been labelled as "palatalizations", such as glide strengthening, are actually a result of syllable structure improvement, not assimilation. Presented below are phonological

[78]The examples used in this section, including the reconstructions, are from Pope (1952) or Jacobs (1991) unless otherwise noted.

developments in Late Latin and Gallo-Roman that resulted from palatalization which differ from syllable structure improvements that we find in Early French.

### *1.1 First velar palatalization*[79]

During the fourth century A.D., a syllable-initial voiceless velar in Late Latin palatalized and affricated before the front vowels /i/ and /e/, for example, /k/ > [k̲i̲] > [ts] (Jacobs 1991:33, from Pope 1952:124-129). Word-initially, the voiced velar also underwent palatalization and affrication, that is, /g/ > [g̲i̲] > [dž].[80] Word-internally, /g/ followed by a front vowel only affricated after a consonant, as shown in (1f). Intervocalically, /g/ weakened to a glide when preceding a front vowel and was subsequently lost (Jacobs:33). Samples of the First Velar Palatalization (FVP) are shown below (examples from Jacobs:34).

| (1) | Latin | Gallo-Roman | French | |
|---|---|---|---|---|
| a. | centum | [tsent] | cent | 'hundred' |
| b. | placere | [platserɛ̀] | plaizir[81] | 'to please' |
| c. | mercēdem | [mɛrtsiθ] | merci | 'thank you' |
| d. | gentem | [dž̆ent] | gens | 'people' |
| e. | flagellum | [flaie̯llɛ][82] | flaiel[83] | 'whip' |
| f. | argentum | [ardž̆ẽnt] | argent | 'money' |

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[79]Chronologically, the first stage of palatalization started with the dentals and velars before yod. This was followed by the palatalization of velars before front vowels (First Velar Palatalization), and then the palatalization of velars before fronted [a] (Second Velar Palatalization) (Carton 1974:156; based on Straka 1956).

[80]Pope (1952:125-126) states that the reason we have two different developments between /k/ and /g/ is because the voiced palato-alveolar stop which develops from /g/ is articulated further back in the mouth than the voiceless one. Pope also says that an intermediate stage of palatalized [ts$^{j}$] preceded the development of [ts], and this explains the development of the preceding yod, as in French *plaizir*, Latin *placere*. That is, regressive palatalization is believed to be the source of the yod in the diphthong (Morin, p.c., has suggested a similar development). It is possible that when a full front vowel followed the stop the preceding diphthong may have arisen through regressive palatalization. However, in section 4.1 of chapter two I argued that when a yod followed a plosive, as in Catalan *bes* (< +*ba̯is*, Lt. *bāsĭum* ), the resultant diphthong was due to metathesis of the yod, a syllable contact improvement. If the diphthong in this example actually resulted from regressive palatalization, then we might expect some type of palatalizing effect to show up on the "palatalized" fricative /s/, but this is not the case. It appears then, that in some instances a diphthong may be the result of regressive palatalization, and at other times it is the result of a syllable structure improvement, such as metathesis.

[81]Also with intervocalic voicing.

[82]Intervocalically, the palatal reflex of /g/ was normally effaced, e.g., Lt. *regina*, GR [re̯i̯ina] > OFre. [reinə] 'queen' (Pope 1952:127). Between countertonic /a/ and tonic /e/, as in (1e), the yod usually remained (Pope:127).

[83]Old French.

## *1.2 Second velar palatalization*

A later stage of palatalization, referred to as the Second Velar Palatalization (SVP) (Jacobs 1991), was restricted to Gallo-Roman. After original /a/ was fronted in Late Latin,[84] the velar plosives became palatalized and affricated before this vowel word-initially, and word-medially after a consonant (Jacobs:33, based on Pope:127). In Modern French, the affricated reflex of /k/ became /š/ and the affricated reflex of /g/ became /ž/. Intervocalically, neither velar underwent palatalization before /a/, but instead first weakened to a fricative then further weakened to yod (Jacobs:34; Pope:128). This yod either merged with a preceding /i/ or formed a diphthong with the preceding vowel (Pope:128). Word-initial and postconsonantal developments are given in (2) and intervocalic results are shown in (3) (Jacobs:34).

| (2) | | Latin | Gallo-Roman | French | |
|---|---|---|---|---|---|
| | a. | cantare | [tšanter] | chanter | 'to sing' |
| | b. | arcam | [artšə] | arche | 'arch' |
| | c. | buccam | [buttšə] | bouche | 'mouth' |
| | d. | +gambam | [džambə] | jambe | 'leg' |
| | e. | larga | [lardžə] | large | 'wide' |

| (3) | | Latin | Gallo-Roman | French | |
|---|---|---|---|---|---|
| | a. | micam | [miɣa][85] > [mii̯ə] | mie | 'crumb' |
| | b. | negare | [neɣarɛ] > [nei̯erə] | nier | 'to deny' |

The SVP must have occurred after the intervocalic stops in (3) underwent voicing and spirantization since intervocalic velar stops did not undergo palatalization and affrication before /a/ (Jacobs:34).

The results in (1) and (2) exemplify the type of palatalization which takes place in an assimilatory environment. That is, in the presence of a front vowel a segment articulated in the back of the mouth comes to be articulated more in the front of the mouth (Bhat 1978; Lahiri and Evers 1991; Hume 1992). What is interesting about these two stages of palatalization is that during the FVP /k/ shifted to [ts], a [+anterior] dental-alveolar affricate,

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[84]Evidence for the fronting of /a/ in Gallo-Roman comes first from the fact that the palatalization of velars typically occurs in the environment of a front vowel (Bhat 1978:52). As well, the historical development of tonic free /a/ to a fronted vowel or diphthong in Modern French may indicate that it was already fronted in Gallo-Roman. For example, Lt. *caru*, OFre. *chier* > Fre. *cher* 'dear', Lt. *pane*, Fre. *pain* 'bread', Lt. *amat*, Fre. *aime* 'he loves' (Straka 1953:289).

[85]With intervocalic voicing.

while /g/ shifted to [dž], a [-anterior] palato-alveolar affricate. During the SVP both velars became [-anterior] palato-alveolar affricates. This matter will not be taken up here but will be discussed later in the chapter. The point I wish to make is that the changes described in (1) and (2) are the result of an assimilatory process in which one segment becomes more similar in pronunciation to another, as will be shown in the two palatalization models presented below. This type of change can be described as segmental rather than syllable structure motivated.

In the next section we will look at "palatalization" effects that differ from those just described in that they are better categorized as syllable structure changes.

### *1.3 Glide strengthening*

One example of a sound change in Early French that has typically been labelled as a "palatalization" (Pope 1952) is glide strengthening.[86] Recall that Head Law (b) predicts that a syllable onset will be as consonantally strong as possible. When a weak glide was in the onset position, head strengthening normally took place in the Romance languages. This occurred before any vowel, whether front or back (Jacobs 1991:33).

| (4) | Latin | Gallo-Roman | French | |
|---|---|---|---|---|
| | juvenem [j] | +[džovenɛ] | jeune [ž] | 'young' |

The fact that we see this type of change occurring with a syllable-initial yod gives us evidence of the heterosyllabic structure of labial consonant + yod sequences in Proto-Romance. In Gallo-Roman, when a labial consonant was followed by a palatal glide intervocalically, the glide underwent head strengthening becoming a [-anterior] palato-alveolar affricate. After head strengthening, the labial consonant in coda position normally was lost.

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[86]Glide strengthening was a relatively late, but productive process that occurred in Gallo-Roman. It must have taken place after the "palatalization" of the dental and velar stops before yod (see section 1.4 of this chapter) and also after gemination before yod (see section 1.5 of this chapter), otherwise it would have bled the environment for these other processes. Pope (1952:129) states that "palatalization" before yod first began with the dental plosives and was followed by the velars. According to Straka (1965:132) palatalization before yod began in the second century. Jacobs (1991:33) states that glide strengthening did not begin until the fifth century.

| (5) | Latin | Gallo-Roman | | Proto-Romance | | French | | |
|---|---|---|---|---|---|---|---|---|
| a. | sapiam | +[sap$tša][87] | (0)[88] | p$i̯ | (-5) | sache | [š] | 'he knows (subj.)' |
| b. | rubiam | +[rob$džu] | (0) | b$i̯ | (-6) | rouge | [ž] | 'red' |
| c. | caviam | +[kaβ$dža] | (1) | v$i̯ | (-3) | cage | [ž] | 'cage' |
| d. | simium | +[sin$džu][89] | (2) | m$i̯ | (-2) | singe | [ž] | 'monkey' |

As these examples show, the strengthening of syllable-initial yod to an affricate lends support to the argument that in the sequence of labial + yod, the labial was originally in the coda position and the glide was in the head position of the following syllable. We can compare the intervocalic developments of these labials to show that the consonants in (5) are not in fact in the onset position.

| (6) | Latin | Gallo-Roman | Proto-Romance | French | |
|---|---|---|---|---|---|
| a. | ripa | ri[β]a | VpV | rive | 'shore; bank' |
| b. | faba | fa[β]a | VbV | feve | 'bean' |
| c. | navem | na[β]e | VvV | nef | 'vessel' |
| d. | famem | fãimə | VmV | faim | 'hunger' |

The different developments of the consonants in (6) compared with their counterparts in (5) indicate that we are not dealing with the same environment. The consonants in (5) are normally lost before strengthened yod while the same consonants undergo spirantization when they are intervocalic and syllable-initial. /m/ did not spirantize but was instead lost after a nasalized vowel.

If we compare the results of (5) with those of (2) we can see why the developments in (5) have sometimes been called "palatalizations". In both cases affricates resulted from these sound changes. However, in (2) we can see that this development is an assimilatory change while the development in (5) is argued to be a syllable contact improvement. The syllable-initial yod strengthened to an affricate in order to improve the contact between it and the preceding consonant. This interpretation of the affrication in (5) as a syllable structure improvement consequently provides us with evidence as to the earlier syllable

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[87]The affricate assimilated in voice to the preceding stop. Evidence of this intermediate stage comes from Old Provençal [saptša] (Hall 1976:148).

[88]As can be seen by the contact evaluation, the voiceless affricate patterns like the voiceless plosive and is therefore given the same consonantal strength value. These contact evaluations are taken from the Consonantal Strength scale presented in chapter one.

[89]The labial nasal assimilated to the following affricate becoming a dental nasal.

structure of the language. The change in (5) leads us to reconstruct heterosyllabic consonant clusters in Proto-Romance.

Jacobs (1991:33) has suggested that the /p/ in (5a) may have geminated before yod as a means of syllable contact improvement; that is, p$i̯ > p$pi̯. According to him, this would explain why the fricative in *sache* is voiceless, since intervocalically a plosive should become voiced in French. However, if gemination did indeed occur, then there would have been no reason for the yod to also undergo strengthening, especially if it was no longer syllable-initial since the syllable contact would already be improved. That is, there is no apparent motivation for p$pi̯ to become p$pdž (or p$pts̆). Alternatively, if glide strengthening occurred prior to gemination, this would likewise bleed the environment for gemination since the contact between [p] and [dž] is already improved. In other words, p$i̯ > p$dž removes the motivation for this cluster to change to p$pdž. Whether gemination took place either before or after glide strengthening, the unacceptable syllable head $pdž would have been created, violating the phonotactic constraints of the language. Instead, it seems more likely that in *sapia*, the syllable-initial glide first strengthened to an affricate, creating an environment in which the plosive was no longer intervocalic, thus voicing of the stop would not occur. The affricate then assimilated in voice to the preceding plosive, producing [ts̆]. Subsequently, the plosive weakened in syllable-final position and was lost.

### *1.4 Coda weakening*

Recall that in our list of syllable structure motivated sound changes presented in chapter one, coda weakening is a way of improving a poor syllable contact when a strong coda is followed by a weaker onset. We see this type of change occurring in the examples below. Before a palatal glide, the stop weakens to yod and is lost (Pope 1952:131).

| (7) | Latin | Gallo-Roman | Proto-Romance | French | |
|---|---|---|---|---|---|
| a. | radium | +[raiə] | d$i̯ | rai | 'ray' |
| b. | corrigiam | +[kɔrrɛiə] | g$i̯ | courroie | 'strap' |

Comparing the developments of these same clusters word-medially after another consonant we see a different development.

| (8) | Latin | Late Latin | Proto-Romance | French | |
|---|---|---|---|---|---|
| a. | hordium | +[ɔrdžə] | C$di̯ | orge | 'barley' |
| b. | Giorgium | +[džɔrdžə] | C$gi̯ | Georges | 'George' |

The results in (8) show that when the plosive was tautosyllabic with the following yod, it assimilated to the yod in becoming a palato-alveolar affricate. The affrication in (8) cannot be a result of glide strengthening as this change only occurred when the glide was in onset position, as discussed in the previous section. Affrication does not occur, however, when the plosive and yod are intervocalic, as shown in (7) where the plosive is lost before yod. If the plosives were in identical positions in (7) and (8), that is, if they were tautosyllabic with the following yod, then we would expect similar results. Yet the divergent outcomes tell us that this is not so. As stated above, we can explain the loss of the stops in (7) as a result of syllable contact improvement if the plosives are in the coda position followed by a weaker onset. This implies that the original syllabification was VC$CV.

If the stops in (7) were intervocalic we might also expect them to develop along the same lines as intervocalic stops.

| (9) | Latin | Gallo-Roman | Proto-Romance | French | |
|---|---|---|---|---|---|
| a. | nūda | +nuða | VdV | nu | 'nude' |
| b. | rūga | +ruɣa | VgV | rue | 'street' |

While the stops in (7) weaken to yod before being effaced, the same stops in (9) become fricatives when between vowels (Pope 1952:124). This implies that the stops in (7) are not syllable-initial.

Earlier we saw that before the front vowels [e] and [i], /g/ weakened to yod, as in Lt. *flagellum*, GR [flaiellɛ] > OFre. *flaiel* 'whip'. This is the same development we see in (7b). How do we know then that Vg̱iV was actually heterosyllabic and not tautosyllabic like /g/ in *flagellum* ? We can see from the development in (8b) that if Vg̱iV was in fact tautosyllabic in *corrigiam* , then we would expect [dž] from this cluster. Since this is not the case, we must account for the different development in another fashion. We can explain the distinct changes as resulting from a difference in syllable structure, with Vg̱iV syllabified as heterosyllabic in Proto-Romance.

The coda weakening in (7) along with the palatalization in (8) provide us with evidence as to the appropriate syllabification of these consonant clusters for Proto-Romance. Intervocalically, plosive-yod stops were heterosyllabic while postconsonantally these clusters were tautosyllabic.

## *1.5 Gemination*

In Early French, gemination also affected certain consonant clusters. When the consonants /k/, /l/ and /n/ were followed by yod intervocalically, gemination was the result. Previously we have explained gemination as a means of improving a nonpreferred syllable contact, which in turn implies VC$CV in Proto-Romance.[90]

| (10) | Latin | Gallo-Roman | Proto-Romance | French | |
|---|---|---|---|---|---|
| a. | faciem | +[fat$tsə] | k$i̯ | face [s] | 'face' |
| b. | liniam | +[liɲɲa] | n$i̯ | ligne [ɲ] | 'line' |
| c. | paliam | +[paʎʎa] | l$i̯ | paille [i̯] | 'straw' |

By only examining the results of palatalization in these examples we miss the important fact that there was also a syllable structure improvement. Linguists like Pope (1952) have suggested that gemination of the velar explains a voiceless reflex in Modern French. Normally we would expect the voiceless segments to undergo intervocalic voicing in French, therefore, the final fricative in (10a) should be voiced. However, the voiceless reflex in (10a) is parallel to the one which developed when /-ki̯-/ occurred postconsonantally, for example, Lt. *arci̯onem*, GR +[artsonə], Fre. *arçon* [s] 'saddlebow'. This indicates that the plosive in (10a) was preceded by another consonant. Gemination of /k/ accounts for this lack of voicing.

Although Pope can account for the lack of voicing of the fricative reflex in (10a), she does not explain what motivates the gemination in the first place. Morin (p.c.) has also indicated that the gemination of the plosive in (10a) can account for the lack of change in the vowel preceding the plosive. In French, stressed [a] > [e] in an open syllable, however, in *face* the [a] remains unchanged, suggesting that the syllable was actually blocked. Yet Morin also provides no motivation for the gemination. Within the Preference Law theory we can explain the gemination of the consonants before yod as a syllable contact improvement once we reconstruct heterosyllabic clusters in Proto-Romance. In the example below I demonstrate a possible derivation of French *face*.[91]

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[90]All of the geminates in (10) degeminated in French following the usual course of development in this language.

[91]Based on Jacobs (1991).

| | | | |
|---|---|---|---|
| (11) | Proto-Romance: | fac$i̯em | |
| | | fak$ki̯a | Gemination-Syllable contact improvement |
| | | fat$tsi̯a | Affrication-Assimilation |
| | | ---------- | Intervocalic voicing-Assimilation |
| | | fat$tsə | Loss of glide, vowel reduction |
| | Old French: | fa$tsə | Degemination |
| | | fas | Deaffrication, apocope |
| | French: | <face> | |

Parallel to the development of /-ki̯-/, Lloyd (1987:261) has suggested that gemination of /t/ also occurred before yod, which explains the voiceless fricative in Fre. *place*, Lt. *platea* (cf. Lt. *mattiam*, GR +[mattsə] > Fre. *masse* [s] 'mass').[92] Jacobs (1991:31, footnote 6) however, takes the position that a voiceless reflex of Vti̯V results from word-final devoicing,[93] which was also prevalent in French (cf. Schwan & Behrens 1913:122-123; Pope 1952:130-131; Richter 1931:82).

In his account of the historical development of consonants before yod in Gallo-Roman, Jacobs (1991:30-31) states that intervocalic /t/ plus yod regularly underwent palatalization to [ts], voiced to [dz], then metathesized with the following yod, a syllable contact improvement. The metathesis accounts for the newly created diphthong which precedes the affricate, for example, Lt. *rationem*, GR +[rai̯zonə] (cf. Late Latin +[rats̯ionɛ]) > Fre. *raison* 'reason' (Jacobs:30; cf. Carton 1974:158). If *place* was also a result of metathesis, then we should expect a diphthong here as well, but this is not the case, suggesting that there was no metathesis in this word.

Perhaps it is the case that the French words which show a voiceless reflex of Vti̯V are a product of gemination as Lloyd (1987) has proposed, and not the result of word-final devoicing as suggested by Jacobs (1991) and others. Gemination of /t/ was not unknown in Gallo-Roman, occurring in some words containing the suffixes *-itia* and *-itium*, for example, Lt. *pigritia*, GR [perettse] > OFre. [peretse] > Fre. *paresse* 'laziness' (Pope 1952:131). The gemination before yod in examples such as these can also be explained as a syllable contact improvement once we reconstruct heterosyllabic clusters in Proto-Romance.

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[92]Before yod the voiceless plosives /t/ and /k/ both became [+anterior] affricates while their voiced counterparts became [-anterior] affricates; that is, /k/ and /t/ became [ts], while postconsonantally /g/ and /d/ became [dž]. Jacobs (1991:40) suggests that the reason for this 'may perhaps be sought in the relative markedness of a system containing two different types of voiced and voiceless affricates'. See section 4.3 of this chapter for further discussion.

[93]The affricate would have become word-final after the loss of the final vowel in Old French.

The examples of gemination shown in (10) plus those suggested for Vt̬V, can be explained as syllable contact improvements. These in turn imply that the poor syllable contact of VC$CV existed in Proto-Romance.

### *1.6 Summary*

We have seen that various sound changes in Early French, such as gemination, coda weakening and glide strengthening, can be uniformly explained as syllable structure improvements once we start with heterosyllabic consonant clusters in Proto-Romance. Although the results of the First and Second Velar Palatalizations often mimicked those of consonant + yod sequences, each of these processes has separate motivations. The palatalization of velars before front vowels was an assimilatory change in which one segment became more like an adjacent segment through the spreading of certain features (Bhat 1978; Lahiri and Evers 1991; Hume 1992). The changes that affected consonant + yod sequences in French, however, are posited as syllable contact improvements. A reexamination of "palatalization" in Early French has shown that the developments of consonant + yod sequences can provide additional confirmation of the claim that Proto-Romance had heterosyllabic intervocalic consonant clusters.

Palatalization in Italian also provides us with support for the reconstruction of VC$CV in Proto-Romance.

## 2. Italian

In section 1.2 of chapter two, I briefly discussed an earlier examination by Salverda de Grave (1930) of the syllabification of consonant clusters in Italian. He determined that separate developments of identical consonant sequences can be accounted for by differences in syllabification. I argued that the examples given could be explained solely on the basis of heterosyllabic consonant clusters. In this section, I take another look at sound changes in Italian which resulted in palatalized consonants. I will show that these developments can also be explained as syllable contact improvements. Before I present the palatalization data I would like to briefly review the proposals made in section 1.2 of chapter two.

## 2.1 *Consonant + liquid*

Recall that S de G (1930:323) was concerned with the distinct developments of words like Italian *origlia* 'eavesdrop' and *orecchio* 'ear' which both evolved from *auricula* 'ear'. S de G stated that *origlia* developed from the intervocalic consonant cluster of [-kl-] which he considered a "single" sound. While this "single" sound theory explains the slope steepening (/l/ > [i̯]), it does not account for the geminate [ʎʎ] that develops. For *orecchio,* S de G argues that the word arose from a tautosyllabic cluster of \$kl which also accounts for the liquid becoming a palatal glide. Again, he does not explain why gemination also occurred. In section 1.2, I tried to show that a reconstruction of heterosyllabic consonant clusters could account for both of these developments. Below I repeat the derivations shown earlier.

| (12) | a. | auricla | | b. | auricla | |
|---|---|---|---|---|---|---|
| | | k\$l | | | k\$l | |
| | | i̯\$l | Coda Weakening | | k\$kl | Gemination |
| | | i̯\$ʎ | Palatalization | | k\$ki̯ | Slope Steepening |
| | | ʎ\$ʎ | Assimilation | | | |
| | | origlia | | | orecchio | |

In (12a), coda weakening occurs as a means of improving the syllable contact between the strong coda and the weaker onset. This yod consequently palatalizes the following lateral. Then the yod assimilates to the palatal liquid, resulting in the "geminate" [ʎʎ].[94] In (12b), we instead have gemination of the strong plosive before the weaker liquid. Gemination produces a plosive in the onset position which creates the environment for slope steepening. This analysis provides a more economical solution to the problem.

## 2.2 *Consonant + yod*

Aside from the various developments we see with consonant + /l/ sequences in Italian, we also see separate developments of consonant + yod sequences. While S de G again proposes that these various changes can be accounted for with different types of syllable structures, I will try to show that these changes can be explained as syllable contact improvements when we reconstruct heterosyllabic consonant clusters for Proto-Romance.

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[94] I put the word geminate in quotes here to indicate that this is not the duplication of a single segment but is the assimilation of one segment to another.

In the table below I show the development of intervocalic consonant + yod sequences as presented by S de G (p. 324-327). Column one shows the development of tautosyllabic consonant + yod sequences as reconstructed by S de G. The middle column shows "intervocalic" sequences and column three indicates S de G's reconstructed heterosyllabic clusters.[95]

Table 3

| V$C̯V | VC̯V | VC$i̯V |
|---|---|---|
| Lt. sa$pi̯a It. sappia [ppi̯] | ----- | Lt. sap$i̯a It. saccia [tt͡š] |
| Lt. ha$bi̯am It. abbia [bbi̯] | ----- | Lt. hab$i̯am It. aggia [dd͡ž] |
| Lt. ca$vi̯a It. gabbia [bbi̯] | ----- | Lt. fov$i̯a It. foggia [dd͡ž] |
| Lt. fi$li̯us It. figlio [ʎʎ] | ----- | Lt. fil$i̯us It. fi[d͡ž]u |
| Lt. te$ni̯o It. tegno [ɲɲ] | ----- | Lt. sen$i̯orem It. se[nd͡ž]ior |
| Lt. cami$si̯a It. camiscia [s̆s̆][96] | ----- | Lt. Perus$i̯a It. Perugia [d͡ž] |
| Lt. pu$ti̯us It. pozzo [tts] | Lt. preti̯um It. pregio [d͡ž] | Lt. capt$i̯are It. cacciare [tt͡š] |
| Lt. me$di̯um It. mezzo [ddz] | ----- | Lt. rad$i̯o It. raggio [dd͡ž] |
| Lt. bra$ci̯um It. brazzo [tts] | ----- | Lt. plac$i̯am It. piaccia [tt͡š] |

### *2.2.1 Gemination*

S de G (p. 324) maintains that "tautosyllabic" /p/ before yod in column one remains unchanged in Italian *sappia* 'know (3rd. sg. subj.)', because /p/ is different enough in articulation from yod that it can remain distinct. The gemination of /p/ is explained as a syllable-initial strengthening. S de G presents similar conclusions for the developments of "tautosyllabic" /-bi̯-/ and /-vi̯-/ (see p. 324). S de G believes that convincing evidence for his argument comes from the fact that original /v/ in *cavia* 'cage' becomes /b/ in Italian, a process which occurs in syllable-initial position. However, the author admits that this change normally occurs when /v/ is preceded by another consonant (p. 324). Similarly, the rest of the "tautosyllabic" segments shown in column one are assumed to have simply assimilated to the following yod. S de G does not account for the resulting geminates in these words, except for the one in *camiscia,* which he claims is a result of syllable-initial strengthening.

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[95]Salverda de Grave does not give the English translations of the Italian examples, therefore, I provide glosses when available.

[96]Rohlfs (1966:403, footnote 1; cf. S de G 1930:326) states that <sci> is the orthographical representation of long [s̆].

In discussing various sound changes in Italian in chapter two, we saw that when a strong coda was followed by a weaker onset, gemination was a means of improving the syllable contact. This is what I contend has occurred with the examples in column one. The stronger consonants doubled before the weaker, heterosyllabic yod. In the case of Italian *gabbia* 'cage', this explains the change of syllable-initial /v/ to /b/ which occurred when /v/ was syllable-initial and preceded by a consonant. It also accounts for the appearance of the geminates which S de G leaves unexplained.

Gemination also seems to have affected some of the consonant + yod sequences in column three, in particular /k, t, d/ + yod. However, we can see that these clusters evolved differently from their counterparts in column one. While the affricates that result from these sequences in column one are [+anterior] dental-alveolar affricates, those in column three are [-anterior] palato-alveolar affricates. It is not exactly clear why palatalization should take two forms. It may be that one group of words developed at a stage in which [+anterior] affricates were being formed and another group developed when [-anterior] affricates were evolving. The different outcomes of palatalization in Italian are similar to those we saw for French. Recall that before yod and the front vowels [e, i], /k/ became [ts] while /g/ became [dž] in French. Yet before fronted [a] both velars became [-anterior] affricates.

Although an adequate solution for this problem is not readily available, the fault does not lie in the Preference Law theory. This framework adequately explains the syllable structure change we see in these clusters, but it is not meant to predict the outcome of assimilatory processes such as palatalization. For this we need a theory which explains segmental changes, such as the ones presented later in this chapter. However, we will see in section 4 that even recent models of palatalization do not predict the outcome of palatalization.

The advantage that this analysis has in comparison to S de G's, is that it can provide a motivation for gemination and requires positing only one type of syllable structure for Proto-Romance, VC$CV. S de G on the other hand must posit two types of syllable structures and still cannot account for the geminate clusters. What remains to be answered is why we have two different palatalization reflexes.

### *2.2.2 Glide strengthening*

Recall that S de G (p. 324) maintained that the /p/ in Italian *sappia* was distinct enough from the following yod to remain intact. However, it is not clear why /p/ is not

distinct enough to be saved in *saccia* where it also occurs before yod. Second, the argument that these consonants become strengthened syllable-initially does not explain the lack of strengthening word-initially, which is also a position of strengthening (cf. Foley 1977:109). That is, these segments do not appear as geminates word-initially. S de G has suggested that the syllable-final consonants in column three were lost before yod and that the yod strengthened to an affricate syllable-initially. If the developments in column three show coda weakening as S de G suggests, then it is not clear where the geminates in the Italian words *saccia*, *aggia* and *foggia* 'fashion; manner' came from. Instead, I would argue that the changes evident in column three are better explained as syllable contact improvements.

I agree with S de G that the yod did become an affricate syllable-initially, but as a means of improving the syllable contact between it and the preceding stronger coda. However, I would suggest that most of the syllable-final consonants were not lost but assimilated to the following affricate. This produced the "geminate" clusters we see in column three. S de G is partially correct in that /l, n, s/ were lost after the glide strengthened to an affricate. Both the assimilation and the consonant deletion created more preferred syllable contacts.

Italian *pregio* in column two may be an instance of glide strengthening with coda weakening. We can see that it differs in development from /t/ plus yod in column one in that no geminate results in *pregio*. The glide strengthening is again the result of a syllable contact improvement. The loss of the syllable-final stop would only improve the contact further. S de G maintains (p. 325) that reconstructing a tautosyllabic cluster in the word *pregio* accounts for the development of the tonic vowel. Tonic /e/ normally became /i/ in a closed syllable. The maintenance of /e/ in *pregio* would then seem to indicate that the cluster was in fact tautosyllabic. However, Rohlfs (1966:72) has indicated that in certain Italian dialects /e/ was sometimes retained even in a closed syllable, for example, Pitigliano (southern Tuscan) has *lengua* for standard *lingua* 'language' and *spenta* for *spinta* 'push, shove' (cf. Grandgent 1927:42, note 1; Pei 1954:36, footnote 8). This may support the claim made here that the /e/ in *pregio* was actually in a closed syllable. As well, we have seen that /l, n, s/ in column three were lost after the glide strengthened to an affricate, therefore providing a precedence for the change in *pregio*. A possible derivation for *pregio* is: pret$i̯um > pret$džo > It. *pregio*.

An alternate solution which has been suggested to me (Robert Murray, p.c.) involves the retention of vocalic /i/ after the dental plosive which would mean that *pretium*

remained trisyllabic. Being in syllable-initial position with the high front vowel, the dental assibilated to [ts], voiced to [dz] and then shifted in place of articulation to become the affricate [dž]. Rohlfs (1966:409) makes a similar suggestion but assumes /i/ has become nonsyllabic yod. Under this analysis we would not have to account for the loss of syllable-final /t/ or explain why the /e/ remained unchanged in *pregio*.

*Cacciare* (< capt$i̯are) in column three shows the syllable division between the dental plosive and yod. S de G (p. 325) states that the syllable break between the plosive and the yod is based on a morphological division between the root and the suffix and accounts for the development of the (almost exclusive) group of verbs which undergo this phonological change. I would agree with S de G that this is the correct syllabification for this word given that the change in *captiare* parallels the development of similar clusters in column three. The syllable-final cluster in capt$i̯are was likely simplified. This still left a nonpreferred syllable contact to be improved. As a result, the syllable-initial glide strengthened to an affricate and the remaining stop assimilated to the affricate, producing the apparent geminate in *cacciare*. For example, capt$i̯are > capt$džare > cap$džare > cad$džare. In *pozzo* in column one, syllable-initial /-ti̯-/, which was a result of gemination, became the affricate [ts]. This is identical to the development of /t/ plus yod following a consonant, for example, Lt. al$ti̯are, It. *alzare* [ts] 'to raise' (S de G:324). If /t/ plus yod were tautosyllabic in *cacciare*, then we might expect the affricate [ts] to develop; instead we get [dž].

I believe that S de G's "tautosyllabic' reflexes in column one are actually a result of gemination while the examples in column three derive from glide strengthening with either assimilation or coda weakening. Gemination also affected some stop + yod sequences in column three. Both sets of changes were motivated by a need to improve a poor syllable contact between heterosyllabic consonant clusters. An example of some of the changes we have seen are demonstrated in the following:

| (13) | Proto-Romance: | sap$i̯a | Proto-Romance: | sap$i̯a |
|---|---|---|---|---|
| | Gemination: | sap$pi̯a | Glide Strengthening: | sap$dža |
| | | | Voice Assimilation: | sap$tša |
| | | | Assimilation: | sat$tša |
| | Italian: | sappia | Italian: | saccia |

### *2.3 Summary*

I have tried to show in this investigation of consonant +-yod sequences in Italian that palatalization effects can be helpful in determining the syllabification of intervocalic consonant clusters in Proto-Romance. Glide strengthening and gemination provide explanations for the apparently exceptional developments of identical clusters in Italian. Furthermore, I attempted to show that we can account for divergent sound changes with a single syllable structure: heterosyllabic consonant clusters. The arguments presented here resolve some questions about these changes without the weaknesses of earlier proposals. However, it still remains to be answered why the palatalization of consonants in identical environments produces different types of segments.

Next we will take a look at Romanian in which seemingly identical consonant clusters also undergo separate developments.

## 3. Romanian[97]

The changes from Romanian presented in this section do not show syllable contact improvements, but nevertheless argue for heterosyllabification of certain dental stop-yod clusters in Proto-Romance. Below we see the development of dental stop-yod sequences. (14) shows how these clusters developed when stress preceded the cluster and (15) shows the pretonic changes of these clusters.

(14) V́d$i̯ > [dz] (> [z])
V́t$i̯ > [ts][98]

| | Latin | Romanian | | Proto-Romance | |
|---|---|---|---|---|---|
| a. | mĕdiu | miez | [z] | V́d$i̯ | 'core; kernel' |
| b. | hordeu | orz | [z] | V́Cd$i̯ | 'barley' |
| c. | negotiu | negoţ | [ts] | V́t$i̯ | 'trade' |
| d. | scortea | scoarţă | [ts] | V́Ct$i̯ | 'leather garment' |

[97]Examples in this section are from Nandris (1963) or DuNay (1977).
[98]Intervocalic voiceless consonants had a tendency to remain voiceless in Romanian (Nandris 1963).

(15) $di̯V́ > [dž] (> [ž])
$ti̯V́ > [tš]

| | Latin | Romanian | | Proto-Romance | |
|---|---|---|---|---|---|
| a. | adjutare | ajuta | [ž] | $di̯V́ | 'to help' |
| b. | deo(r)sum | jos | [ž] | $di̯V́ | 'low; down' |
| c. | +fetiolu | fecior | [tš] | $ti̯V́ | 'boy; son' |
| d. | matteuca | măciucă | [tš] | C$ti̯V́ | '?' |

Nandris (1963:128) has suggested that different stress patterns explain the syllabification and evolution of these clusters. When stress fell on the vowel preceding the stop-glide cluster, the cluster tended to be heterosyllabic: V́d$i̯ and V́t$i̯. This is not unexpected as stressed syllables have a tendency to attract consonants (Allen 1973:79-80).[99] If stress fell on the vowel following the plosive-yod combination, the plosive was once again attracted to the stressed syllable so that $di̯V́ and $ti̯V́ were the result.

As I mentioned, these heterosyllabic clusters did not undergo any syllable contact improvement. A possible reason for this may be that the plosive and yod assimilated before any changes could occur. The coalescence of the plosive and yod would then make any contact repairs unnecessary.

Although we have two sets of syllable structures, VC$i̯V and V$Ci̯V, I would argue that the original one contains the heterosyllabic cluster. This is based on the reconstructions previously posited for Romanian (see section 3, chapter two) and in the other Romance languages. As indicated by Nandris, stress may have played a role in the creation of V$Ci̯V, that is, the stressed syllable may have attracted the dental in coda position to the following onset position. Once the consonant shifted to the onset position the syllable contact would have also been improved.

The sound changes evident in Romanian again show us that we may derive information concerning syllable structure from palatalization processes. We can account for the same clusters undergoing separate developments if we reconstruct different syllable structures. The changes we have shown here help support the reconstruction of VC$CV clusters in Proto-Romance.

In the following section we discuss two contemporary approaches to the description of palatalization.

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[99]It is also true that heavy syllables tend to attract stress (Goldsmith 1990:113). Given that the syllables preceding the dental stops receive primary stress in the examples in (14), this seems to argue further that these syllables were in fact heavy, indicating that the stop and glide were heterosyllabic.

## 4. An Examination of Palatalization[100]

The final part of this chapter examines two accounts of palatalization. The first is from Lahiri and Evers (1991) and the second is from Hume (1992). While both models are quite similar, being based in the feature geometry framework (Clements 1985, 1987, 1990), Hume's proposal provides a more natural account of palatalization.

The purpose of this discussion is twofold. First, it will help in our understanding of the processes at work in assimilatory palatalization. Second, it will show that although there exist models which can describe palatalization, these models lack the power to predict the type of segment that will result from this process; for instance, whether a velar will become a [-anterior] or [+anterior] affricate. As the reader will recall, both of these developments took place in the history of French, Italian and Romanian.

### *4.1 Lahiri and Evers (1991)*

Lahiri and Evers (1991; hereafter L & E) discuss the process of palatalization, in particular, palatalization of coronals before front vowels and yod. These authors maintain that the assimilatory process of palatalization cannot be a single process and that the characterization of the segments which precipitate palatalization, the front vowels and yod, is controversial (p. 79). In their paper L & E (p. 79-80) argue three main points: (1) 'that the interaction of certain consonants and vowels in palatalization processes argues for a unitary set of features'; (2) in their feature geometry representation coronal consonants, front vowels and yod are all under the articulator node Coronal; and (3) their proposal 'can naturally account for different types of palatalizations as well as processes that independently require only the tongue height features'.

For clarity I adopt the definitions used by Hume (1992:164), who states that '[i]n Palatalization, the consonant acquires a vowel-like articulation while maintaining its original major place of articulation. In Coronalization, a front vocoid affects a change in the consonant's major place of articulation, either from velar to nonanterior coronal, or from anterior coronal to nonanterior coronal'. An example of Palatalization is /k/ > [k̲i̲] and an example of Coronalization is /k/ > [t̆s̆] or /t/ > [t̆s̆].

L & E (p. 80-81) describe the three most common palatalization processes :

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[100]For a thorough description of the phonetic correlates of coronality and palatalization see Hume (1992, chapter two).

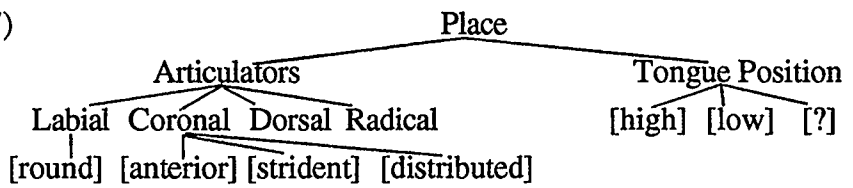
(16) a. Fronting of velars:
The fronting of velar consonants usually occurs when followed by a front vowel such as [i] or [i̯]. Normally, the velar becomes palato-alveolar 'with a concomitant change of stops to affricates'.

b. Change of place for coronal consonants:
Alveolar and dental consonants become palato-alveolar or prepalatal in the environment of front vowels and yod. Stops tend to become affricates but other consonants normally retain their manner of articulation.

c. Secondary palatal articulation:
This process involves any consonant and involves central tongue raising 'while keeping the main articulator intact'. It occurs in the environment of a high front vowel or yod, 'often with a prominent front off-glide articulation'. All high vowels can cause this secondary articulation with dentals or alveolar consonants, and strident sounds such as [s] and [s̆] are often produced, that is, either with or without change of place.

Since palatalization is usually considered an assimilatory change, achieved through the spreading of features (Clements 1976), the triggers of palatalization, the front vowels and yod, should share common features with the outputs of the assimilation, the palato-alveolar consonants (L & E:81). As L & E (p. 86) see it, a workable feature geometry representation must have the following three attributes: '(1) ability to express multiple articulations naturally, (2) ability to characterize vowels and consonants by a single set of features in order to capture natural classes without duplication, and (3) ability to express assimilatory (spreading) processes like palatalization, which lead to secondary articulation as well as to major place changes in a direct way'. Drawing from Clements (1989), L & E (p. 87) present a hierarchical feature tree which 'has a unitary set of place features for consonants and vowels, but also a separate node where the so-called tongue-body features are defined'.[101]

(17)




One of the features under the Tongue position has been left empty 'since further research is necessary to determine whether other features are necessary for additional height classifications' (p. 87). The features under the Tongue Position node are binary in nature

[101]A separate node for tongue-body features is required in order to refer to 'natural classes of vowels by their height features alone' (L & E:86).

while the other articulators are privative. Coronal accounts for all [-back] segments and Dorsal describes [+back] segments. The feature [strident] is dependent on Coronal since only coronal consonants can be strident. The Radical node is created for guttural consonants, which are not relevant in their discussion. The features under the Tongue position may undergo individual spreading or the entire node may undergo spreading.

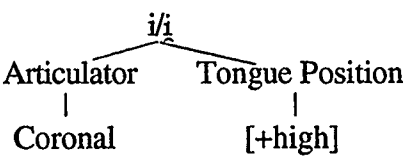
L & E (p. 89) define [round] as a sound made with un/rounded lips, and [anterior] as a coronal sound 'made before or after the palato-alveolar region'. The articulatory definition of [distributed] is 'constriction formed by the tongue extending for either a considerable amount or a short distance'. This means that a segment that is [distributed] has the tongue extended for a longer amount of time than a segment that is not [distributed]. The feature [strident] is described acoustically and refers to 'coronal sounds that have a considerable amount of high frequency noise'. Because there are different and inexact definitions for Tongue position, L & E (p. 89) describe the tongue position articulatorily as 'raising the tongue body' and acoustically, so that height is captured by the first formant frequency, '[+high] being inversely correlated with F1'. 'That is, the lower the first formant, the higher the vowel'. In this representation, height can distinguish vowels and consonants.

Given L & E's feature tree, we can now examine how they account for palatalization and secondary articulation.

### *4.1.1 Palatalization and secondary articulation*

Below is a representation of [i] and [i̯] using L & E's feature geometry tree (p. 90).

(18)

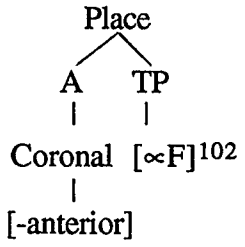



Using X-ray data, Keating (1988:89) argues that palatal segments like yod involve using the tongue blade 'along with a simultaneous raising of the tongue body' (L & E:90). Being Coronal and [high], and also Dorsal since they are made with the tongue body, palatals are considered complex segments.

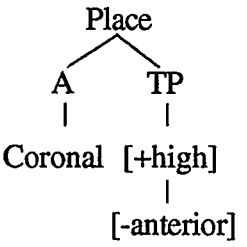
The three palatalization processes described at the beginning of this section involve the dental-alveolar, palato-alveolar and velar places of articulation, along with the front

vowels and palatal glide. The feature representations of these segments are presented below (L & E:90).

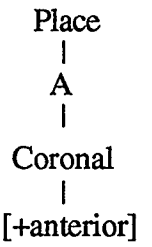
(19) Front Vowels



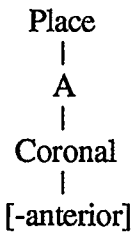

[i]




Dental-Alveolar




Palato-alveolar




Velar


The palatalization processes of (16 a-c) are expressed below (L & E:90).

(20) a. Fronting of velars:
'Spreading the Coronal Node (along with the [-anterior] feature) with the concomitant deletion of the Dorsal Node for the velar fronting'.

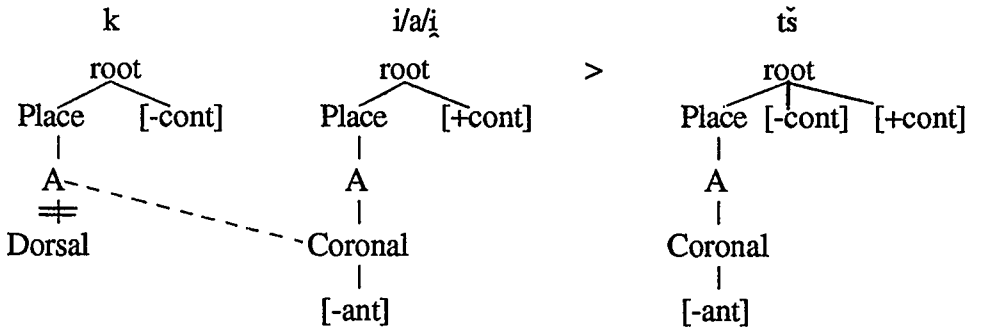
b. Change of place for coronal consonants:
'Spreading of [-anterior] within the Coronal class node for dental-alveolar consonants becoming palato-alveolar'.

c. Secondary palatal articulation:
'Spreading of [+high] to all places of articulation for the secondary palatal articulation'.

As stated in (20a), the Coronalization of velars before front vowels and yod involves the spreading of [coronal]. This is illustrated in (21).

[102] [∝F] denotes the different [high], [low] features of the front vowels.

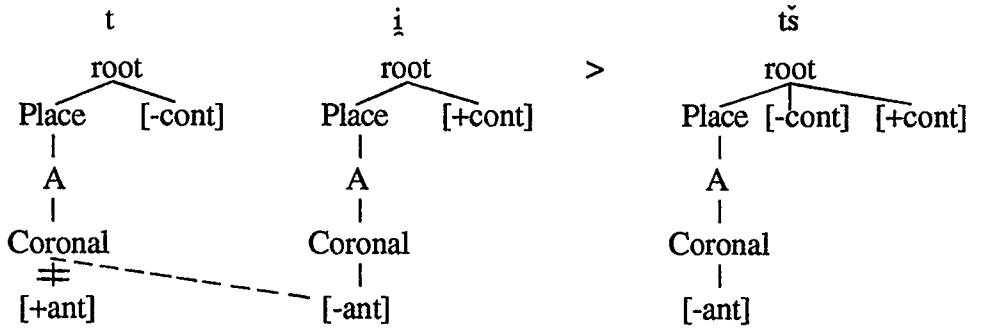
(21)




L & E (p. 91) dismiss an earlier notion from Jacobs (1989:113-159) who claims that an affricate develops from a stop through the spreading of the feature [+cont]. According to these authors, continuancy is redundantly present for a [-anterior] affricate produced in the palato-alveolar region. This accounts for the presence of the added feature [+continuant] in the representation of [t͡s̆] above.

In the change of place for coronals, which is also characterized as Coronalization in Hume (1992), the feature [-anterior] is spread within the Coronal node (p. 91). Since front vowels and palatal glides are considered [-anterior], the dental-alveolar consonant also becomes [-anterior]. This explains why a dental or alveolar consonant may become articulated further back in the mouth even though it is in the environment of a front vowel or palatal glide. Although there is a change of place, the primary articulator, Coronal, remains unchanged. Based on this analysis, I show a representation of this second type of Coronalization.

(22)

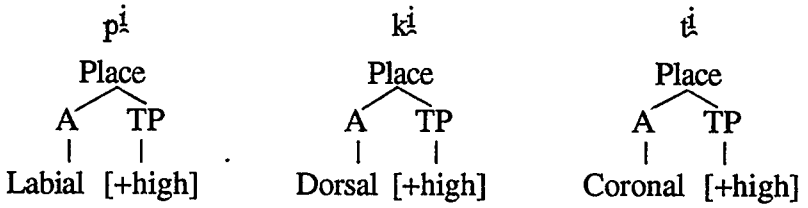



This type of palatalization can be accounted for as an assimilation process since the target and the trigger share the feature [coronal].

In L & E's representation, multiply articulated complex segments, such as those with secondary articulation, have a combination of two articulators (p. 92). Palatalization involves the spreading of [high], which is not dependent upon any major articulator. Any

type of consonant can undergo secondary palatal articulation via the spreading of [+high], thus "fronted velars", "raised labials and dentals" can be represented uniformly.

(23)




If all secondary palatal articulations have primary articulators with [+high] features, then these segments should constitute a natural class. As well, if [+high] is the feature that is spreading, any [+high] vowel should trigger this process, not just Coronals (p. 93). Evidence from Russian shows that vowels do raise after palatalized consonants which supports the claim that palatalized consonants are [+high]. In Japanese, dentals affricate before the high vowels [i, ɯ], thus supporting the second claim (p. 93).

L & E acknowledge that there are two issues their analysis raises. One is the fact that acoustically, palatalized consonants show a rise in the second formant, a characteristic that is associated with front or coronal segments. The second is that nonhigh front vowels may also produce secondary palatalization (p. 94).

Hume (1992) raises other issues with L & E's account of Palatalization as the spreading of the feature [high]. First, she states (p. 178) that the reason L & E must describe Palatalization as the spreading of [high] as opposed to [coronal], which she uses in her model, is because in L & E's model the feature [coronal] is on the same plane for both consonants and vocoids, as shown in (22). The problem with having coronal on the same plane for both consonantal and vocoidal segments, aside from the fact that having this single tier representation makes incorrect predictions for consonant-to-consonant and vowel-to-vowel assimilations (see Hume 1992:chapter four), is that the feature [coronal] then cannot be used to account for Palatalization since it would then make the process of Palatalization indistinguishable from Coronalization in this model.

The second point Hume makes is in reference to the evidence L & E use to support their use of the feature [high] in describing Palatalization. Hume (p. 178-179) claims that the sound change in Japanese in which /t/ affricates before the front vowel [i] (/t/ > [tš]) is not actually Palatalization because no secondary articulation is added to the dental. Instead, the dental undergoes Coronalization. In fact, Hume argues that the change of /t/ to [ts] before the high back vowel [ɯ] in Japanese is not even one of Coronalization since there is

no change in place of articulation. Instead, this is an instance of the spread of [+continuant]. Therefore, Hume believes that evidence from Japanese regarding the feature [high] cannot be used to support the claims made by L & E.

### *4.1.2 Secondary palatalization, phonetic off-glides, and coronality*

In responding to the first problem raised by their analysis of Palatalization as the spreading of [high], L & E (p. 94) argue that the reason palatalized segments have a rise in the second formant, a feature of high front (coronal) vowels, is because palatalized ([+high]) consonants are produced with a yod-like off-glide. The authors state that it is difficult to show if this off-glide is an added feature resulting from the palatalized [+high] consonant or whether the following vowel has acquired an on-glide. For example, in English *allusion*, if the [l] is palatalized it is followed by [i̯] then [u], that is [-li̯u-]. Does the high vowel cause the consonant to raise or is the [u] produced with an on-glide which causes the raising?

With regards to cases in which nonhigh front vowels such as [a] induce secondary palatalization, the palatalized consonant is also produced with an off-glide according to L & E (p. 95). Again, it is possible that the off-glide could instead be an on-glide of the vowel. L & E (p. 95) suggest that if the glide is an on-glide, the vowel would actually be [i̯a]. Given this assumption, the authors predict that diachronically the on-glide may trigger palatalization of the preceding consonant and then subsequently get absorbed by the vowel. They go on to suggest that if the palatalized consonant has a fronting effect on neighbouring vowels, then the on-glide has not been absorbed and is actually the cause of the fronting of these vowels (p. 95).

In Acadian French, a velar may optionally undergo Palatalization or Coronalization before a nonhigh front vowel, for example, [kɛ] ~ [ki̯ɛ] ~ [tšɛ] (Hume 1992:161). Because Palatalization is only one change the velar can undergo in this dialect, Hume (p. 180-181) states that adopting L & E's proposal that Palatalization before a nonhigh front vowel requires the presence of an onglide on the vowel, 'would require including the ad hoc stipulation that an abstract segment is present underlyingly just in case the output is a palatalized consonant'. That is, an onglide would only be posited for the underlying representation if Palatalization and not Coronalization was the outcome. Hume states that Palatalization would involve the assimilation to the onglide rather than to the front vowel. For Coronalization, however, L & E assume that the consonant is assimilating to the front vowel itself. This would mean that even though Palatalization and Coronalization are

conditioned by the same environment, the similarity of the two processes is lost in L & E's account of palatalization. Because of these problems, Hume presents an alternate account of Palatalization and Coronalization in which the feature [coronal] induces both processes.

## *4.2 Hume (1992)*

Within Hume's model the place features of consonants and vocoids are partially segregated; that is, they are on separate tiers (p. 171). This representation allows Hume to account for Palatalization and Coronalization as the result of the spreading of the feature [coronal]. In this section I present Hume's unified analysis of Palatalization and Coronalization.

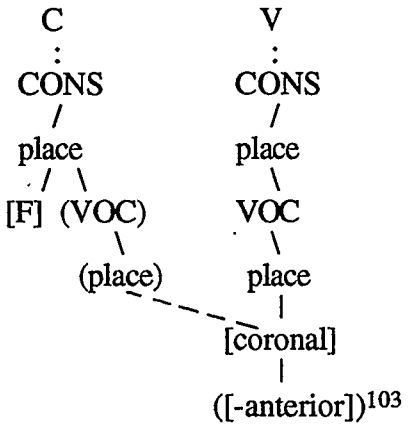
### *4.2.1 Palatalization*

Within this bi-planar analysis for the organization of place features for consonants and vocoids, Hume (1992:172) shows that 'a given feature can link to either the consonantal or vocoidal plane, . . . [or] a given feature may link to both planes simultaneously, perhaps as the result of spreading'. As well, a feature may spread from one constriction plane to another. With regards to spreading of features, Hume (p. 173, following Paradis 1988 and Piggott 1988), employs the parametric rule given in (24).

(24) Constriction Status Change (CSC)? no/yes

In Palatalization, the feature [coronal] spreads from the vocoid to the consonant so that the consonant is produced with an i-like articulation (Hume:176), for example, /k/ + [i̯] > [kʲ]. As such, the constriction feature of the vocoid remains unchanged during Palatalization; therefore, the no, or unmarked, option of the CSC is chosen. Palatalization as a feature spreading procedure is shown in (25) (from Hume:176). [F] denotes a place feature.

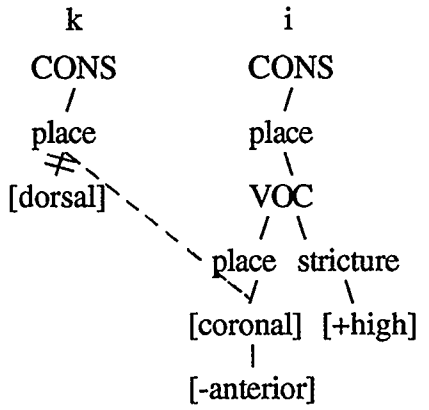
(25) Palatalization:
Constriction Status Change: no



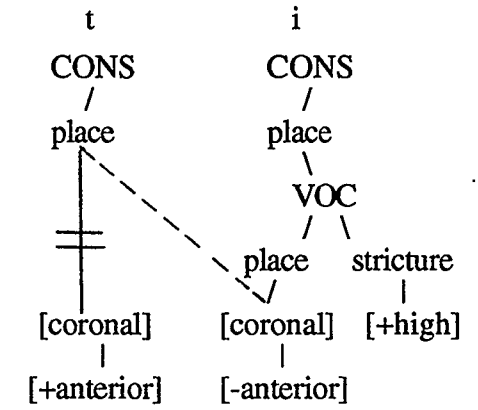

To capture the fact that Palatalization and Coronalization are conditioned by the same environment yet produce different outcomes, Hume (p. 181) argues that both Palatalization and Coronalization are the result of the spreading of [coronal]. However, in Coronalization the major articulator features of the target changes to [coronal, -anterior]. While vocoidal segments retained their constriction status during Palatalization, Hume (p. 181) states that in Coronalization the vocoidal segment becomes consonantal which results in a change of constriction status. The feature [-anterior] of the vocoid is filled at some point during Coronalization (p. 182).

(26) Coronalization:
Constriction Status Change: yes

a. /k/ > [tš]




b. /t/ > [tš]




[103]In Hume's model, coronal segments are redundantly [-anterior], therefore, the feature is bracketed to show the optionality of including the feature in the representation.

During Coronalization, the major place feature of the consonant is delinked and the consonant acquires the features [coronal, -anterior] from the vocoid.[104] The change from a velar or dental consonant to a postalveolar affricate is a direct change rule (p. 183). An intermediate stage of palatalization is not required.[105]

Hume (p. 185-186) observes that in nonlinear phonology, the more complex a rule is the more marked it is predicted to be. The representation of Coronalization is more complex than Palatalization in Hume's model since Coronalization involves a change in the place features of the vocoid, from vocoidal to consonantal, but in Palatalization there is no change. Therefore, it is predicted that Coronalization is the marked rule . Referring back to Acadian French, where a velar or dental stop can either undergo Palatalization or Coronalization before a nonhigh front vowel, Hume notes that older speakers normally demonstrate Coronalization while younger speakers show Palatalization. This suggests that the shift from Coronalization to Palatalization is a shift from a marked to unmarked pronunciation.

### *4.3 Comments*

Having reviewed two models of palatalization, we can now see how these models help in describing the palatalizations we have seen in the Romance languages discussed earlier.

The most important thing to note in these last two sections is that neither model predicts the outcome of Coronalization. In her description of Coronalization, Hume (1992) only mentions the development of [-anterior] palato-alveolar affricates, as do Lahiri and Evers (1991). In neither piece of work do these authors address the problem of predicting whether the outcome of Coronalization will be a [-anterior] or [+anterior] affricate, although L & E (p. 91) do mention that if an affricate is produced in the palato-alveolar region, it is usually [-anterior] (cf. Lahiri and Blumstein 1984:138-139). Recall that in pre-Old French, the velar stops affricated before the front vowels [e, i]. The reflex of the voiceless velar was [ts], as in [tsent] (cf. Lt. *centum* ) > Fre. *cent* 'hundred', but the

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[104]The added features of continuancy and stridency acquired by the consonant during Coronalization is the result of a (language-specific) redundancy rule and is not spread from the vocoid (Hume:189; cf. Lahiri and Evers 1991:91).

[105]This is in keeping with Bhat (1978:68) who also claims that reconstructions of affrication that require an intermediate stage of Palatalization are not valid. This is based on the observation that modern languages that show consonants with secondary palatalizations are restricted to a few areally connected languages, and that this process normally affects the entire sound system, not just a few segments.

voiced velar became [dž], as in [džent] (cf. Lt. *gentem* ) > Fre. *gens* 'people'. No satisfactory accounts have been presented which would explain this distinct development. Later in Gallo-Roman, both velars underwent identical developments in becoming [-anterior] palato-alveolar affricates before fronted [a]: /k/ > [tš] and /g/ > [dž]. In the first stage of palatalization in pre-Old French, voiceless dental and velar stops became [+anterior] affricates while their voiced counterparts became [-anterior] affricates. The examples below are from Jacobs (1991:30).

| (27) | Latin | Late Latin | French | |
|---|---|---|---|---|
| a. | rationem | +[ratsi̯onɛ] | raison | 'reason' |
| b. | faciem | +[fat$tsə] | face | 'face' |
| c. | hordium | +[ɔrdžə] | orge | 'barley' |
| d. | Giorgium | +[džɔrdžə] | Georges | 'George' |

Although Jacobs (1991:36) can derive the [-anterior] and [+anterior] affricates that are produced with a number of redundancy rules, for instance, a segment which is [+coronal, +high, -back] is redundantly [-anterior] and all other [+coronal] segments are [+anterior], he cannot explain why the voiceless stops become [+anterior] before yod while the voiced stops become [-anterior]. He suggests (p. 40) that having two types of voiced and voiceless affricates may reflect the markedness of the phonological system, although he does not pursue this line of thinking.

According to Straka (1965:132), the course of palatalization in French was as follows: first, the dental and velar stops palatalized before yod in Latin Latin (late Proto-Romance in our terminology); second, the velar stops palatalized before the front vowels [e, i]; finally, the velars palatalized before the fronted vowel [a]. At the time of the first palatalization, Proto-Romance apparently contained no palatalized or palatal consonants in its phonological system; these only emerged later (Jacobs 1991:29). Presumably this left the phonological system with ample space to be filled by any newly created segments. Since there was no overcrowding in the system at this time, there seems to be no reason why the voiceless segments should be pushed into a [+anterior] place of articulation while the voiced velars were articulated in a [-anterior] position. In other words, there appears to be no inherent reason for assuming that having two types of voiced and voiceless affricates should be an issue of markedness as Jacobs (1991) has suggested. Given that [-anterior] affricates (L & E:91) are more common than [+anterior] affricates, we would expect that both sets of stops would become [-anterior], but this was not the case.

In her description of Coronalization, shown in (26), Hume (p. 182) notes that the vocoid feature [-anterior] must be filled at some point during the derivation. Kenstowicz (1994:467) has suggested that the point at which this feature is filled may determine whether a dental-alveolar or alveopalatal affricate results. If the feature is inserted at the beginning of the derivation, then a [-anterior] affricate would be produced, i.e., [tš] or [dž]. If the feature is inserted after the derivation, then a [+anterior] affricate would be produced, possibly [ts] or [dz]. Since [-anterior] affricates are the normal result of Coronalization, I would suggest that there is a redundancy rule which makes all coronal affricates [-anterior].

(28) Coronal Affricate Redundancy Rule
[+coronal]$_{\text{Affricate}}$ -> [-anterior]

Because this rule predicts the most common type of affricate, it may be considered unmarked. If the redundant vocoid feature [-anterior] is added to the coronal vocoid at the beginning of the derivation, the unmarked setting, then a [-anterior] affricate will be produced during Coronalization. To produce the [+anterior] affricate, the vocoid feature would have to be inserted after the derivation, the marked setting.[106]

In the very first stage of palatalization in French, in which the dental and velar stops coronalized before yod, both marked and unmarked affricates were produced. This means that the insertion of the feature [-anterior] would be required at two different stages of the derivation in order to produce the correct results. During the next stage of palatalization (Coronalization of velars before the front vowels) we would again have both marked and unmarked affricates being created in the language system. In the final stage of Coronalization, however, only unmarked [-anterior] affricates were created from both the voiced and voiceless velars.

Earlier Hume suggested that in Acadian French there was a movement from Coronalization in the speech of the older community to Palatalization in the speech of the young. During the course of late Proto-Romance to Early French, there seems to be a similar pattern of moving from a marked system to an unmarked system. In the first stage of palatalization, both marked and unmarked affricates were created. This was also true in the second stage of palatalization. In the final stage, however, only unmarked affricates were produced. Assuming the rule presented in (28), we can account for the shift from the

[106]In acquiring the language, children would go from the unmarked to marked setting by hearing [+anterior] affricates in the speech of those around them. That is, only positive evidence would be required.

development of [+anterior] and [-anterior] affricates in the initial stages of palatalization and the creation of [-anterior] affricates in the final stage of palatalization as a shift from a marked to unmarked system. However, this account, like Jacobs (1991), does not answer the question of why voiceless stops should become [+anterior] affricates while voiced stops become [-anterior]. As well, we need to discover if the claims I have made for French hold true for other Romance languages that show divergent palatalizations, such as Italian and Romanian. Recall that in Italian and Romanian it was possible for voiced and voiceless stops to become either [+anterior] or [-anterior] affricates. It may be the case in these languages that there were two stages of palatalization which showed a shift from a marked to unmarked system. That is, in an early stage [+anterior] affricates were produced and at a later stage [-anterior] affricates were created in the same environment. Or, it may be that there existed at a single stage in the language a marked system in which both [+anterior] and [-anterior] affricates were simultaneously being produced. Further research in this area is obviously required in order to find support for one of these positions. The results of such a study may then provide us with a clearer understanding of palatalization in general.

### *4.4 Glide strengthening*

Unlike Lahiri and Evers (1991), Hume (1992) tries to account for the strengthening of yod in syllable-initial position. Recall that in many of the Romance languages a yod strengthened to an affricate after a stronger, heterosyllabic consonant. This was explained as a syllable contact improvement on the basis of heterosyllabic consonant clusters in Proto-Romance. As Hume (p. 80-81) indicates, the strengthening of yod is not a segmental change based on assimilation but is instead dependent on syllable structure. She accounts for the change from yod to affricate with a rule which changes a vocoidal segment into a consonantal segment. For this she gives the following rule.

(29) Glide Strengthening (Hume 1992:81)

$[F]_{VOC} \rightarrow [F]_{CONS} \; / \; \sigma[\_\_\_ V$

Hume (p. 81) also assumes that the reflex of the glide strengthening rule receives the feature [-sonorant] via a redundancy rule.

Although Hume's rule accurately captures the change in status of the yod from a vocoid to a consonant, she still does not explain why this change should occur in the first

place. It is obvious from her rule that the strengthening of a glide is not derived from feature spreading, so why does the glide strengthen? We have seen that a syllable-initial glide often strengthens when it is preceded by a stronger coda. The motivation for the strengthening is syllable contact improvement, as has been stated repeatedly. However, this kind of motivation is not represented in the feature trees we have seen in either L & E's or Hume's models. This is indicative of the fact that certain sound changes occur above the level of the segment and thus are not always able to be expressed in standard frameworks. It is in this domain that the Preference Law are better able to explain sound changes that other frameworks cannot.

### *4.5 Summary*

In this chapter I examined various sound changes in three Romance languages which have traditionally been labelled as "palatalizations". We saw that a number of these changes are more accurately described as affrications which result from syllable structure improvements. By separating segmental palatalizations that result from assimilation, from syllable contact changes we provided additional support for the reconstruction of heterosyllabic consonant clusters in Proto-Romance.

The last part of this chapter was devoted to formal descriptions of palatalization. Although both models could adequately explain "Palatalization" and "Coronalization", neither predicted the outcome of Coronalization; that is, whether the result of this process would be a [-anterior] or [+anterior] affricate. I attempted to show that the creation of both types of affricates in the first two stages of palatalization in French and the creation of only [-anterior] affricates in the final stage of palatalization reflected a movement from a marked to unmarked system. However, I was unable to account for the fact that only voiceless segments became marked affricates. A larger study which examines palatalization in the other Romance languages may be able to provide an answer to this seemingly unresolvable question. Finally, we saw that certain syllable contact changes, such as glide strengthening, can be described in the form of a segmental rule but the motivation behind such a change is not obvious. The Preference Laws provide the motivation for these types of syllable structure changes.

The final chapter of this thesis examines the implications that the reconstruction of heterosyllabic consonant clusters has on the traditional view of the evolution of the Romance languages.

# Chapter Five

# THE EVOLUTION OF THE ROMANCE LANGUAGES: EVIDENCE FROM PROTO-ROMANCE SYLLABLE STRUCTURE

## 0. Introduction

Over the years there has been a continuing debate over how the Romance languages evolved, whether directly from Classical Latin, with an intermediate stage of "Vulgar Latin", or distinctly, from a sister dialect of Classical Latin, which I have labelled Proto-Romance. I will attempt to show that a direct, linear development of the Romance languages from Classical Latin cannot be maintained if we accept the reconstruction presented in this paper. Instead, we must argue for the development of these languages from a separate but related source, namely Proto-Romance. I find support for this claim from the prosodic differences between Classical Latin and the reconstructed proto-language.

In the first part of this chapter I present previous arguments both for and against the direct development of the Romance languages from Classical Latin.[107] Then, on the basis of the reconstruction I have argued for throughout this paper, I will show that the difference in prosodic structures between Classical Latin and Proto-Romance supports the claim that these two forms of language were actually sister dialects; Classical Latin being spoken by an educated upper class and Proto-Romance the dialect common to all speakers. From the "common" tongue the Romance languages evolved.

## 1. Alternate Views on the Development of Romance

### *1.1 Proto-Romance as the daughter of Classical Latin*

The following section includes brief statements from various authors supporting the claim that the Romance languages evolved linearly from Classical Latin with an intermediate stage of what is commonly called Vulgar Latin.

Grandgent (1962:3-4) remarks, 'What we call Vulgar Latin is the speech of the middle classes, as it grew out of early Classic Latin. It is not an independent offshoot of Old Latin: it continues the Classic, not the primitive, vowel system'. According to this

[107]I will be giving only brief statements and samples of evidence from the authors mentioned. For a more extensive discussion of the issues raised here, the reader is advised to refer to the works listed.

author, Vulgar Latin diverged from Classical Latin because it was spoken in so many different areas and influenced by the indigenous people of the area. One of the reasons Grandgent believed Vulgar Latin was a continuation of Classical Latin is because they shared common features such as vocabulary, for example, *canis* 'dog', *filius* 'son' and *mater* 'mother' (p. 6).

Muller and Taylor (1932:iii) state that Vulgar Latin was a colloquial, or "ungrammatical" form of speech spoken by the uneducated that developed directly from Classical Latin. They maintain that Vulgar Latin, despite its many transformations, remained the same (Classical) Latin even in the fifth century A.D. Not until the sixth century did this form of Latin develop a separate pronunciation and syntax from Classical Latin (p. iii-iv). Only in the ninth century did Vulgar Latin become truly distinct from Classical Latin according to these authors. At this point Vulgar Latin became Romance (p. iv).

Earlier, Muller (1929:vii-viii) claimed that Merovingian[108] documents showing new features of Romance, such as the oblique case, the periphrastic future, an analytic passive construction and new word orders, demonstrate the transformation of Latin to Romance. Because classical features are found among these new forms, Muller argues that this shows a transitional period in which features of both the old and new stages are present. In the last part of the eighth century a new language was formed, and all existing classical features were rapidly discarded (p. viii). Muller (p. 5) further believes that the Romance languages did not evolve from the "Koine" Vulgar Latin but derived directly from Classical Latin. He argues that although Vulgar Latin did exist, it was the classical form which was spread throughout the Roman empire and it was Vulgar Latin that was lost in the seventh century after the western empire crumbled. This view differs slightly from the position taken in Muller and Taylor (1932).

More recent accounts maintain this idea of a linear development. Mańczak (1987:182, 187) contends that there is not a piece of concrete evidence to support the split between Classical Latin and Proto-Romance. According to Mańczak (p. 183), one of the main reasons linguists suggested a split between Classical Latin and Proto-Romance was because at the time, they could not conceive of a synthetic language (Classical Latin) becoming analytic (Romance). For instance, the shift from a synthetic passive in Latin using one verb form, e.g., *amātur* 'he is loved', to an analytic passive in Romance that

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[108]Merovingian is defined as 'of or relating to the first Frankish dynasty reigning from about A.D. 500 to A.D. 751' according to Webster's Third New International Dictionary (1966).

uses two verb forms, e.g., It. *(lui) è amato,* was at one time thought to be impossible. Mańczak (p. 184) feels that there is only one real piece of evidence to show that another language was spoken at the same time as Classical Latin, and this is the graffiti evidence from Pompeii (79 A.D.).

(1) a. Classical Latin:

Quisquis amat, valeat, pereat qui nescit amare!
Bis tanto pereat quisquis amare vetat!

b. "vulgar" Latin of Pompeii:

Quisquis ama, valia, peria qui nosci amare!
Bis tanti peria quisquis amare vota!

'Whoever loves, may he thrive; may perish he who does not know how to love; twice over may perish he who forbids to love.' (translation from Pulgram 1978:216)

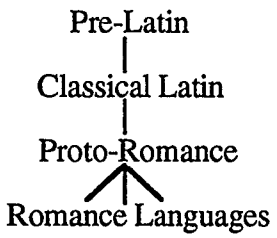
However, Mańczak contends that the Romance languages did not derive from this Pompeiian form. As shown in (1b), the vulgar verb forms have lost the final *-t.* Although most of the Modern Romance verb forms no longer have this *-t,* Romanian *este* and *sînt* still have the original ending, which the author interprets as deriving directly from Classical Latin (p. 185). As well, Modern French still has final *-t* in *plait* 'pleases', cf. Latin *placet,* and Sardinian shows the same ending in *kantat,* Lt. *cantat* 'sings' (p. 185).

While a vulgar form of Latin did exist according to Mańczak (p. 186), it was not a separate, sister language of Classical Latin but was the intermediate stage between Classical Latin and the Romance languages. The doublets that Väänänen (1967) uses as evidence of two coexisting dialects, such as *mesa* = *mensa,* Vulgar Latin on the left and Classical Latin on the right, Mańczak (p. 186) says can be reinterpreted as *mesa* < *mensa.* For this reason he concludes that the Romance languages did not derive separately from Classical Latin but instead derived linearly from Classical Latin with an intermediate stage of Vulgar Latin. Until concrete evidence surfaces to contradict this argument, Mańczak maintains that this is the evolution we must accept as accurate.

These discussions suggest a language tree such as that shown in (2) (based on Hall 1950; Pulgram 1950).[109]

[109]Although the authors in this section generally refer to the intermediate language between Classical Latin and Romance as Vulgar Latin, to remain consistent with the development presented in section 1.2 of this chapter, I use the term Proto-Romance to refer to this stage.

(2)




Having looked at a number of opinions for the direct development of the Romance languages from Classical Latin, let us now examine some opposing views.

### *1.2 Proto-Romance as the sister to Classical Latin*

Pulgram (1950:463) believes that the Romance languages did evolve distinctly from Classical Latin and says that the idea '[t]hat Old Latin is in fact a tongue more akin to contemporary popular speech than the classical language is not a new theory'. Evidence for this split can be found in inscriptions, such as the graffiti at Pompeii, literary texts such as those by Plautus,[110] which Pulgram says represent spoken Latin, and prescriptive rules written by grammarians of the time. According to Pulgram (p. 463; cf. Wright 1982; 1991), written texts which contain vulgar and classical forms, such as the ones Muller (1929) refers to, are examples of written Vulgar Latin which maintained Classical Latin traditions and were used by administrators, the military, and trade merchants as a form of written communication, but were not in fact representative of spoken Vulgar Latin of the time. If true, this would mean that these late written documents of the post-classical era cannot be used to support the idea that Latin remained intact until the eighth or ninth century as has been claimed by Muller (1929) and Muller and Taylor (1932) among others.

In a later paper, Pulgram (1987:191) states that Classical Latin was in fact a literary dialect while Spoken Latin was a diasystem, 'an ensemble of local and social dialects that one may conveniently and justifiably classify under a single name'. The features of this spoken diasystem include a lack of distinction between long and short vowels, a distinction that was previously made in both Old and Classical Latin. Some dialects of Spoken Latin also show a loss of final *-s* and *-m*, for example *tres* > It. *tre* 'three' (cf. Span. *tres*) and *decem* > It. *dieci* 'ten' (Grandgent 1962:126, 129 respectively). It is features such as these that are said to distinguish Spoken Latin from the literary form of the language.

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[110]Around 184 B.C.

Pulgram (1975) states that the reason Vulgar Latin has features in common with Pre-Latin is because Vulgar Latin continued the use of Pre-Latin forms. However, since these features were regarded as substandard, they were not reflected in the classical literature, which accounts for the lack of written attestations of Spoken Latin (Pulgram 1987:190). Pulgram (1950:464) continues by saying that the uniformity of the written style up to the eighth century is due to the continuation of the written, or classical form, but does not indicate a lack of change in the spoken language, contrary to the position held by Muller (1929).

Hall (1950, 1974, 1976, 1983, 1986) argues for a split between Classical Latin and Proto-Romance on the basis of reconstructed phonological and morphological evidence from the Modern Romance languages. He claims (1986:215) that early on there existed two dialects: the spoken and literary form which emerged around the first century B.C. After the expansion of the Roman empire there arose a multidialectal system in which different versions of Proto-Romance were spoken. This is virtually identical to Pulgram's diasystem. As evidence for this separation, Hall (1950:19) shows that in pre-Classical Latin the adjective *cuius* 'whose' was inflected, for example, *cuius, -a, -um,* but in Classical Latin, *cuius* was invariable. However, the Romance languages also use *kuiu, -a* as an inflected adjective. Because the Romance languages carried on the tradition of Old Latin, Hall (p. 19) claims that this evidence shows that Proto-Romance came directly from Old Latin.

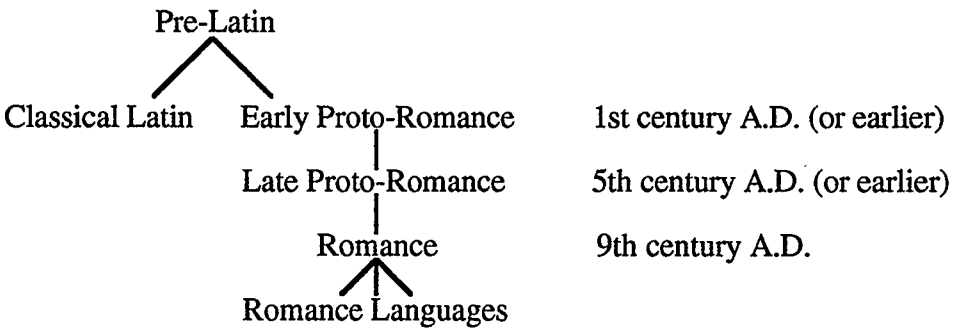
There are also features of Classical Latin which the Romance languages show no trace of, such as the passive voice, the future tense and most non-finite forms (Hall 1983:5). However, in these instances, unlike the previous case of *cuius*, it is easy to argue that these features were merely lost in the Romance languages. Similarly, the fact that spoken Latin did not have a vowel quantity distinction and showed the loss of certain word-final consonants, as discussed by Pulgram (1987), could be attributable to natural language change. However, the identical use of *cuius* in Old Latin and the Romance languages, which differs from its use in Classical Latin, is more indicative of a continuation of Proto-Romance from Old Latin and not Classical Latin.

We have also seen from the Pompeiian graffiti that there is documented evidence to show that two dialects were in simultaneous use. As previously mentioned, Mańczak (1987) contends that the Romance languages cannot derive from this Pompeiian form since certain Romance languages show a retention of word-final *-t* in verbal forms. However, the overreliance on written texts to establish historical facts has its critics. De Dardel

(1987:66) states that some Romanists (e.g., Muller 1929) who rely heavily on Latin texts will drag out an isolated Romance example to compare with a Classical Latin form in order to show that the modern form must have derived from the earlier one. In other words, the fact that Romanian has verbal forms that end in *-t* does not necessarily prove that it derived directly from Classical Latin. De Dardel cautions against relying too heavily on Latin texts to reconstruct the earlier stage of the language. Instead, he believes (p. 68) that a comparison of the spoken dialects along the lines of Hall (1950, etc.) is the best way to reconstruct an earlier form.

It will be noticed that in this chapter I have used the terms "Vulgar Latin" and "Proto-Romance" almost interchangeably. However, this is an undesirable practice. For one reason, the term "vulgar" has taken on various meanings, such as substandard, common, colloquial, etc., and is therefore not descriptively adequate (Hall 1974:9; Pulgram 1975:42; Wright 1982:52). As well, Hall (1950:8) maintains that Vulgar Latin more accurately describes a later stage of Romance, Proto-Italo-Western Romance, and not the original proto-language, which also encompasses Eastern (Balkan) and Southern Romance. Wright (1982:53) has also mentioned that Proto-Romance cannot be equated with Vulgar Latin since there are *vulgus* words which do not exist in the Modern Romance languages. If Vulgar Latin did equal Proto-Romance then we would expect these *vulgus* words to show up in one of the Romance languages. This suggests that a "vulgar" stage existed prior to Proto-Romance. This seems incompatible with Hall's (1950:8) remarks. Below I present a tree which demonstrates the sisterhood between Classical Latin and Proto-Romance and is constructed on the basis of the opinions expressed in this section.[111]

(3)




[111]The dates given in this diagram are based on Wright (1982).

In this diagram, Proto-Romance and Classical Latin appear as sisters. Early Proto-Romance is the stage at which the "vulgus" words Wright (1982) refers to may be found. Between Early and Late Proto-Romance these words were lost, which explains why they do not appear in the Romance languages. Around the time of the ninth century, the Romance languages had become so structurally differentiated as to appear mutually unintelligible. The time of the break up of the Romance languages is based on written documents from Old French, such as the Strasbourg Oaths of 842 A.D., which show a distinctness in the language (Wright 1982:47). This representation is compatible with Wright's (1982; 1991) "one-norm" theory which holds that the Romance languages can be derived from a spoken form of earlier Romance and not a separate, coexisting written version.[112]

### *1.3 Summary*

These last two sections contained statements by various authors who support either a direct development of the Romance languages from Classical Latin or a split between Classical Latin and a spoken form of Latin, variously called Spoken Latin, Common Latin, or Proto-Romance. As we can see, each side draws upon the same type of evidence in order to support its hypotheses leaving us to wonder which proposal is more accurate. I bring to this debate phonological evidence from the reconstruction of Proto-Romance consonant clusters which I believe supports the latter argument; that is, the Romance languages evolved from Proto-Romance which was a sister to Classical Latin.

## 2. Pre-Latin and Classical Latin Syllable Structure

In Classical Latin, an intervocalic consonant cluster consisting of a voiceless stop plus a liquid (*muta cum liquida* ) was regularly tautosyllabified, for instance V$TLV (where T denotes a voiceless stop and L denotes a liquid). Evidence for this syllabification comes from Classical Latin verse in which a short vowel before these clusters was considered light (Lindsay 1894:129-130; Allen 1973:57).[113] This is demonstrated in the following: *tenĕ$brae, pă$tris* and *pŏ$plus* (Allen 1973:137-138). The placement of stress also

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[112]Wright (1982; 1991) argues that a conscious distinction between a classical written form and a spoken form of "Latin" did not exist prior to the Carolingian reforms of the ninth century. Wright maintains that the Romance languages are derived from a spoken form of "Latin" and not the language represented in classical texts as Muller (1929) and others have claimed.

[113]In Latin metre accent placement, *tónitrŭs* is accented like *mónĭtus*, and not like *honēstus* , i.e., the short vowel before the plosive and liquid is considered light (Allen 1973:57).

indicated the syllabification of the word. In Classical Latin a heavy penultimate syllable was stressed, but if it was light then stress fell on the antepenultimate syllable (Grandgent 1962:61).[114] The fact that these stop-liquid clusters could sometimes be heterosyllabic in Classical Latin is shown in the work of classical dramatists where *intégram* is accented on the second syllable (Grandgent 1962:60).

Although a short vowel before a stop-liquid cluster was normally light, that is, the syllable was not closed by a consonant, there exists evidence from Classical Latin that shows that earlier a short vowel followed by this cluster was heavy, that is, the cluster was heterosyllabic. In Classical Latin, short /ĕ/ in an open syllable normally became short /ĭ/. For example, Pre-Latin +infĕ$cit > CL infĭ$cit (Allen 1973:137-138; cf. Timpanaro 1965:1084). In a closed syllable there was no change: Pre-Latin +infĕc$ta > CL infĕc$ta (Allen:138). This is the same development we see in Classical Latin *integrum* (not **intigrum* ), *obsecro* (not **obsicro* ), *perpetro*, *peregre* and *genetrix* (Timpanaro 1965:1084). The lack of a vowel change in these words suggests that the consonant-liquid clusters were in fact originally heterosyllabic.[115] A summary of these changes is shown in (4).

(4) a. Pre-Latin ĕ$ > Classical Latin ĭ$
Pre-Lt. +infĕ$cit > CL infĭ$cit

b.

| | | | |
|---|---|---|---|
| Pre-Latin: | intĕg$ra | infĕ$cit | infĕc$ta |
| ĕ$ > ĭ$: | ---------- | infĭ$cit | ---------- |
| Tautosyllabification: | intĕ$gra | --------- | ---------- |
| Classical Latin: | intĕgra | infĭcit | infĕcta |

c. Pre-Latin VT$LV > Classical Latin V$TLV

As illustrated in (4), the original syllabification of VT$LV in Pre-Latin became V$TLV in Classical Latin. This explains the syllabification of V$TLV in Classical Latin and accounts for the antepenultimate stress in *intĕgra.* Recalling our possible syllable contact changes, we can posit that the change from VT$LV in Pre-Latin to V$TLV in Classical Latin was the result of a poor syllable contact. Since a syllable contact consisting of a strong coda followed by a weaker onset is not preferred, tautosyllabification was a means of improving the syllable contact in Classical Latin.

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[114]The penultimate syllable is the one second from the end from right to left, and the antepenultimate syllable is the third from the end, also from right to left.

[115]See also Väänänen (1963:34) who draws similar conclusions.

I have argued throughout this thesis that intervocalic consonant clusters in Proto-Romance were heterosyllabic. If Classical Latin tautosyllabified these clusters, how then are we to derive the heterosyllabic clusters of Proto-Romance from Classical Latin? I would argue that we would not. Instead, I suggest that the heterosyllabic clusters reconstructed for Proto-Romance were inherited directly from Pre-Latin.

In words like *intĕgrum, tenĕbra* and *colŭbra,* stress fell on the antepenultimate syllable in Classical Latin in accordance with the Classical Latin stress rule. In the Romance languages, however, stress is on the penultimate syllable, as in Italian *entéro* 'whole', *tenébra* 'darkness' and *colúbro* 'snake'. Grandgent (1962:61) has suggested that Pre-Latin had heterosyllabic consonant clusters, as indicated in (4b) which would mean that stress would have also fallen on the heavy penultimate syllable if we accept that the Classical Latin stress rule was in fact inherited from Pre-Latin as suggested by Timpanaro (1965:1090). Given that the Modern Romance languages show penultimate stress in these words, it is likely that Proto-Romance also demonstrated this same penultimate stress. In fact it must have if the consonant clusters were indeed heterosyllabic.

The suggestion that Proto-Romance shared both the stress pattern and syllabification of Pre-Latin and not Classical Latin implies that Proto-Romance was conservative in maintaining the features derived directly from Pre-Latin. Although the same features of Pre-Latin were passed on to Classical Latin, this dialect was innovative in altering the nonpreferred syllable structure. It is easy to motivate the change in syllable structure in Classical Latin within the Preference Law theory: tautosyllabification was a syllable contact improvement. The shift from hetero- to tautosyllabic consonant clusters in Classical Latin then affected the stress pattern of words like *intĕgrum.* Once tautosyllabification took place in Classical Latin in order to improve the syllable contact, the penultimate syllable became light. According to the Classical Latin stress rule, a stressed light penultimate syllable was not allowed. Therefore, in accordance with the stress rule, stress shifted to the antepenultimate syllable. This is indicated in (5).

(5)

| | Classical Latin | Proto-Romance |
|---|---|---|
| Pre-Latin: | intĕ́g$ra | intĕ́g$ra |
| Tautosyllabification: | intĕ́$gra | ---------- |
| Stress shift: | íntĕ$gra | ---------- |
| | íntĕgra | intĕ́gra |

It should be clear from this diagram that no change in syllable boundary or stress shift is required for the development of Proto-Romance if we accept the direct development of Proto-Romance from Pre-Latin. As well, the changes in Classical Latin are easily accounted for within this proposal. This approach provides support for the split between Classical Latin and Proto-Romance as presented in section 1.2 of this chapter. Alternately, if we take the view presented in section 1.1, where a direct development of Proto-Romance from Classical Latin was argued for, we are presented with difficulties.

Elcock (1960:39-42), who assumes that the Romance languages developed linearly from Classical Latin, states that the shift from proparoxytonic (antepenultimate) stress in Classical Latin to paroxytonic (penultimate) stress in the Romance languages was reflective of a general trend towards paroxytonic stress. This penultimate stress was often attained through a shift of stress or vowel syncope. Elcock includes words such as *intĕgrum* among those in which there was a shift from proparoxytonic stress in Classical Latin to paroxytonic stress in Proto-Romance (p. 40). If we assume that Proto-Romance came directly from Classical Latin, then the shift in stress from antepenultimate to penultimate may not be attributable to a change in syllable structure since this appears to be a general language trend. However, one problem still remains: why did heterosyllabic consonant clusters in Pre-Latin become tautosyllabic in Classical Latin only to become heterosyllabic once more in Proto-Romance? That is, what motivated the change from Classical Latin V$CCV to Proto-Romance VC$CV?

As is the case in the Modern Romance languages, Classical Latin favoured syllables ending in a vowel (Grandgent 1962:60) in accordance with Coda Law (a). Therefore, a shift from V$CCV to VC$CV in Proto-Romance would create a less natural syllable structure. As well, the shift from V$CCV to VC$CV, where the first consonant is stronger than the following consonant, would also create a worse syllable contact according to the Syllable Contact Law. Thus within the Preference Law theory it would be difficult to motivate the change from V$CCV to VC$CV as would be required if we were to derive Proto-Romance from Classical Latin.

A logical alternative would be to posit that Classical Latin was innovative in shifting the syllable boundary from Pre-Latin VC$CV to V$CCV in order to improve the syllable contact, but Proto-Romance was conservative in maintaining the Pre-Latin syllable structure. As we have seen, VC$CV in Proto-Romance subsequently underwent various phonological changes, such as those discussed in chapter two, also to improve the syllable structure. The two possible developments of Proto-Romance are shown below.

(6) a. Proto-Romance as the daughter of Classical Latin:

| | | |
|---|---|---|
| Pre-Latin | intĕ́g$ra | |
| \| | | |
| Classical Latin | intĕ́g$ra | Tautosyllabification-Syllable contact improvement |
| \| | íntĕ$gra | Stress shift-Classical Latin stress rule |
| Proto-Romance | íntĕg$ra | Heterosyllabification-No motivation |
| \| | intĕ́g$ra | Stress shift-Classical Latin stress rule |
| Romance | It. intéro | |

b. Proto-Romance as the sister to Classical Latin:

| | | |
|---|---|---|
| Pre-Latin | | |
| intĕ́g$ra | | |
| CL | PR | |
| intĕ́g$ra | intĕ́g$ra | |
| intĕ́$gra | ---------- | Tautosyllabification-Syllable contact improvement |
| íntĕ$gra | ---------- | Stress shift-Classical Latin stress rule |
| íntĕ$gra | intĕ́g$ra | |
| | \| | |
| ↓ | Romance | |
| ∅ | It. intéro | |

In (6a), Pre-Latin starts with a heterosyllabic plosive and liquid cluster and penultimate stress. The cluster becomes tautosyllabic in Classical Latin in order to improve the syllable contact. Consequently, there is a stress shift to the antepenultimate syllable in accordance with the Classical Latin stress rule. Deriving Proto-Romance from Classical Latin requires a return to the original heterosyllabic syllabification, assuming the reconstruction of heterosyllabic consonant clusters in Proto-Romance that I have proposed to be correct. As mentioned, there is little to motivate this resyllabification.

In (6b), there is a dialectal split shown between Classical Latin and Proto-Romance. Classical Latin undergoes tautosyllabification of word-internal clusters as a syllable contact improvement. Then stress shifts to the antepenultimate syllable following the Classical Latin stress rule. Ultimately, this form of Latin ceases to be used. In Proto-Romance there is no tautosyllabification, therefore, no stress shift is required. In the Romance languages various syllable structure changes occurred which improved the nonpreferred contact. (6b) illustrates the more motivated course of developments and also supports independent arguments for the split between Classical Latin and Proto-Romance. It also shows that

Proto-Romance was conservative in maintaining the original syllable structure while Classical Latin was innovative, the contrary to what is normally assumed.

It may seem like a large leap to assume that Classical Latin and Proto-Romance are sisters on the basis of a difference in syllabification. However, if we accept that Pre-Latin and Proto-Romance had the same heterosyllabic syllable structure, the proposed split provides a logical explanation for the syllable structure differences between Classical Latin and Proto-Romance. As well, this proposal provides additional support for independent claims made regarding the separate evolution of Classical Latin and Proto-Romance.

## 3. Summary

In this chapter I have presented two arguments pertaining to the development of Proto-Romance. Based on the reconstruction of Proto-Romance syllable structure that I have proposed, as well as independent evidence showing the prosodic differences between Pre-Latin and Classical Latin, I found it necessary to derive the ancestor of the Romance languages directly from Pre-Latin and not Classical Latin. The linear derivation of Proto-Romance from Pre-Latin requires no resyllabification of the word-internal consonant clusters. However, if Proto-Romance is derived directly from Classical Latin, then proponents of this position must motivate the shift from tautosyllabic consonant clusters of Classical Latin to heterosyllabic clusters in Proto-Romance.

### *3.1 Discussion*

In chapter two I made claims regarding the tautosyllabification of VC$rV clusters in some of the Romance languages we have discussed. It was evident from changes this cluster underwent that it must have been tautosyllabic at one time. For example, the vowel change seen in Fre. *pȩ̀re* 'father', Lt. *pa̱tre*, occurred in an open syllable, which indicates that the plosive-liquid cluster must have been tautosyllabic. Why then should we believe that this cluster was ever heterosyllabic in Proto-Romance?

First, implicational evidence from other syllable structure changes require us to reconstruct VCrV as heterosyllabic. For instance, we have seen convincing evidence to suggest that VC̱iV was once heterosyllabic. In Italian, we saw gemination of the consonant before yod as well as glide strengthening in syllable-initial position. In French, coda weakening, glide strengthening and gemination also occurred in these types of clusters, and there were similar changes in the other languages we discussed. As well, we saw these

same types of changes affecting plosive + /l/ clusters. The Synchronic Maxim states that on a given parameter, a language system will not contain less preferred stuctures unless it also contains more preferred structures. This implies that if the less preferred structure VC$i̯V existed in Proto-Romance then the more preferred structure VC$rV must have also been present. According to the Diachronic Maxim, language change begins with the least preferred structures. From the Syllable Contact Law we know that of the three contacts just mentioned, VC$i̯V is the least preferred if a consonantally stronger segment immediately precedes the syllable-initial glide. VC$rV is more preferred than VC$i̯V but less preferred than VC$lV. This means that if a syllable structure improvement is going to occur, it will begin with VC$i̯V, followed by VC$rV and VC$lV will be the last to be improved. Therefore, theory internal evidence requires us to reconstruct VC$rV along with VC$i̯V and VC$lV based on the fact that syllable contact changes affected both VC$i̯V and VC$lV.

Second, there is some evidence from the languages we have examined which lends support to the reconstruction of VC$rV in Proto-Romance. In Italian, certain segments geminated before /r/, for example, Lt. *fĕbrŭārĭus*, It. *febbraio* 'February'. Recall that gemination is one possible way to improve a poor syllable contact of a strong coda followed by a weaker onset. This development patterns with that of VC$lV and VC$i̯V (see sections 1.1 in chapter two and 2.2 in chapter four for the developments of VC$lV and VC$i̯V, respectively, in Italian). Therefore, it seems more natural to assume that the cluster VC$rV was involved in the same syllable structure improvement process as these other two clusters rather than to claim that V$CrV was undergoing gemination for independent, unexplained reasons.

Finally, it has been argued that certain vocalic developments that occurred in open syllables, especially diphthongization, irrefutably show that clusters of VCrV were tautosyllabic. For example, Morin (p.c.) has indicated that at some point during the evolution of Old French *veirre* (*voirre* ) 'glass', Latin *vetrum*, the plosive and liquid must have been in the same syllable. This explains the diphthong [ei] ([oi]) which developed from tonic /e/ in an open syllable (Pope 1952:105). Morin posits the following development: [ve$tro] > [vei̯$tro] > [vei̯$dro] >[vei̯$ðrə] > [vei̯ð$rə] > [vei̯r$rə] > OFre. *veirre/voirre.*

Although open syllable diphthongization has occurred quite regularly in many of the Romance languages, Dauzat (1950:36) considers this diphthongization to have occurred independently in each of the Romance areas affected. That diphthongization was not a pan-

Romance development is indicated by the fact that certain areas, such as southern France, Portugal, Sardinia, and Romania, do not demonstrate the same vocalic changes (Dauzat:36; cf. Straka 1956:253). What this indicates is that diphthongization before the cluster /-Cr-/ may have been a relatively late, language-specific event.

In chapter two, I argued that the reason we do not see many syllable structure changes involving VCrV is due to the tautosyllabification of the plosive which remedied the poor syllable contact. The French example above indicates that a plosive + /r/ was tautosyllabic. However, I would suggest that this cluster was originally heterosyllabic, like VClV and VC̣iV, and became tautosyllabic in order to improve the syllable contact. Tautosyllabification of VC$rV cannot have occurred in Proto-Romance, as it apparently did in Classical Latin, otherwise we would not expect gemination before /r/ such as we see in Italian. Nor would be expect weakening of velars before /r/ in French, as in Lt. *lacryma*, OFre. [lairmə] 'tear'. Thus this tautosyllabification cannot be a pan-Romance event. The language-specific tautosyllabification of VC$rV may explain the open syllable diphthongization evidenced in French and other Romance languages and the lack of such a change in several of the other Romance languages.

We have seen that a poor syllable contact may undergo various changes in order to improve the structure. The changes that affected an intervocalic consonant + yod and an intervocalic consonant + /l/ were quite similar: metathesis, gemination, coda weakening, etc. The change which most commonly affected VC$rV was tautosyllabification. Although these clusters sometimes underwent similar developments and other times sustained different changes, the ultimate effect was an improvement in the syllable structure in ways predicted by the Preference Laws.

## Chapter Six

## CONCLUSION

All through this work I have claimed that intervocalic consonant clusters in Proto-Romance were originally heterosyllabic. On the basis of the Preference Law theory (Vennemann 1988), we can predict ways in which syllable structure will change in order to improve various parts of the syllable, such as the head, contact and coda. Knowing how syllable structure can be altered over time allows us to reconstruct a previous state of the language on the basis of sound changes that have occurred. Reconstructing heterosyllabic consonant clusters in Proto-Romance allows us to make a general statement regarding seemingly unrelated sound changes across the Romance languages. Phonological changes examined in several Romance languages, such as coda weakening, gemination, glide strengthening, and more can be equally explained as syllable contact changes once we establish VC$CV as the original syllable structure of intervocalic consonant clusters in Proto-Romance.

The reconstruction I presented is based on the principles of the Preference Law theory (Vennemann 1988). The laws of this theory make universal statements about the preference of one type of syllable over another by reflecting the markedness of certain syllable structures observed in language acquisition, language change and language typology. An important feature of this theory is the assignment of consonantal strength to sounds. By assigning phonological segments strength values, we are better able to compare the preference of one structure over another, which aids in predicting how syllable structure will change over time. The most important law with regards to the present work is the Syllable Contact Law which predicts that a less preferred syllable contact will become more preferred. There are a variety of ways in which a less preferred syllable contact can be improved. For instance, when a consonantally stronger coda precedes a weaker onset a way to improve the contact is through gemination, coda weakening, or tautosyllabification. We have seen all of these changes and more in our examination of the Romance languages.

In chapter two I examined phonological changes in Italian, Portuguese, Catalan, French, Romanian and Spanish. I showed that a number of sound changes, such as gemination, coda weakening, tautosyllabification, metathesis and head strengthening, can be generally accounted for as syllable contact changes when we reconstruct heterosyllabic consonant clusters for Proto-Romance, the predecessor of the Romance languages. The traditional account states that clusters such as VCiV, VCrV and VClV were originally

tautosyllabic. However, this view provides no nonarbitrary explanation for the related sound changes witnessed across the Romance languages. A more economical solution is found for the similarity of sound changes in the reconstruction of VC$CV for Proto-Romance.

Two alternate analyses of syllabification were presented in chapter three. Clements (1990) and Rice (1992) both examined syllabification within a Feature Geometry framework (Clements 1985). While the Preference Law theory utilizes consonant strength to aid in determining syllabification, these two analyses use the sonority of a segment to establish how a consonant cluster should be divided. Although the principles of both of these analyses reflected similar observations made in the Preference Laws, I found that the sonority scales used in these two pieces of work were not articulated enough to capture the phonological changes observed in the Romance languages. We have seen that a strength distinction must be made between stops and fricatives, for example, in order to explain why a stop historically weakens to a fricative. This type of weakening is relevant to syllabification but cannot be captured by the sonority scales given in either analysis.

Palatalization was examined in chapter four. I tried to show that certain sound changes in French and Italian have at times been incorrectly labelled as "palatalizations" because they result in the same type of segments as those produced by "true" palatalization. We saw that glide strengthening syllable-initially was a means of improving a poor syllable contact in French. The weakening of certain syllable-final stops to a palatal glide was another way of improving a syllable contact in French and was not the result of assimilation, as is the case for true palatalization such as that demonstrated when a velar stop is fronted before a front vowel. In Italian, we saw that identical consonant clusters can undergo different types of "palatalization". While it has been previously maintained (Salverda de Grave 1930) that these separate developments are due to a difference in syllabification, I claimed that on the basis of a single syllable structure, VC$CV, we can explain the divergent developments of consonant + yod sequences. One set of examples showed gemination while the other indicated that glide strengthening had taken place. Both of these are effective ways of improving a poor syllable contact. Romanian showed that different reflexes of palatalization can be used to indicate a previous state of the language. Here we saw that palatalization supported the reconstruction of VC$CV in Proto-Romance.

In the last part of chapter four I presented two accounts of "palatalization". Again, both of these accounts were based in the Feature Geometry framework. While Lahiri and Evers (1991) and Hume (1992) differed in their accounts of Palatalization, both sides

agreed that Coronalization was achieved through the spreading of the feature [coronal] from a front vocoid. There were two reasons that I presented these accounts. The first was to show that palatalization is an assimilatory change and is different from the syllable structure changes evidenced in French and Italian. Second, I wanted to show that current theories of palatalization still do not predict the outcome of palatalization. For instance, in Early French we saw that a voiceless velar became a [+anterior] affricate before a front vowel while its voiced counterpart became a [-anterior] affricate. In a later stage of the language, both velars changed into [-anterior] affricates before the fronted vowel /a/. I tried to show that on the basis of markedness, we can predict that if a coronal affricate is produced it will be [-anterior]. It was argued that the creation of a [±anterior] affricate was due to the ordering of a redundancy rule in the derivation of the palatalized segment. Furthermore, I suggested that the shift from the creation of a [+anterior] affricate in pre-Old French to the creation of a [-anterior] affricate in Gallo-Roman was a shift from a marked to an unmarked phonological system. More work needs to be done to see if this assessment holds across the Romance languages, or perhaps cross-linguistically.

Finally, I examined the implications the reconstruction of heterosyllabic consonant clusters in Proto-Romance have for the evolution of the Romance languages. While there is one side that believes that the Romance languages derived directly from Classical Latin, either with or without an intermediate stage of Vulgar Latin, there is another side that argues that Classical Latin and the predecessor of the Romance languages, which I have been calling Proto-Romance, evolved separately. Because both sides of the debate pull out the same evidence to support their side of the argument, it is difficult to ascertain which theory is more plausible. I showed on the basis of prosodic differences between Classical Latin and Proto-Romance, that Proto-Romance must have evolved directly from Pre-Latin with which it shares the common feature of syllable structure. The reconstruction I have argued for provides new support for the split between Classical Latin and Proto-Romance.

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