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THE PREFERENTIALITY OF LINGUISTIC CHANGE

A THEORETICAL ANALYSIS OF THE DEVELOPMENT OF STRESSED VOWELS
IN SUBSILVAN (RAETOROMANSH)

by

Martin Andreas Wyss

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
in the Department
of
Languages, Literatures and Linguistics



Martin Andreas Wyss 1983

SIMON FRASER UNIVERSITY

June 1983

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APPROVAL

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The Preferentiality of Linguistic Change

A Theoretical Analysis of the Development of Stressed

Vowels in Sursilvan (Raetoromansh)

Author:

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July 18, 1983

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Abstract

This thesis investigates phonological processes in the development of stressed Latin vowels in Sursilvar, a Raetoromansh language. Analyses and solutions are presented within the framework of Theoretical Phonology, the linguistic theory introduced in the work of Professor James Foley. In Theoretical Phonology, linguistic change is explained with a small number of phonological processes conditioned by universal principles. One of these principles is the Inertial Development Principle (IDP) which predicts that phonological change occurs preferentially. There are two theoretical themes recurring throughout this thesis. According to the IDP, phonological processes are governed by universal conditions. These conditions are isolated by comparing and subsuming language specific conditions under which phonological processes may appear. All of the investigated phonological rules are found to apply preferentially. They either apply to specific elements, or their application is conditioned by specific elements rather than by entire classes of elements. The preferentiality of linguistic change is interpreted with reference to the strength relations among the phonological elements.

Chapter one introduces the Sursilvan language and the theoretical concepts, such as the preferentiality of linguistic change, used in this thesis. Chapter two examines the prenasal changes of stressed vowels with reference to phonological interactions between vowels and following nasals. Different

prenasal reflexes are interpreted as a result of two contrary phonological processes: diphthongization and contraction, which are found to be manifestations of more abstract phonological processes, revealing the preferentiality of linguistic change. Chapter three investigates the development of open mid vowels. The Romance diphthongization is analyzed as a process governed by one uniform condition. Since this condition is not met by the change of 'E' to 'ia', it is interpreted as a pseudodiphthongization resulting from the addition of a metathesized schwa generated between two consonants.

The philological analysis of the diphthongization of open mid vowels in Sursilvan (metaphony), is shown to be inadequate and rejected in favour of a more abstract solution :
the polarization of phonological strength.

From the interpretation of stressed vowels in Sursilvan, it is concluded that linguistic change can be explained with reference to a limited set of universal processes, and that linguistic change is governed by the preferential application of these processes, as predicted by the IDP.

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I. Introduction

The purpose of this chapter is to introduce the Sursilvan language¹ in its Raetoromansh context, and to give a brief presentation of the theoretical framework within which the data will be analyzed.

In section 1.1, the distribution of Raetoromansh will be illustrated, and some characteristics of its phonology will be compared to French and Italian. It will be shown that Sursilvan has been chosen as a representative language, because it is the most archaic of the different Raetoromansh varieties.

In section 1.2, it is shown that linguistic change can be explained systemically (i.e. without reference to nonlinguistic factors), once it is acknowledged that it occurs naturally and that it is governed by universal principles.

In Theoretical Phonology it is claimed that linguistic change neither occurs randomly nor idiosyncratically, but preferentially: phonological rules apply to specific elements in preference to other elements. As an illustration for this claim, the rule that deleted all final vowels in French (apocope), is shown to be the result of a gradual process which applied in a predictable direction.

¹ For data, data sources and phonetic symbolism cf. appendix.

1.1 Raetoromansh and Sursilvan

Raetoromansh is a cover term for a variety of Romance languages spoken in the area between the origin of the Rhine in the west, and the bay of Trieste in the east. Restricted to marginal, largely rural areas of three different countries (Switzerland, Austria and Italy), the Raetoromansh dialects never developed a standardized language unlike other Romance languages such as French, Italian and Spanish which emerged from economically powerful dialects into national languages.

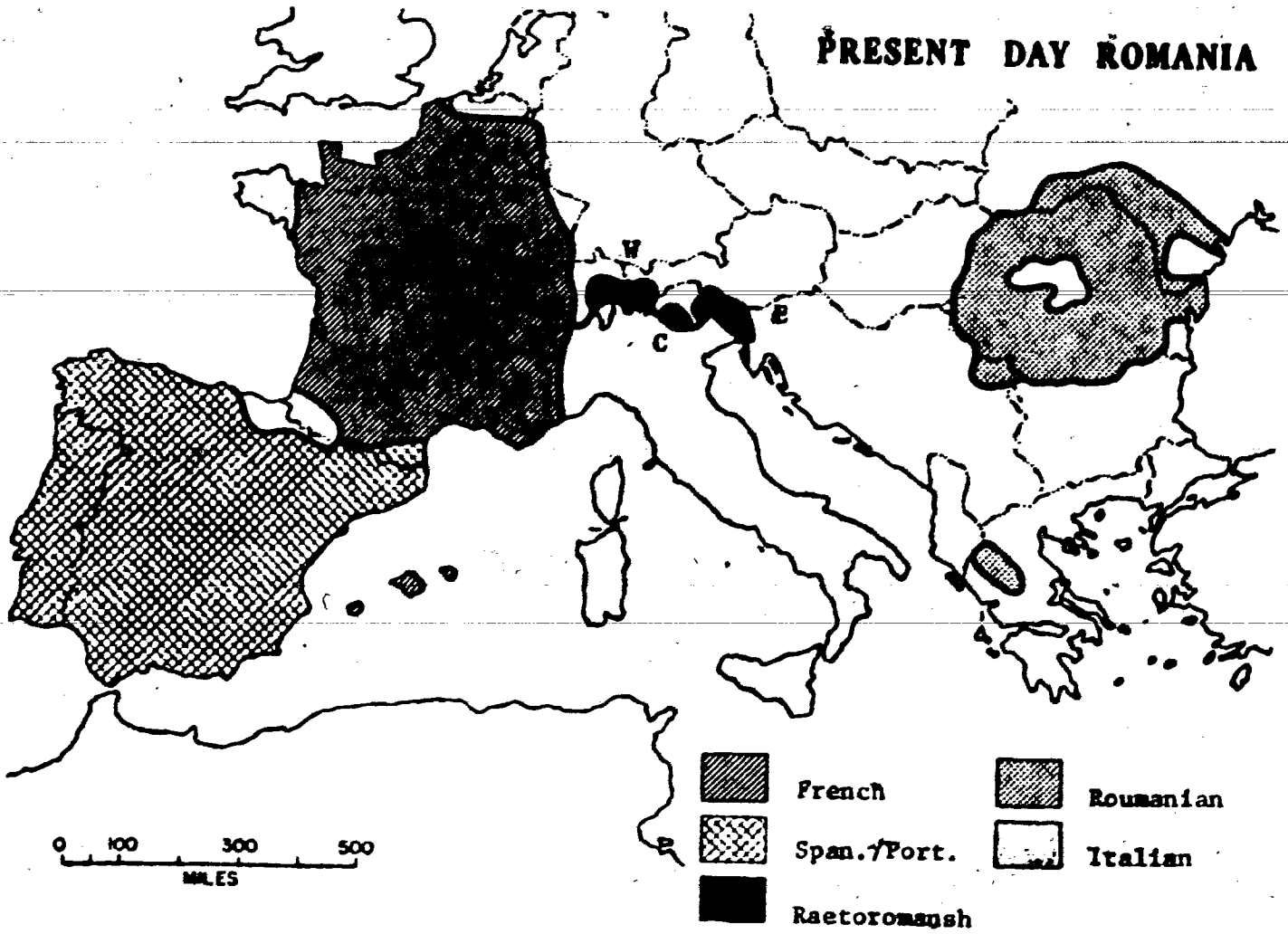
But despite its variety, dialectologists such as Ascoli ("Saggi Ladini", 1873) and Gartner ("Raetoromanische Grammatik", 1883) recognized the linguistic unity of the Raetoromansh dialects which they divided in three major groups: East Ladin or Friulian, Central Ladin or Dolomitan and West Ladin or Romansh which is spoken in the Swiss Canton of Graubunden. This view has been emphasized by Decurtins. ²

Ascoli e Gartner han cumprovau cun ina retscherca e documentaziun solida ch'il romontsch, il ladin central (dolomitan) ed il furlan han in funs linguistic comunabel, e dil pugn da vesta scientific ina unitad.

² Decurtins, 1964, p. 30

The location of West (W), Central (C) and East (E) Ladin is shown on the map below.²

FIGURE 1

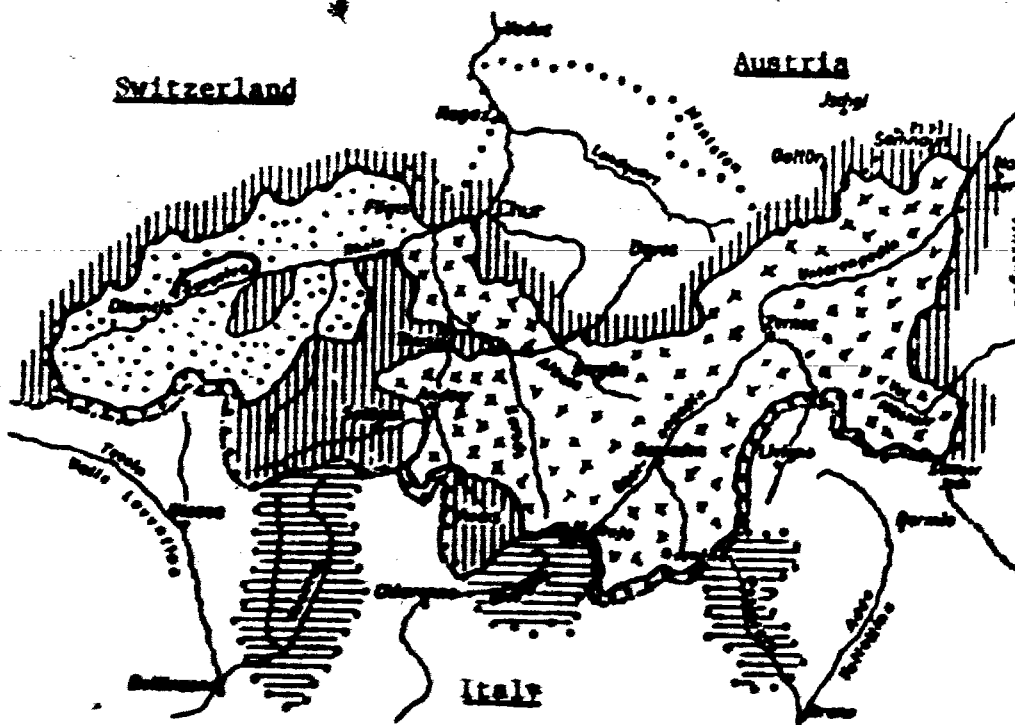




² Adapted from Mendeloff, 1969, p. X

While East and Central Ladin have been heavily influenced by neighbouring North Italian languages such as Venetian and Lombardian, the West Ladin dialects remained comparatively unaffected. Sursilvan, the most western of the West Ladin dialects, due to its geographical isolation (cf. map² below), is considered today to be the most archaic Raetoromansh variety; this is the reason it has been chosen as the representative for the Raetoromansh languages in this thesis.

FIGURE 2 LINGUISTIC BOUNDARIES

Alle sind sich darüber einig, dass das Surselvische die ausgeprägteste und archaischste Phase des Raetoromanischen festhält.³



Italian 
 German 

Sursilvan 
 Other Raetoromansh 

² Adapted from Rohlfs, 1975, p. XIV

³ Prader-Schucany, p. 18

The Raetoromansh languages possess, according to Rohlfs (1975, p. 7), many rules which can be found in a further developed form in French. Some of these rules are outlined in the following pages, by comparing Sursilvan data to Italian and French data.

1. Assibilation before a:

In Raetoromansh, the general assibilation of k before a is restricted to certain words: capra > tga³ (French: chèvre), but cara > cara (French: chère). The retention of the occlusive onset is another sign that assibilation has not developed as far as it did in French: [tsavr³] but [sevr³].

Italian:	Sursilvan:	French:
capra	tga ³	chèvre
carbone	carbun	charbon

2. Vocalization of l:

In syllable final position l vocalizes to u in French: Italian alto, French haut (Old French [awt], Modern French [o]). The intermediate stage /aw/ is found in Sursilvan: ault.

³ Orthographic tg = [tS]

3. Apocope:

All Romance final vowels have been lost in French, whereas final a has been retained in Sursilvan:

Italian:	Sursilvan:	French:
pane	paun	pain
mano	maun	main
lana	launa	laine

4. Nasalization:

Although there are no nasalized vowels in Sursilvan, vowels diphthongized under the influence of a following nasal (cf. Chap. 2): Italian mano, Sursilvan maun, French main [m[̃]ɛ].

5. Diphthongization of e:

The Old French reflex ei for e is still present in Sursilvan: Italian tela, Sursilvan teila, French toile.

6. Intervocalic Lenition:

In French, voiceless dental occlusives were lost intervocalically. In Sursilvan, as in Spanish, they only lenited to voiced stops: Italian rota, Sursilvan roda, French roue.

1.2 Linguistic Change in Theoretical Phonology

Philologists have attempted to explain linguistic change with reference to nonlinguistic factors such as the laziness of the speaker, which is said to involve two antipodal tendencies:

1. Improper enunciation of speech sounds or ease of articulation, and
2. the speaker's desire to maintain the distinctiveness of the linguistic sign (phoneme), or ease of perception.

A typical formulation of this still pervasive view⁴ can be found in Gartner:⁵

Ease of Articulation:

Wenn ein Volk einen Laut seiner Sprache im Laufe der Jahrhunderte veraendert oder abwirft, so thut es dies meistens um Kraft und Zeit zu ersparen, also zur Bequemlichkeit des Sprechenden.

Ease of Perception:

Manchmal ist der neue Laut nicht bequemer auszusprechen, aber er ist deutlicher: er dient also zunaechst der Bequemlichkeit des Angesprochenen, aber auch wieder der des Sprechenden, in so fern sich dieser leichter verstaendlich macht.

⁴ Falk (144:1978) lists four extrasystemic factors responsible for sound change: "(1) physiological characteristics of the speech and hearing systems of man, (2) language contact, (3) the social nature of language, and (4) the acquisition of language by children", but fails to mention the systemic nature of phonological change.

⁵ Gartner, 1910, p.33

The laziness of the speaker has therefore been said to be the cause for the loss of final Latin vowels in many Romance languages. This idea, however, does not account for the preferential loss of final vowels:

In Spanish, for instance, apocope applied to e but not to o or a.

mare

mar

octo

ocho

amica

amiga

In Theoretical Phonology, on the other hand, linguistic change is regarded as natural. The questions that are asked are therefore not why and for what purpose language changes, but how (why was e but not o or a lost in Spanish ?) and in which direction the changes take place; in other words, what is the nature of linguistic change ?

If language change were regarded as natural, linguists would not feel compelled to explain it, and could instead devote their energies to discovering the nature of language change.⁶

⁶ Foley, 1981, p. 13

Linguistic change is not only regarded as natural, but as governed by universal laws and principles such as the Inertial Development Principle (IDP), which states that⁷ :

- (1) strong elements strengthen first and most extensively and preferentially in strong environments,
- and (2) weak elements weaken first and most extensively and preferentially in weak environments.

The strength of phonological elements that is referred to is, unlike the phonetic (acustico-articulatory) features, an abstract property which is revealed by the behaviour of the phonological elements, that is, in their participation or nonparticipation in phonological rules.

Configurations such as the one obtained for apocope in Spanish, reveal specific relations among the phonological elements. On the basis of the assumption that the loss of final e must be a weakening process (nothing is weaker than something, i.e. $0 < 1$), it can be concluded that e must be weaker than o and a,

thus: $e < o, a$

⁷ Foley, 1977, p.107

In Sursilvan, on the other hand, only final a is retained, indicating that a must be the strongest vowel.

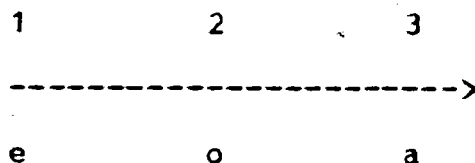
mare	mar
octo	otg
amica	amitga

thus:  e , o < a

Combining the Spanish and the Sursilvan situations, the following relations among the three vowels can be found:

e < o < a

If these phonological elements are assigned numerical values representing their inherent strength,



the phonological process apocope can be analyzed and formulated in the following way:

Italian	mar-e	ott-o	amic-a	0 -> Ø
Spanish	mar-	och-o	amig-a	1 -> Ø
Sursilvan	mar-	otg-	amitg-a	1,2 -> Ø
French	mer-	huit-	ami-e ⁸	1,2,3 -> Ø

The universal rule for apocope is therefore conditioned by the inherent phonological strength of the vowels:

Universal Rule (Apocope) : $V \rightarrow \emptyset (_ \#)^9$

Universal Condition : $|V| < n$

Parochial Conditions : $n = 0$ for Italian

$n = 1$ for Spanish

$n = 2$ for Sursilvan

$n = 3$ for French

⁸ Final e is not pronounced in French

⁹ Phonological environments are contained in brackets

The general application of apocope in French must be the result of a gradual development which first deleted e (as in Spanish), later o (as in Sursilvan), and finally a as in French. Although there can be no reason why apocope completely failed in Italian, in Theoretical Phonology it is possible to give a principled (weak elements weaken first) and systemic explanation for the preferential loss of final e in Spanish, and the preferential retention of final a in Sursilvan:

1. e ($|V| = 1$) $\rightarrow \emptyset$
2. o ($|V| = 2$) $\rightarrow \emptyset$
3. a ($|V| = 3$) $\rightarrow \emptyset$

The strength differences that exist between the phonological elements, their environments and their positions, create intrasystemic instabilities which may manifest themselves as phonological rules.

Since all phonological elements differ in their inherent strengths, phonological rules typically apply to specific elements rather than to whole classes of elements.

If on the other hand our rules had been based on phonetic properties, we would be merely rewriting the data:

e (mid front)	->	ø, (mar)
o (mid back)	->	iden (ocho)
a (low back)	->	iden (amiga)

Summary

In this chapter, Sursilvan has been introduced as a representative Raetoromansh language which shares a number of phonological rules with French.

In section 1.2, the conception of linguistic change in Theoretical Phonology has been introduced, and illustrated with a comparison of the preferential application of apocope in Italian, Spanish, Sursilvan and French.

II. The Development of Stressed Vowels before Nasals

In Sursilvan, as in most other Romance languages, Latin vowels have different reflexes before nasal and oral consonants. This simple observation has been listed by philologists again and again¹, but it never has been investigated deeply enough to allow for a phonological evaluation of the phonetic facts.

In section 2.1, the development of prenasal a is investigated. The diphthongization of a to au is interpreted as a result of prenasal strengthening and related to similar processes in other Romance languages. The contraction of au to o, is found to be the result of a strengthening process, occurring preferentially in sufficiently strong nasal environments.

In section 2.2, the consequences of the findings made in 2.1 will be examined with respect to the systematic difference of all Sursilvan vowels before dental and labial nasals. The lowering of high vowels before n will be related to the contraction of au to o in strong nasal environments.

¹Cf. Ascoli 1873, Huonder 1901, Gartner 1910, Caduff 1952, Bourciez 1967, Prader-Schucany 1970 etc.

2.1 Diphthongization and Contraction of Prenasal a

Before oral consonants, stressed a stays the same in Sursilvan:

ala	ala
clave	clav
platta	platta

but before nasal consonants, a diphthongizes to au,

manu	maun
plana	plauna

or raises to o:

annu	onn
planta	plonta

The situation can be summarized with the following rules:

Open Syllables:

a -> a (_ % oral C)	ala
a -> au (_ % n)	plauna

Closed Syllables:

a -> a (_ oral C %) platta

a -> o (_ n %) plonta

Although these rules generate the correct phonetic output, which may make them useful for descriptive purposes, they are of no theoretical significance for they fail to indicate the relations and processes behind the phonetic changes.

Since Theoretical Phonology is concerned with the nature of linguistic change rather than with its description, the pertinent phonological processes are isolated in contrastive configurations of the form: - e

A -> idem (X)

A -> E (Y_)

In most Romance languages Latin au monophthongized to o², and in Norman French prenasal a diphthongized to au : branca -> braunche, pronounced /brOS/ (cf. p.23).

Given this independent evidence, the conversion of prenasal a to o is interpreted as a two step process:

1. a -> au

2. au -> o

² N.B. Latin o never changes to au.

The data can now be analyzed on the basis of two contrastive configurations which reveal relations and elicit questions which could not have been asked on the basis of the rules given above.

1. a -> idem (_ oral C)
 a -> au (_ nasal C)

Why does a diphthongize before nasal, but not before oral consonants ?

2. au -> idem (_ % n)
 au -> o (_ n %)

Why does au contract to o before tautosyllabic, but not before heterosyllabic n ?

Before turning to the contraction of prenasal diphthongs, the origin of the prenasal diphthong is investigated.

Diphthongization seems to apply in strong (stressed) position in preference to weak (unstressed) position:

in English, fa'mous¹ -> /fey'məs/
 but in'famous -> /in'fəməs/

and in Sursilvan, pi'lu -> peil
 but pilo'su -> pelu's

This general observation is further confirmed by the following prenasal alternations:

a'n -> aun	an -> <u>iden</u>
na'nu -> naun	manu'culu -> manugl
sa'nu -> saun	sana're -> sanar
pla'na -> plauna	planu'ra -> planira

A process restricted to strong position must be a strengthening process. The diphthong au must therefore be a reflex of strengthened a:

a -> a+⁴
a+ -> au

¹ An apostrophe indicates that the preceding vowel/diphthong is stressed.

⁴ + indicates a strengthened, and - a weakened element

If this claim is correct, strengthening in prenasal position should be a universal process which cannot be restricted to Sursilvan vowels. In order to find the reason why vowels should strengthen preferentially before nasal consonants, phonological interactions between vowels and following nasals in other languages are investigated.

As a result of a regressive assimilation, English vowels appear as partially nasalized when followed by nasals:

bin -> /bĩn/
but bid -> /bId/

The nasalization of prenasal vowels is often accompanied by a concomittant weakening of the nasal. In northern Italian dialects⁵ there are two different phonetic manifestations for weakened n:

Weakening to Effacement: n- -> Ø pan -> pã

Weakening to weaker element⁶: n- -> ŋ pan -> paŋ

⁵ cf. Rohlfs, 1954, p. 90

⁶ For the relation ŋ < n cf pp. 30/31 below

Weakening applies preferentially to weak elements in weak position (IDP). In Portuguese, comparatively weak (dental)⁷ nasals were effaced: lana -> lẫ, but stronger (labial) nasals did not: fama -> fama.

Syllable final position is weaker than syllable initial position, as can be observed in French masculine/feminine alternations such as fait/faite, where only the syllable final t has lost its phonetic manifestation: fait% -> |fE|, but fait%te -> |fEt|.

The appearance of a nasalized vowel in French, therefore depends on a positionally weak (syllable final) nasal.

main -> /mɛ̃/
but laine -> /lɛn/

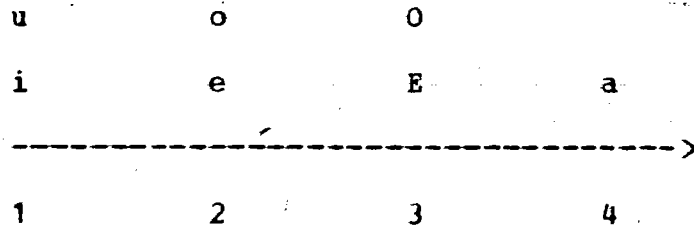
The examples given so far, indicate that nasals may be weakened as a result of nasalization. Nasalized vowels, however, seem to become stronger.

In French, nasalized vowels were lowered.

fin -> /fɛ̃/
cent -> /sɑ̃/

⁷ For the relation n < m see pp.30/31 below

The phonetic lowering of nasalized vowels corresponds to an increase of phonological strength on the eta parameter which depicts the differences in phonological strength among the Romance vowels⁸.



Nasalization induces a strengthening of the vowel accompanied by a weakening of the nasal.

Just as nasalization (vowel strengthening) depends on the inherent or positional weakness of the nasal, the weakening of the nasal may depend on the strength of the preceding vowel, as can be observed from the preferential effacement of a dental nasal after a comparatively strong vowel,⁹ but not after a weaker vowel, in Latin.

nomen -> idem

homen -> homo

⁸ Cf. Foley, 1977, p.47

⁹ For o > e cf. 1.2

The strengthening of vowels, as a result of nasalization, leads to an imbalance of phonological strength between vowel and following nasal, which causes the nasal to weaken. The complex process of nasalization is best represented as a polarization of phonological strength:

Nasalization: V N \rightarrow \tilde{V} N

Polarization: \tilde{V} N \rightarrow V+N-

This abstract phonological process can be observed in the absence of phonetic manifestations such as nasalized vowels and effaced nasals.

In the derivation below, the retention of the strengthened (nasalized) vowel contrasts with the loss of the oral vowel in different forms of the Latin verb ferre¹⁰.

ferimus	ferit	
$\tilde{f}erimus$	"	nasalization of vowel
"	fert	elision of unnasalized vowel
ferimus	"	denasalization

Although nasalized vowels are invariably strengthened, strengthened vowels may depotentiate in various ways.

¹⁰ Example from Foley, 1977, p.55

In Latin the strengthened vowel was simply retained:

ferit -> fert, but ferit+us -> fertus

In French, the strengthened vowel was promoted to a qualitatively different (stronger) vowel:

ferit -> /fɛr/, but fertus -> /fɛ̃r/

In Norman French, strengthened (nasalized) a diphthongized to au:¹¹

<u>French</u>	<u>Norman French</u>
branche	braunche
luisante	luisaunte
enchante ment	enchaunt ment

The observations made on phonological interactions between vowels and following nasals above, allow for the isolation of three distinct processes in the phonetic change of stressed a to au:

Assimilation of Nasality:

VN -> $\tilde{V}N$

Nasal Strengthening:

\tilde{V} -> V+

Diphthongization:

V+ -> D

¹¹ Cf. Pope, p. 442

The derivation of stressed prenasal a in Sursilvan consequently has the following form:

plana	planta	
plana	planta	a -> \tilde{a}
pla+na	pla+nta	\tilde{a} -> a+
plauna	plaunta	a+ -> au
<u>fa<u>il</u>s</u>	plonta	au -> o (_ n%)

With respect to the second configuration,

au -> au	(_ % n)
au -> o	(_ n %)

the question arises how contraction in plonta could be related to the syllable structure.

In Latin, long thematic vowels have been shortened by tautosyllabic, but not by heterosyllabic stops:

	/ama:%tis/	-> idem
but	/ama:t/	-> amat
	/anaba:%nus/	-> idem
but	/anaba:n/	-> anaban

Contraction might be interpreted as a type of shortening:

Long Vowel/Diphthong -> idem (_ %)

Long Vowel/Diphthong -> Short Vowel/Monophthong (_ Stop %)

This interpretation, however, does not account for the noncontraction of au before a tautosyllabic nasal followed by a velar stop:

 sanguē -> saung
but grande -> grond

 planca -> plaunca
but planta -> plonta

Contraction seems to be related to the character of the following cluster rather than to tautosyllabicity, for nasal consonants often assimilate to a following stop:

in % portante /ɪmpurtont/
in % tonare /ɪntuna/
in % carnatu /ɪŋkarnaw/

Thus: planka -> planka, but planta -> idem.

The correct configuration for contraction before tautosyllabic nasals is therefore:

plaunca: au -> idem (_ velar N %)
plonta: au -> o (_ dental N %)

Contraction not only depends on the character of the tautosyllabic nasal, but also on the character of the heterosyllabic nasal:

launa: au -> idem (_ % dental N)
loma: au -> o (_ % labial N)

Since contraction occurs before tauto-, but not before heterosyllabic dental nasals (plonta but plauna), and since it occurs before heterosyllabic labial nasals (loma), it can be expected before tautosyllabic labial nasals:

flanna -> flonna, gamba -> comba.

Contraction and noncontraction of the prenasal diphthong au in Sursilvan can be summarized in the following fashion;

au -> idem (_ ŋ)
au -> idem (_ n)
au -> o (_ n C)
au -> o (_ m)

Contraction of au to o clearly does not depend on a tautosyllabic nasal (planca -> plaunca), but rather on the quality of the nasal (plaunca, but plonta and comta), and on nasal clusters as opposed to single nasals (plonta but plauna). The question, that needs to be asked, is why some nasal consonants induce contraction but not others.

Traditionally, the change from au to o has been described as a mutual assimilation. Canfield and Davis (p.31) for instance suggest the following development for Latin au:

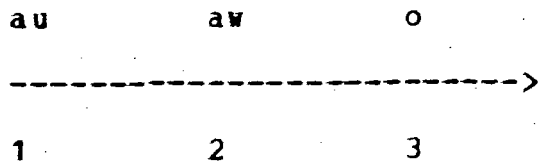
au -> Ou -> Oo -> o:

Despite its appealing obviousness, such a phonetic description says nothing about the preferential contraction of au to o in some environments but not in others, for which the phonetic change is merely an indication.

In order to find out how contraction is induced in certain nasal environments, the process of contraction has to be analyzed in theoretical terms, i.e. with reference to phonological strength.

In Theoretical Phonology, the internal structure of au and the internal structure of o are the same, namely (a,u). The phonetic difference between au and o is expressed as a difference in bondstrength.

The gamma parameter¹² measures how strongly two elements are bound together:



As an illustration, the development of the Latin diphthong /aw/ in various Romance languages is considered:

In French the bondstrength between a and w increased by one unit: /awru/ -> /or/ (a,u)₂ -> (a,u)₃

In Sursilvan, the Latin diphthong stayed the same:

/awru/ -> /awr/ (a,u)₂ -> idem

In Roumanian, the bondstrength decreased by one unit:

/awru/ -> /a%ur/ (a,u)₂ -> (a,u)₁

The phonetic change of au to o corresponds to an increase of phonological bondstrength. The general rule for the contraction of au to o is therefore:

au -> aut -> o

¹² Cf. Foley, 1977, p.41

According to the IDP, strengthening occurs preferentially in strong environments as is evident in the preferential contraction of au to o before strong German dentals¹³, but not before weaker labials or velars: ¹⁴

	<u>Gothic</u>	<u>German</u>
dental	stautan	stossen
labial	kaupon	kaufen
velar	aukon	auch

Contraction is a process that requires phonological strength which may be provided by a sufficiently strong environment (German stossen as opposed to kaufen).

The correct configuration for the contraction of au to o is therefore:

au -> idem(_ E)

au -> au+ (_ E+)

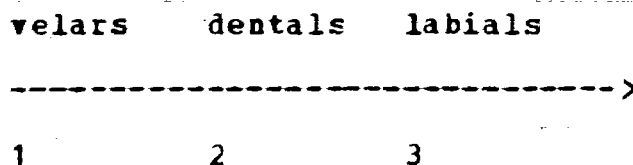
followed by

au+ -> o

¹³ Although the labials are the strongest occlusives in the Romance languages, *vita* -> *vie*, but *ripa* -> *rive* (in French), in German labials and dentals switch position on the alpha parameter, leaving the dentals as the strongest elements. Cf. Foley, 1977, p.50

¹⁴ Cf. Foley, 1977, p.118

The preferential contraction of the prenasal diphthong before dental clusters as opposed to velar clusters, and before single labial nasals as opposed to single dental nasals, can be explained with reference to the alpha parameter for the Romance languages¹⁵, as a preferential strengthening in strong environments:



Since velar nasals are weaker than dental nasals, contraction fails in plauca, but not in plonta:

plauca -> ide

but plaunta -> plau+nta -> plonta

and since dental nasals are weaker than labial nasals, contraction fails before a single n, but not before a single m:

launa -> ide

but lauma -> lau+ma -> loma

¹⁵ Cf. Foley, 1977, p.59

As an illustration for the relation: velar < dental < labial,
nasal weakening processes are considered:

In Portuguese, dental but not labial nasals were effaced:
manu -> mão, but ramu -> ramo.

In Bernese, a Swiss German dialect, velar but not dental nasals
were effaced before continuants:

German	Bernese	English
n -> idem (_ s)		
Gans	Gans	goose
kommst	chunsch	come (2.sg-)
<u>but</u> ŋ -> ʃ (_ x)		
denken	tæiche	to think
Schinken	Scheiche	ham/leg

Contraction in plonta but not in plauuca , and in lcma but not
in launa, has now been related to the inherent strength of the
following nasal as represented by the alpha parameter.

But why should contraction occur before tautosyllabic but not
before heterosyllabic dental nasals ?

	pane -> paun
but	pannu -> ponn
	planta -> plonta

According to the IDP, weakening applies preferentially to weak elements. In Portuguese, single dental nasals are effaced, but the respective geminates are not:

manu -> mão, but annu -> anno.

In Sursilvan, Latin t weakened to d, but the geminate tt only degeminated:

mettere -> /mEtär/, but meter -> /mEdär/.

The configurations: nn -> idem , but n -> Ø
 tt -> t , but t -> d

suggest the relation: CC > C

allowing for the conclusion that homorganic clusters are stronger than their respective single counterparts.

In order to determine the sufficient strength for the contraction of the prenasal diphthong in Sursilvan, two different constellations need to be combined:

1. Contraction induced by **qualitative** strength:

au -> idem (_ n) |n| = 1

au -> idem (_ n) |n| = 2

au -> o (_ m) |m| = 3

2. Contraction induced by **quantitative** strength:

au -> idem (_ n) |n| = 2

au -> o (_ n+C) |n| + |C| = 2 + 1 = 3

The contraction of the prenasal diphthong au in Sursilvan, depends on the strength of the nasal environment, a combination of qualitative and quantitative strength:

Quantitative

Strength: |N| = n |N+C| = n + 1

Qualitative

Strength:

|n| = 1 1 : saun 1+1=2 : plaunka

|n| = 2 2 : launa 2+1=3 : plonta

|n| = 3 3 : lona 3+1=4 : flonna

In Sursilvan, prenasal au contracts to o, when the strength of the nasal or the nasal cluster equals or exceeds the value 3:

au -> idem(_ N C) if |N| + |C| < 3

au -> au+ (_ N C) if |N| + |C| > 3

followed by au+ -> o

Instead of interpreting the data in articulatory terms, where the preferential application of contraction cannot be explained, the process of contraction has been investigated with reference to the relations among the phonological elements, and expressed numerically. Philologists such as Huonder (p.22) and Gartner (p.133) "explained" the appearance of the rounded glide before velar nasals with the velar quality of the nasal. This phonetic reductionism, typical of philological phonetics, explains nothing and furthermore contradicts the data as shown below.

In the dialect spoken in Ems (Sutsilvan), au contracts to o even in velar environments (Gartner, p.134):

hanc -> onc

lana -> lona

grande -> gron

clamat -> kloma

flamma -> flona

Whereas in Engadinian au does not contract before nt.¹⁶ Both developments can be explained with reference to the theoretical findings made above:

The Sursilvan dialect represents a simple generalization, (au -> o) having dropped the condition {N(C)} ≥ 3, while the Engadinian dialect makes exclusive reference to the values represented by the alpha parameter, ignoring the difference between single consonants and consonant clusters.

In this section, the two reflexes of stressed a before nasals in Sursilvan have been related to each other with universal processes such as:

1. Nasalization: a -> \tilde{a}
2. Nasal Strengthening: \tilde{a} -> a+
3. Diphthongization: a+ -> au
4. Contraction: au -> au+
- au+ -> o

The preferentiality of linguistic change has been evident in the preferential diphthongization of strengthened (nasalized) a, and in the preferential contraction of au before strong n, but not before weak ɲ and single n, and before relatively strong dental clusters as opposed to velar clusters and single dental nasals.

¹⁶ Cf. Schorta, p.25

2.2 Different Vocalic Reflexes before m and n

In the previous section, the diphthongization and contraction of stressed a in prenasal position has been demonstrated. This section illustrates the preferential contraction of prenasal diphthongs in sufficiently strong nasal environments by investigating the different vocalic reflexes of the remaining Sursilvan vowels before relatively weak dental nasals and before strong labial nasals.

In order to interpret the development of prenasal vowels (other than a), the development of closed vowels in Sursilvan needs to be illustrated.

Regardless of the environment, Romance u changes to i:

duru -> dir
acutu -> tgit
luna -> glina
fumare -> fimar

and Romance o changes to u:

tottu -> tutt
colore -> culur
sapone -> savun
nomen -> num

There are thus three closed vowels in Sursilvan: e, u, i, all of which diphthongize in originally open syllables (cf. below). For the time being, it suffices to show that e diphthongizes in open syllables, and that closed mid vowels have identical reflexes before oral and nasal consonants:

e -> ei (_ %): pilu¹⁷ -> peil
 sinu -> sein

but e -> idem (_ C %): firmu -> fern
 vincere -> vencer

Open mid vowels, however, are raised in prenasal position (as a result of prenasal diphthongization parallel to the diphthongization of a), yielding the same reflexes as closed mid vowels before oral and nasal consonants:

Front Mid Vowels:

open	lEve -> lEv	<u>but</u>	bEne -> bene -> beyn
closed	tela -> teyla	<u>and</u>	plena -> pleyna

Back Mid Vowels:

open	nOva -> nOva	<u>but</u>	bOna -> bona -> buna
closed	voce -> vusch	<u>and</u>	sapone -> savun

¹⁷ Short Latin i = Romance e.

Since Romance u and o change to i and u respectively, and since open mid vowels have the same reflexes before nasals as closed mid vowels, there are only four basic vowels left in prenasal position: a, e, u, i. All of these vowels show different reflexes before n than before m.

The difference may appear as an opposition between diphthong (before n) and monophthong (before m), as in

manu -> man /aw/	but	ramu -> rom /O/
plena -> pleina /ey/	but	semen -> sem /E/

or as an opposition between closed and long vowels (before n) and open and short vowels (before m), as in

bona -> buna /u:/	but	homo -> um /U/
una -> ina /i:/	but	fumat -> fema /e/

Although an analysis which explains the behaviour of prenasal a has been made, it is not clear yet how the remaining prenasal vowels (e, u, i) developed.

As shown above, closed e diphthongized regardless of the nasal environment, but according to the syllable structure, i.e. e appears to stay the same in closed syllables.

e:	verde -> verd	or	e -> idem (_ C %)
but	rete -> reit	or	e -> ey (_ %)

This configuration seems to contradict the configuration
obtained for i:

while e stays the same in closed syllables, i seems to stay the
same in open syllables.

i: tritu -> trit or i -> ide# (_ %)
 triste -> trest or i -> e (_ C %)

This confusion however is solely due to the orthographic
surface.

A proper understanding of the situation must be based on
accurate observations.

1. Although only the diphthongization of e is orthographically
represented (ei), all closed vowels diphthongize in open
syllables:

tela -> teyla

flure -> fluwre

filu -> fiylu

Evidence for this claim is the appearance of a so called
hardened glide as a velar stop, a common phenomenon of many
Raetoromansh dialects. Lausberg (p. 155) mentions tegla for
teyla and fikl for fiyl (p. 153) in Sutsilvan and Engadinian,
and Bourciez (p. 609) mentions flukr for fluw in Engadinian.

2. All monophthongs which are not exposed to the raising influence of a following glide are lowered:

loma -> [lɔma]

cuppa -> [kʊpə]

verde -> [vɛrd]

triste -> [trɛst]

3. Where no hardening of the glide has occurred, the diphthong may appear as a long monophthong, if vowel and glide are sufficiently similar:

i: for iy

u: for uw

but ei for ey

The development of i in open and closed syllables consequently has the following form:

filat ¹⁸	villa	
fiylat	"	i -> iy (_ %)
"	vella	i -> e
fi:lat	"	iy -> i:
fila	vella	MR (orthography)

In section 2.1, it has been shown that prenasal aw contracted

¹⁸ Latin filat = to spin, 3.sg.

before n (|N| = 3), but not before ŋ (|N| = 2). The contraction of diphthongs before sufficiently strong nasal environments is however not restricted to the diphthong aw, but applies to ey, iy and uw as well.

1. ey -> e -> E (_ n)

avena	se n en	
aveyna	sey n en	V -> D (_ %)
"	se n en	D -> D+ -> H (_ n)
"	sE n en	lowering
aveina	se n	MR (orthography)

2. iy -> i -> e (_ n)

unu	fumu	
inu	fi u u	u -> i
iy u	fiy u	V -> D (_ %)
"	fi u u	D -> D+ -> H (_ n)
"	fe u u	lowering
i:nu	"	iy -> i:
in	fe n	MR (orthography)

3. uw -> u -> U (_ n)

bCnos	hOmo	
bunos	humo	O -> o -> u (_N)
buwno	huwmo	V -> D (_X)
"	humo	D -> D+ -> M (_m)
"	hUmO	lowering
bu:nos	"	uw -> u:
buns	uM	MR (orthography)

Although all nasal stops are members of the same natural class, labial and dental nasals seem to participate in different rules, this difference is particularly evident in Sursilvan, where all vowels have different reflexes before m and n. This systematic difference is an instantiation of the preferentiality of linguistic change, and has been related to the preferential contraction of prenasal diphthongs in sufficiently strong environments and the diphthongization of closed vowels in open syllables.

On the following page, the development of the different reflexes of prenasal Sursilvan vowels before single dental nasals and before single labial nasals is summarized.

The Preferential Development of Prenasal Vowels in Sursilvan:

manu	ramu	unu	funu	
"	"	inu	finu	u -> i
mawnu	rawnu	inyu	fiyu	Diphthongization
"	romu	"	finu	Contraction (_ N > 3)
"	romu	"	fenu	Lowering
mawn	rom	i:n	fem	NR
<u>maun</u>	<u>rom</u>	<u>in</u>	<u>fem</u>	Orthography
bene	femina	cena	semen	
bene	femina	"	"	E -> e (_ N)
beyne	feymina	ceyna	seymen	Diphthongization
"	femina	"	semen	Contraction (_ N > 3)
"	femina	"	semen	Lowering
beyn	femna	ceyna	sem	NR
<u>bein</u>	<u>femna</u>	<u>ceina</u>	<u>sem</u>	Orthography
bona	homo	sapone	nomen	
bona	homo	"	"	o -> o (_ N)
buna	hunu	sapune	numen	o -> u
buwna	hwnu	sapuwne	nwwnen	Diphthongization
"	humo	"	numen	Contraction (_ N > 3)
"	humo	"	numen	Lowering
bu:na	un	savu:n	num	NR
<u>buna</u>	<u>un</u>	<u>savun</u>	<u>num</u>	Orthography

Summary

In this chapter, superficially disparate alternations in prenasal environment have been related to each other with a small set of universal processes which have been validated with reference to the same processes operating in other languages. This was possible because the phonetic changes have been interpreted as instantiations of more abstract phonological processes.

All of the established rules failed to apply to whole classes of phonological elements; but they applied preferentially to certain elements of given classes.

The results of the investigation carried out in this chapter are briefly repeated in three parts:

1. Relating Prenasal Reflexes

Henceforth unrelated reflexes such as the diphthong au and the raising of a to o in prenasal environments, have been shown to be the result of a rule that diphthongizes stressed a as a result of prenasal strengthening, followed by the preferential contraction of au in sufficiently strong nasal environments.

The lowering of closed vowels (e,u,i) before m has been related to the contraction of au before strong nasals, by showing that all monophthongs, whether original or from contracted

diphthongs, yield low reflexes in Sursilvan.

2. Accounting for the Processes

The phonetic changes, diphthongization and contraction have been shown to be the result of more abstract phonological strengthening processes:

Nasalization:

$V N \rightarrow \tilde{V} N$

-> Polarization:

$\tilde{V} N \rightarrow V+N-$

-> Diphthongization:

$V+ \rightarrow D$

Environmental Strengthening:

$D \rightarrow D+ (N) \text{ if } |N| \geq 3$

-> Contraction:

$D+ \rightarrow M$

It has been demonstrated that these processes apply in different languages and under different conditions.

3. Preferential Application of Processes

Linguistic evolution is not only conditioned by the inherent qualities of a linguistic element, but also by the inherent qualities of its position and its environments. These qualities can be represented numerically. A given development

(strengthening or weakening) is therefore expected to evolve unidirectionally: starting at the right end of a scale for strengthening, and at the left hand of the scale for weakening processes. Phonological processes manifest themselves in expanding rule schemata. The expansion however is predictable on the basis of the IDP. The rule schema for the contraction of prenasal au has been shown to have the following expansion:

Contraction:

1. au -> o (_ n C) n + C = 3 + 1 = 4 flocma
2. au -> o (_ n) n = 3 loma
- au -> o (_ n C) n + C = 2 + 1 = 3 plonta

Noncontraction:

3. au -> au (_ n) n = 2 plauna
- au -> au (_ ŋ C) ŋ + C = 1 + 1 = 2 plaunka
4. au -> au (_ ŋ) ŋ = 1 saung

III. The Development of Open Mid Vowels

Concentrating on French as the most developed and on Italian as a very conservative Romance language, philologists observed that in both languages open mid vowels diphthongize in open syllables.¹ They reasoned that diphthongization should therefore be a consequence of the lengthening of originally short mid vowels in open syllables. This conclusion led to generalisations such as:

La seule diphthongaison véritable est celle qui provient du dédoublement ou ségmentation d'une voyelle accentuée longue et libre;...²

The philological view can be summarized with the following rules:

Lengthening:	$V \rightarrow V: \left(\frac{a}{b} \text{ } \text{ } \right)$
Duplication:	$V \rightarrow VV$
Differentiation:	$VV \rightarrow V(x)V(y)$

¹ For monosyllables in French and proparoxytones in Italian see 3.2, for vowels combining with a metathesized glide see 3.3.

² Bourciez, p.142 and elsewhere

In Spanish and Sursilvan however, diphthongization is not restricted to open syllables:

Latin	Italian	French	Spanish	Sursilvan
novu	nuovo	neuf	nuevo	nief
mortu	morto	mort	muerto	miert

Instead of giving up their claims in face of the Spanish counterexamples, philologists did not hesitate to reshape the data according to the 'open syllable hypothesis'. The fact that certain consonant clusters, such as 'muta cum liquida', do not close a syllable (pe%tra -> pie%tra (I), fe%bre -> fie%vre (F)), led them to believe that this may be the case for other clusters in Spanish³, but not in French or Italian:

French	petra -> pie%rre	but	morta -> mor%te
Italian	petra -> pie%tra	but	morta -> mor%ta
Spanish	petra -> pie%dra	<u>and</u>	morta -> mue%rta

Those philologists who were suspicious of such an ad hoc solution, simply explained the Spanish diphthongization as a result of a generalization.

³ Cf. Bourciez, *ibid.*

The Sursilvan data, however, suggests neither reanalysis of the syllable nor the generalization of diphthongization from open to closed syllables, but rather the influence of the final vowel.

	<u>open syllable</u>	<u>closed syllable</u>
<u>u</u> #	novu -> niev mediu -> miez	mortu -> miert ferru -> fier
<u>a</u> #	nova -> nova media -> mesa	morta -> morta terra -> tiara

Open mid vowels diphthongize to ie regardless of the syllable structure, but only when followed by final u. E moreover seems to diphthongize preferentially in closed syllables even in words ending in a : terra -> tiara.

This situation is the reason why Palle Spore, in his summary work on the Romance diphthongization, refers to the diphthongization in the Raetoromansh languages as "yet to be explained":

Si certaines langues presentent la diphthongaison generalisee, c'est ou bien que la diphthongaison en syllabe fermee est un phenomene relativement moderne (wallon) ou bien que la coupe syllabique a change (espagnol); les idiomes rhetiques restent encore a expliquer.*

* Spore, p. 35

The purpose of this chapter is to present an explanation of the two diphthongized reflexes of open mid vowels :

1. ie from o and e before final u,
2. ia from e before certain consonant clusters, in words ending in a vowel other than u.

In 3.1, the change of e to ia will be interpreted not as a genuine diphthongization, but as the result of the addition of a metathesized schwa generated between two consonants.

In 3.2, diphthongization is analyzed and interpreted as a universal phonological process governed by a universal condition, although this condition may assume various forms on the phonetic surface of different languages.

In 3.3, the influence of the final vowel on diphthongization is investigated. The philological explanation (metaphony) will be rejected in favour of a more abstract solution: the fluxion of phonological strength (polarization).

3.1 Pseudodiphthongization of E

Regardless of the syllable structure, Sursilvan open mid vowels diphthongize to i'e [iə] in words ending in a final y, whereas in words ending in a final a no diphthongization takes place.

	<u>open syllable</u>	<u>closed syllable</u>
<u>u</u>	novu -> niew	mortu -> miert
	mediu -> miez	ferru -> fier
<u>a</u>	nova -> nova	morta -> morta

In closed syllables, open e, changes to ia' [ya] in words ending in vowels other than y:

media -> mesa festa -> fiasta

Since the change of E to ia is clearly not related to the general diphthongization before final y (as outlined in the following pages), two distinct configurations are proposed:

1. Diphthongization proper as the result of polarization,
discussed in 3.3 :

O, E -> ie (_ CXu #) ⁵

O, E -> ider (_ CXa #)

2. The apparent diphthongization of E in closed syllables:

E -> idem (_ Ca #)

E -> ia (_ C%Ca #)

In this chapter, the diphthongization of E restricted to closed syllables (configuration 2), is interpreted, not as a genuine diphthongization, but as the result of the addition of a metathesized schwa generated between two consonants.

Our investigation begins with questions based on the two relevant configurations.

⁵ X indicates one or two optional consonants

1. E -> idem (_ %) mEder (< metere)
- E ->ia (_ C %) piarder (< perdere)

Why does E change into a diphthong in closed but not in open syllables ?

2. O ->idem (_ C %) sOrt (< sorte)
- E ->ia (_ C %) siarp (< serpe)

Why does O which otherwise underwent the same development as E (ie before final u), not diphthongize in the same environment ?

Although philologists claimed that [ya] is the result of a stress shift applied on [iə], explaining the relationship between ie and ia in the following equation,*

iə to ya as V: to V

the change of E to ia cannot be the result of a proper diphthongization, and therefore is not related to the change of E to ie, for the following reasons:

* Based on the observation that ia only appears in closed syllables, i.e. only for short vowels, cf. Luedtke, p.238

1. Historical reasons:

The conversion of E to ia must be of a much more recent date than the diphthongization induced by polarization. In a Sursilvan text from 1648⁷, the following orthographic representations can be found:

niev	for	novu
chierp	for	corpu
tschiel	for	caelu
tiers	for	tertius

but festa, bella, serpe, which in modern Sursilvan yield fiasta, biala and siarp, have no other orthographic manifestation.

2. Phonetic reasons:

- a. A simple stress shift would convert i'e to ie' (as in fact it did in French, Spanish and Italian), but not to ia'.
- b. Sursilvan ia corresponds to Sutsilvan ea (pearder, beala, teara), the development of E to ia must therefore have been: E > E'a > ea' > ia'.

⁷ Cf. Ulrich, p.9

3. Theoretical reasons:

- a. The philological contention that diphthongization is the result of a previous lengthening in open syllables contradicts Luedtke's claim that diphthongization of E to ia should be the result of a previous shortening in closed syllables.
- b. The preferential diphthongization in closed syllables contradicts our interpretation of diphthongization as a strengthening process (cf. 2.1 above and 3.2 below).

Because of these reasons, the change from E to ia is treated as a separate development, governed by another process than diphthongization.

The claim that the diphthongization of E is restricted to closed syllables is based on data such as: perdere > piarder, but metere > meder. If however diphthongization depended on a closed syllable, it should also occur in mel and fel, in which diphthongization fails: /mEl/, /fEl/.

The correct configuration therefore should indicate that the change of E to ia takes place in closed syllables but only before two consonants:

E -> idem (_ C)

E -> ia (_ C% C)

As a result of strengthening, epenthetic elements may be inserted between two consonants:

generu		
gen+ru	syncope:	V -> Ø + S*
gendru	epenthesis1:	(nr) + -> ndr
gendr+	apocope:	V -> Ø + S
gender	epenthesis2:	(dr) + -> der

Cluster strengthening, resulting in the insertion of a glide between two consonants, is evident in the various reflexes for PEI *nokt-:⁹

German	Roumanian	French	Sursilvan ¹⁰	
nokte	nokte	nokte	nokte	
nokhte	nokwte	nokyte	nokyte	glide insertion
noXte	nopte	noyte	"	contraction
"	"	"	noktye	metathesis
"	"	"	noktsye	assibilation
Nacht	noapte	nuit	notg	NR (orthography)

* S = unit of phonological strength

⁹ Cf. Poley, 1981, pp. 95-96

¹⁰ Spanish underwent the same development as Sursilvan: nokyte > noktye > noche.

Inserted glides may be vocalized and appear as anaptyctic vowels as in English substandard filə for film, in Latin ager from *agr or in Russian gorod from PIE *ghortos.

But how could anaptyxis be related to the change of E to ia? Although diphthongization proper is a consequence of a previous strengthening of the vowel (as shown in 2.1), some diphthongs are a result of a combination of an original vowel and a metathesized glide, as in English oyster from *ostrea, or in French:

coriu	cor	
coiru	"	metathesis
cuiru	"	raising
"	cuor	diphthongization
cuir ¹¹	coeur	MR (orthography)

The change of E to ia may be interpreted as a result of an addition of a metathesized anaptyctic vowel¹².

perdere	metere	
perǝdere	"	anaptyxis
peǝrdere	"	metathesis
piǝrdere	"	differentiation
piarder	meder	MR (orthography)

¹¹ In Sursilvan cuir developed further: cuir > cūir > tgir.

¹² Anaptyctic cluster reductions are common in Sursilvan: genru -> schiender, macru -> maghër

Anaptyxis however fails if an oral stop is followed by a liquid, thus: petra -> pedra. In the Romance languages, consonant clusters such as tr, pr and pl, which are referred to as muta cum liquida, generally fail to close the preceding syllable. This is evident in the diphthongization of open mid vowels in French and Italian before original tr-clusters which contrasts with the nondiphthongization of open mid vowels in closed syllables:

French: pE % tra -> pierre, but fEr % ru -> fer

Italian: pE % tra -> pietra, but fEr % ru -> ferro

Muta cum liquida in initial position have therefore been treated as single consonants¹³ where the liquid is interpreted as an offglide of the voiceless stop, i.e. tr = tʃ. Failure of anaptyxis is further evident in the development of Sursilvan U, from Latin short u, which appears as the diphthong uo [Uə] in the same environment as ia from E; both diphthongs are claimed to be the result of an addition of a metathesized schwa.

dupla	culpa	
dupla	"	pl -> pʃ
<u>fails</u>	culəpa	anaptyxis
"	cuəlpə	metathesis
dupla	cuolpa	MR (orthography)

¹³ Cf. Lausberg, p.98

Thus:	perdere	petra	
	per@dere	<u>fails</u>	anaptyxis
	pe@rdere	"	metathesis
	piarder	pedra	MR (orthography)

So far it has been hypothesized that the appearance of a diphthong in perdere (piarder) and culpa (cuolpa) is the result of a metathesized anaptyctic schwa.

Turning to the second configuration that has been isolated above,

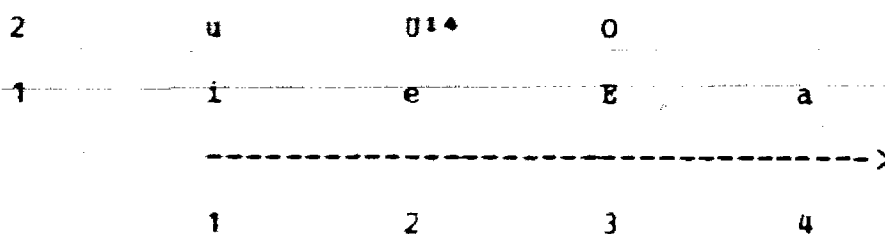
O -> idem (_ C% C) mOrta
 E -> ia (_ C% C) flasta

the question arises what phonological reasons could account for the restricted occurrence of this process after two vowels as phonetically different as E and U, and its apparent failure if the vowel is O.

Metathesis seems to be related to the strength of the vowel, for metathesized schwa is only evident in stressed position :

tu'rnat	turna're	
tur@nat	tur@nare	anaptyxis
tu@rnat	<u>fails</u>	metathesis
tuorna	turnar	MR (orthography)

Metathesis depends on the attracting influence of a strong preceding vowel. The question is, what is the sufficient strength for a vowel to induce metathesis of an anaptyctic schwa? In the combined eta/omega parameter for the Romance languages,



the following values obtain:

a , O = 5

E , U = 4

e , u = 3

and i = 2

Metathesized anaptyctic schwa is evident after vowels with the relative phonological strength 4 (cuolpa, piarder), but not after stronger (MOrta), or weaker vowels (ferma).

^{1*}Since o does not exist in Sursilvan, the same relation that obtains for e and E is assumed for u and U, unless evidence to the contrary is adduced.

Given the failure of metathesis in turna'r and in ferma, which suggests that metathesis depends on the attraction exerted by a sufficiently strong vowel, the following condition is arrived at:

$v\ c\ \bar{a}\ c \rightarrow v\ \bar{a}\ c\ c$

for $|V| \geq 4$

Since the claim made above implies metathesis of schwa if preceded by a vowel with equal or greater phonological strength than \bar{a} , such as \bar{a} and \bar{o} , the next question is : why does schwa not appear phonetically after \bar{a} or \bar{o} ($|V| = 5$) ? Before proposing a solution, another related process is considered.

In the Romance vowel shift, all short vowels, except \bar{a} , were lowered one position (cf. above). This coherent shift has been proposed to be the result of a general schwa addition rule¹⁵ which caused short vowels to be lowered but not long vowels, and, most importantly, not short \bar{a} :

thus: $a + \bar{a} \rightarrow a\bar{a} \rightarrow a.$

The absorption of a schwa by \bar{a} can be interpreted as a consequence of sufficient phonological strength.

¹⁵ James Foley, personal communication

The conditions on the two distinct processes, metathesis and absorption, can be represented in the following way:

1. Metathesis: $|V| = 5$: aCəC → aəCC, oCəC → oəCC
 $|V| = 4$: eCəC → eəCC, uCəC → uəCC

but: $|V| = 3$: eCəC → idem
 $|V| = 2$: iCəC → idem

2. Absorption: $|V| = 5$: aə → a, oə → 0

but: $|V| = 4$: eə → idem, uə → idem

The previous analyses of anaptyxis, metathesis and absorption lead to the following derivation:

pOrta	hErba	tUrnat	ferna	
pOrəta	hErəba	tUrənət	ferəna	anaptyxis
pOərta	hEərba	tUərnət	<u>fails</u>	metathesis
pOrta	<u>fails</u>	<u>fails</u>	"	absorption
porta	jarva	tuorna	ferna	MR (orthography)

In this section, the change of E to ia has been interpreted as a result of the addition of a metathesized anaptyctic schwa generated between two consonants rather than the result of a proper diphthongization. Moreover, this process has been found to apply to U, which changes to uo (tuorna, cuolpa), in the same environment as E to ia.

The three processes that have been isolated, have been found to apply preferentially rather than indiscriminately:

1. Anaptyxis has been shown to fail in muta cum liquida clusters which have been interpreted as single consonants: piarder, but pedra; cuolpa, but dupla.

2. Metathesis of the anaptyctic schwa depends on the strength of the preceding vowel:

tU'rna -> tU'arna, but tUrna'r -> idem.

3. Absorption of the metathesized schwa takes place if the vowel with which the schwa combines is sufficiently strong:

Since Q is stronger than E, the metathesized schwa does not show on the phonetic surface if it combines with Q:

mOrta -> idem, but tErra -> tiara.

3.2 A Universal Condition on Diphthongization

Contrary to the superficial treatment of diphthongization by philologists whose goal was phonetic description, description in Theoretical Phonology is not a goal, but rather the stage in an investigation where questions are asked. Although every explanation is (implicitly or explicitly) preceded by questions, not every question elicits a scientific explanation. Bertrand Russell distinguished two types of questions:

When we ask 'why?' concerning an event, we may mean either of two things. We may mean 'What purpose did this event serve?' or we may mean; 'What earlier circumstances caused this event?' The answer to the former question is a teleological explanation, or an explanation by final causes; the answer to the latter question is a mechanistic explanation ... experience has shown that the mechanistic question leads to scientific knowledge while the teleological does not. ¹⁶

Phonemicists tried to interpret the purpose of linguistic changes (such as diphthongization) with phonemic pressure. Romeo¹⁷, for instance, claimed that the early monophthongization of Latin au to o exerted pressure on the phonemic systems of the postclassical period, since o (from au) was merging with o (from o).

¹⁶ Russell, p. 84

¹⁷ Romeo, p. 70

In order to escape the impending merger, o (from o) had to diphthongize. This claim contradicts the data in two ways:

1. In Tuscany, where au monophthongized to o (poco, oro, toro etc.¹⁸), o did not diphthongize (ovo, foco, core, rota etc.¹⁹) despite the alleged phonemic pressure:

au -> o but o -> idem

2. In Sursilvan on the other hand, au stayed the same (pauc, aur, taur etc.), but o diphthongized (niev, niert etc.) in the absence of said pressure:

au -> idem but o -> ie

The teleological position held by phonemicists which maintains that the purpose of diphthongization is the maintenance of phonemic discreteness (i.e. ease of perception), has to be rejected not only because it is contradicted by the data, but because it raises a plethora of unanswerable questions, and because it says nothing about the complex nature of linguistic change as illustrated in the preferential development of vowels before nasals above.

¹⁸ Cf. Rohlfs, 1949, p. 110

¹⁹ *ibid.*, p. 186

In Theoretical Phonology, the question is not for what purpose there exists a phonological rule such as diphthongization, but under which conditions does it apply and what are the linguistic principles that govern it ?

In Theoretical Phonology therefore, to explain a phonological rule means:

1. to isolate its preferential application with contrastive configurations,
2. to summarize these conditions in a more abstract way, by relating rules to other rules and general phonological processes, and,
3. to interpret the behaviour of phonological elements in terms of universal principles such as the IDP, the principle of strength fluxion and strength conservation, and the principle of attenuation and concentration as introduced by Foley (1977, 1979 and 1981).

In chapter two (2.1), it has been shown that diphthongization can be interpreted as a manifestation of phonological strength.

In support of this claim illustrative configurations are considered according to the types of phonological strength(-ening) involved.

1. Diphthongization as a Result of Inherent Strength:

a. Qualitative Strength:

Since open mid vowels are stronger than closed mid vowels²⁰, they diphthongized first in French, and in Spanish and Italian exclusively:

no'du -> nodo (I), nodo (Sp)	V -> idem (V < ■)
no'vu -> nuovo (I), nuevo (Sp)	V -> D (V > ■)

b. Quantitative Strength:

In English, diphthongization was restricted to comparatively strong (long) vowels:

full -> full	V -> idem
fu:l -> foul	V: -> D

c. Intonative Strength:

In Spanish, as in other languages, diphthongization applies preferentially in strong stressed position (as shown in 2.1):

festivo -> idem	V -> idem
fe'sta -> fie'sta	V' -> D

²⁰ Cf. p.60 above

d. Intonative Strength²¹:

Although in Sicilian, open mid vowels are not diphthongized in normal speech, they are diphthongized in emphatic speech:²¹

To'ni -> idem	V' -> idem
To''ni -> Tuoni	V'' -> D

2. Phonological Strength and the Size of the Linguistic Unit:

a. Attenuation in the Syllable:

The preferential diphthongization in open syllables can be explained with reference to the absolute strength of a vowel in relationship to the syllable:

m o r' sto -> morto	V -> idem	(for V = 1/3)
n o' v'c -> nuovo	V -> D	(for V = 1/2)

²¹ Der Name Toni, VincEnzu wurde in ruhiger Rede mit offenem Vocal gesprochen. Rief aber jemand die Namen, so hiess es Tuoni, Vincienzu. (Schneegans, Heinrich: Laute und Lautentwicklung des sicilianischen Dialektes, Diss., Strassburg, 1888, p. 18)

b. Attenuation in the Word:

Although Italian open mid vowels diphthongize in open syllables of paroxytones, they do not diphthongize in proparoxytones where the absolute strength of each syllable is less than $1/2$.

pe'ɰde → piede V → D (for |S| = 1/2)
te'ɰpiɰdo → tepido V → idem (for |S| = 1/3)²²

c. Strength Concentration in the Word:

Although in French, o and e did not diphthongize in closed syllables of paroxytones, this is not true for monosyllabic words, in which the absolute strength of the vowel is sufficiently great to diphthongize even in closed syllables.

morta → morte V → idem (for |V| < 1/3)
cor → coeur V → D (for |V| = 1/3)

²² Wartburg's remarks are apposite: "Die Woerter, die durchgehendes E haben, tragen alle ihre Erklarung in sich: pecora, tepido... sind Proparoxytone; hier heisst die Druckverteilung." (p.118)

3. Diphthongization as a Result of Environmental Strengthening:

Prenasal Strengthening:

AS shown in chapter two, vowels may diphthongize as a result of prenasal strengthening.

la'ku -> lag V -> idem (_ oral C)

ma'nu -> maun V -> D (_ nasal C)

Although the question why diphthongization occurs at all remains unanswered, it is possible to show why some vowels diphthongize but not other vowels, and why diphthongization occurred in some environments but not in others.

AS a manifestation of phonological strength, diphthongization occurs preferentially to sufficiently strong or strengthened vowels:

Universal Rule: V -> D

Universal Condition: |V| > n

Parochial Conditions: n varies from language to language

3.3 Metaphony or Polarization ?

Sursilvan is the only Romance language in which both open mid vowels yield identical reflexes when diphthongized:

ferru -> fier, hortu -> iert.

Although Italian, Spanish, French and Sursilvan diphthongize E to ie, they differ in the extent to which diphthongized o developed. Diphthongization proper converts o to uo, occurring in medieval Spanish and modern Italian (nuovo). In Spanish, French and Sursilvan, the second part of the diphthong was derounded by syneresis : nuovo -> nuevo. Syneresis is a repetition of the Latin rule which derounded o after a labial element: vorto > ^uv^orto > ^uVerto > verto. In modern French, ue contracted to o (orthographic eu: neuf) and in Sursilvan, ue derounded to ie:

nuev > nüev > niev .²³

1.	Diphthongization	o -> uo	Italian
2.	Syneresis	uo -> ue	Spanish
3.a	Contraction	ue -> o	French
3.b	Derounding	ue -> ie	Sursilvan

²³ Although there seems to be no obvious reason for derounding, English, German and Sursilvan data suggest that it applies preferentially to central rounded vowels. In English and Swiss German e.g.:

mus -> idem, but müs -> mis.

As shown above, diphthongization in Sursilvan depends on an original final u:

	cor -> cor	mel -> mel
	nova -> nova	media -> mesa
but	novu -> niev	mediu -> niez

Similar situations in Italian dialects (~~nuovi, novu but nove, nova~~) led to the philological hypothesis that diphthongization in the Romance languages was originally caused by metaphony. Rohlfs distinguished two different phonological changes induced by metaphony : raising and diphthongization followed by differentiation:

Es erleidet der Oeffnungsgrad der unter Starkton stehenden Silbe entweder eine Schliessung um eine Vokalstufe (O > o, o > u, E > e, e > i) oder es wird im Falle der Diphthongierung der betonte Vokal in zwei Teile zerlegt, wobei in der ersten Teil der Harmonisierungsprozess staerker, zum Ausdruck kommt als in dem zweiten Teil : O > uo, E > ie. Artikulatorisch gesehen, beruht der Umlaut (wenn er durch -i oder -u ausgeloesst ist) auf einer Hebung der Zunge gegen das Velum bzw. gegen den Vordergaumen.^{2*}

^{2*} Rohlfs, 1949, p. 55

Although metaphony seems to account for the data on the surface, it has to be rejected for the following reason:

Metaphony has been referred to as a type of assimilation ("assimilation a distance", Spore, p. 294) or as vowel harmony ("Fernharmonisierung", Lausberg, p. 168), which influences the previous vowel. Assimilatory fronting is apparent in English words such as feet (< fōti < foti) and mice (< mūsi < musī). But a priori there is neither a phonetic, nor phonological reason why the stressed vowel should diphthongize because of a following high vowel. In fact the only environment blocking diphthongization in Spanish is a following glide which raises the stressed vowel; in Sursilvan a similar situation obtains.

Spanish:	cEntu	vEnyo	
	"	venyo	raising
	cientu	<u>fails</u>	diphthongization
	ciento	vEngc	MR
Sursilvan:	nOvu	fölyu	
	"	fölyu	fronting
	nuovu	<u>fails</u>	diphthongization
	niev	fegl	MR

Having rejected metaphony as a plausible cause for diphthongization, we proceed by asking the following questions:

1. If metaphony, which raises or fronts the vowel, does not induce diphthongization, what else does?
2. If diphthongization is in some way related to the final vowel, why does neither the strongest vowel a, nor no final vowel induce diphthongization : nova / cor -> idem, but nova -> niev ?

In 2.1 it has been shown that diphthongization has to be interpreted as a strengthening process. In French this strengthening was counteracted by the strongest vowel a:

tenet -> tient
but levat -> lève

This otherwise inexplicable phenomenon has been explained²⁵ with reference to the principle of polarization, the fluxion of phonological strength between two elements:

tenet	levat	
"	le-va+t	polarization
tienet	<u>fails</u>	diphthongization
tient	lève	NR

²⁵ Cf. Foley, 1979, p.205.

Another example for polarization is evident in the preferential syncope in Sursilvan proparoxytones ending in strong a:

asinu	asina	
"	asi-na+	polarization
<u>fails</u>	asna	syncope
asin	"	apocope of V < a
asen	asna	MR (orthography)

The fluxion of phonological strength (polarization), from the radical vowel (on the left) to the final vowel (on the right), prevents diphthongization in French. In ~~Sursilvan~~ however, the fluxion of phonological strength has taken place in the opposite direction:²⁶

nOvu	nCva	cOr	
nO+vu-	"	"	polarization
nuovu	<u>fails</u>	<u>fails</u>	diphthongization
niev	nova	cor	MR (orthography)

²⁶ If nondiphthongization in Sursilvan depended on the presence of a strong final vowel, monosyllabic words should have diphthongized, but cor -> ide.

In Sursilvan, the difference between the phonological strength of the final and the radical (stressed) vowel results in a fluxion of phonological strength which strengthens the stressed vowel and causes it to diphthongize. On the basis of this claim it has been shown that final a is sufficiently strong to prevent diphthongization whereas final u is sufficiently weak to induce it.

At this point, the influence of other final vowels on the stressed, radical vowel needs to be investigated.

Radical Vowel	<u>E</u>	<u>O</u>

Final Vowel		
i †	heri -> ier	no example
e †	leve -> lev	bcve -> bov
o †	no example	octo -> otg

Final Vowel followed by s

us † ²⁷	medius -> mezs	novus -> novs
os †	medios -> mezs	novos -> novs
es †	leves -> levs	boves -> bovs
as †	medias -> mesas	novas -> novas

²⁷ In Sursilvan, the original Latin nominative form is still used for predicative adjectives:
 this is a good man = quei ei in bien un. (bonum, acc.)
 this man is good = quei un ei buns. (bonus, nom.)

Diphthongization seems to be induced in words ending in final i (ier) or y (niev) but not in words ending in e, o, a, es, os, as and us (novs).

Given the two different reflexes novu > niev, but novus > novs, the question arises, how the final y (from Latin -um) could differ from the y in -us. In order to answer this question, other phonological processes need to be considered:

In the Romance vowel shift, all short vowels except a, were lowered one position:

i -> e, e -> E

u -> o, o -> O

But long vowels did not change their quality:

i: -> i, e: -> e

u: -> u, o: -> o, a: -> a

As a result of the Romance vowel shift, short y in -um and in -us and long o in -us should all have changed to o: bonum > bono, bonus > bonos, porcum > porco and porcos > porcos.

In Sursilvan, however, as in all other Romance languages, final (accusative) m was lost (novum > niev_, but novus > novs).

The elision of final m must have changed the preceding original u, for c in porcu assibilated to [tS], whereas the c in porcos did not :

porcc:s -> porc (< porcs), but porcu: -> piertg [piərtS].

Assibilation fails in Sursilvan both before o (ccrnos > corns) and before u (currere > cuorrer), but it applies before front vowels (cera > [tSɛrə]), including i from Latin u: (cura > tgira).

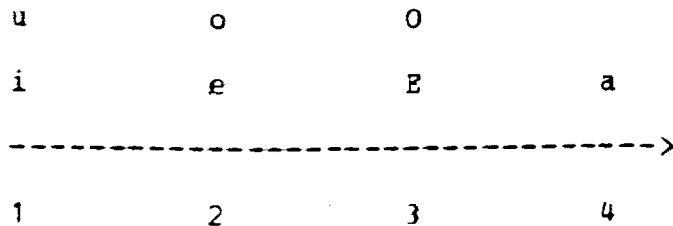
The elision of final m seems to have lengthened the preceding vowel compensatorily, allowing for the Sursilvan change u -> i, which resulted in assibilation in *porci, but not in porcos. The development of final -um and final -us must therefore have had the following form:

novum	novus	
novu:	"	um -> u:
nɔvu	novos	vowelshift
nɔvi	"	ü -> ü -> i

Further evidence for the different development of Latin -um and Latin -us is mentioned by Luedtke who observed the preferential lowering of u before s, but not before m in Old Spanish:

Schon in denjenigen altspanischen Urkunden, welche
 Endsilben -u durch u, -o: durch 0 wiedergeben, finden
 wir die Verbalendung -mus oft als -mos ueberliefert.²⁸

Having established the qualitative difference between u
 (in -um) and u (in -us), the process of polarization is
 calculated as the absolute difference between the phonological
 strength of the radical and the phonological strength of the
 final vowel with reference to the eta parameter:



Latin:

Romance:

Sursilvan:

novum ->	nCVi	0 - i = 3 - 1 = 2	niev
novus ->	nOVos	0 - o = 3 - 2 = 1	novs
novos: s ->	nOVos	0 - o = 3 - 2 = 1	novs
nove ->	nCVe	0 - E = 3 - 3 = 0	nov
nova ->	nCVa	0 - a = 3 - 4 = -1	nova

²⁸ Luedtke, p. 235

Polarization, which strengthens the open mid vowel vowel, and causes it to diphthongize, is induced if the difference between the radical and the final vowel is sufficiently great:

Polarization: $(V') \text{ CX } (V\#) \rightarrow (V') + \text{ CX } (V\#) -$

Condition: where $|V'| - |V\#| \geq 2$

Thus:	nCvi	nOve	nOva	
	nO+vi-	"	"	polarization
	nuovi	"	"	diphthongization
	niev	nov	nova	MR (orthography)

Summary

* In contrast to previous analyses made by philologists, who explained diphthongization now as a result of vowel lengthening in open syllables, now as a result of the assimilatory (raising) influence of a high vowel in final position, the solution proposed within the framework of Theoretical Phonology rests on notions such as the concept of phonological strength, which abstract the behaviour of the linguistic elements from the phonetic surface.

The puzzling variety of language specific conditions on the process of diphthongization, which invariably appear as constellations of the type,

V -> ide

V+ -> D

can be formulated as a universal condition acting on a universal phonological process:

Universal Process: V -> D

Universal Condition: |V| > ■

Spore's mention of the Raetic idioms as 'yet to be explained' reflects not only a lack of interest in less standardized and more marginal languages, but the inability to approach a linguistic phenomenon such as the Romance diphthongization without preconceived notions derived from superficial analyses of language specific manifestations.

Based on phonetic, orthographic and theoretical evidence, the development of Sursilvan open mid vowels before oral consonants has been analyzed as two different, unrelated processes:

1. The anomalous diphthongization of ɛ in closed syllables has been found to be the result of a combination of the stressed vowel and a metathesized vocalized glide generated between two consonants (anaptyxis).

The analysis of the phonetic change ɛ to ia entails three different phonological processes. All of these processes apply preferentially.

- a. Anaptyxis, which has been related to other glide insertions in strong clusters, such as Spanish nokte > *nokyte > noche. Anaptyxis appears to be blocked in muta cum liquida clusters: thus Sursilvan dupla but cuolpa.

Anaptyxis: CC -> CəC

Condition: CC = CXC

- b. Metathesis, which has been found to depend on the phonological strength of the preceding vowel as measured by the combined eta/omega parameter:

Metathesis: VCəC -> VəCC

Condition: |V| > n

Parochial Condition: n = 4 for Sursilvan: a/O/E

- c. Absorption, which makes the added schwa disappear on the surface, again applies preferentially, namely if the preceding vowel is stronger than 4 on the combined eta/omega parameter.

Absorption: Və -> V

Condition: |V| > n

Parochial Condition: n = 5 for Sursilvan: a/O

2. Diphthongization proper which, contrary to the philological assumption, is not a result of vowel raising due to regressive assimilation or metaphony, (metaphony in fact blocks diphthongization in Spanish and Sursilvan), but, as shown in 2.1, a manifestation of phonological strength induced by the preferential weakening of weak vowels in weak position ²⁹, resulting in the polarization of phonological strength between the radical and the final vowel. The condition on polarization has been expressed numerically as a sufficiently great difference between the two vowels under consideration.

Polarization: V CX V -> V+ CX V-
 Universal Condition: |V1| - |V2| ≥ d
 Parochial Condition: d = 2 for Sursilvan

²⁹ Cf. the analysis of apocope in 1.2

IV. Conclusions

The first linguistic description of Sursilvan can be found in Ascoli's "Saggi Ladini" published in 1873. Since then, there have been many more philological descriptions of the Sursilvan language and the phonetic changes which distinguish it from other Romance languages. None of these descriptions, however, evaluated the phonological rules of Sursilvan with reference to universal linguistic processes.

This thesis presents the first principled account of the two most distinct phonological developments of stressed vowels in Sursilvan:

1. The development of prenasal vowels
2. The development of open mid vowels

Although philological descriptions are basically incommensurable with analyses made in a linguistic theory, the philological treatment of Sursilvan vowels is briefly compared to the theoretical analyses and solutions which have been presented in this thesis.

1. Prenasal Changes:

Since philologists are aware of phonetic changes rather than linguistic processes, their description of prenasal reflexes of stressed vowels in Sursilvan remains a list of arbitrary and unrelated phonetic facts interspersed with phonetic pseudoexplanations such as the claim that the velar glide of the prenasal diphthong /aw/ is expected in the environment of a velar nasal:

planka -> plaunka but planta -> plenta

This claim, typical of philological surfacism, is contradicted by the appearance of /aw/ before dental clusters in Engadinian:

planka -> plaunka and planta -> plaunta

In the theoretical analysis presented in chapter two, both prenasal reflexes of stressed a (au and o) have been related to each other by distinguishing two universal processes, diphthongization and contraction.

The business of phonologists is not only to relate superficially disparate phonetic manifestations, but to formulate the conditions under which linguistic processes operate.

Thus, diphthongization and contraction have both been found to be phonological strengthening processes, although, phonetically, they are contrary processes:

Diphthongization of a to au has been shown to apply to strengthened (nasalized) vowels in preference to oral vowels:

~~a~~ → au
a → idem

whereas contrastive configurations revealing the preferential application of contraction, reconfirmed the strength relations predicted by the alpha parameter for the Romance languages:

Velar Nasals:	auŋ → idem
Dental Nasals:	aun → idem
Labial Nasals:	aum → om

The different vocalic reflexes of all Sursilvan vowels before labial and dental nasals could thus be explained coherently as a consequence of a difference in phonological strength between the two nasal consonants (om vs. awn, em vs. eyn, um vs. u:n, em vs. iyŋ).

2. Pseudodiphthongization of E to ia:

One of the few philological comments made about the change of E to ia is Gartner's observation that ia appears "vor starken Konsonantengruppen"¹. Although the observation is correct, Gartner fails to give an explanation.

The theoretical solution, on the other hand is based on an analysis, which reveals that

1. the reflex ia for E and the reflex uo for U can both not be the result of a proper diphthongization (as defined in 3.2).
2. With the exception of muta cum liquida, ia and uo occur exclusively before consonant clusters. Therefore it has been hypothesized that they are the result of the addition of a metathesized anaptyctic schwa.

The theoretical analysis led to an interesting theoretical problem: why is the metathesized anaptyctic schwa only evident on the phonetic surface when the preceding vowel has the strength value of 4 (eta/omega parameter) (E -> ia, U -> uo) ?²

This curious requirement, has been found to be the result of:

¹ p.623, in Groeber, Gustav (ed.) Grundriss der Romanischen Philologie, vol. 1, Strassburg, 1904-1906

² This problem naturally never occurred to philologists which, lacking a theory, had to avoid questions in general.

1. A condition on metathesis:

Metathesis of the anaptyctic schwa occurs if the vowel which attracts the metathesizing element is sufficiently strong:

ferma -> idem |V| = 3

perdere -> piarder |V| = 4

2. The process of absorption:

which causes the added schwa to disappear if adjacent to the strongest vowels a and o.

soarte -> sort |V| = 5

searpe -> siarp |V| = 4

3. Metaphony and the Romance Diphthongization:

Philologists occasionally went beyond mere description and formulated hypotheses such as the open syllable hypothesis and the metaphony hypothesis. Facing contradictory data, however, they either reshaped the data or ignored important evidence: The failure of the open syllable hypothesis to account for diphthongization in Spanish was explained away by claiming that Spanish, although no other Romance language, possessed a syllable structure which allowed for initial it clusters:

Italian: mor % to

but

Spanish: mue % rto

The Sursilvan diphthongization of open mid vowels before final u and i, was explained with reference to the raising influence of final high vowels; the same raising influence, which in Spanish and Sursilvan in fact blocks diphthongization.

In the theoretical analysis on the other hand it was possible to isolate a universal condition on diphthongization which accounts for the constellations found in all the Romance languages:

$$V \rightarrow D$$
$$|V| > m$$

On the basis of this condition, the Sursilvan diphthongization of open mid vowels could be explained in terms of phonological strength.

By relating the blockage of diphthongization in words ending in strong vowels in French, to the induction of diphthongization in words ending in weak vowels in Sursilvan, the Sursilvan diphthongization of open mid vowels has been formulated as the result of a polarization by calculating the difference of the absolute strength of the stressed and the final vowel:

$$V \rightarrow D$$
$$\text{if } |V1| - |V2| > d$$

Despite the countless phonetic variations and phonological rules of natural languages, there exists a limited set of universal phonological processes such as diphthongization, contraction, nasalization, denasalization, insertion, elision, etc.

In Theoretical Phonology, these processes are interpreted as manifestations of phonological strengthening or weakening processes. The two possible directions for a given linguistic element to change are governed and predicted by the Inertial Development Principle: Strong elements strengthen first, weak elements weaken first.

Since this thesis is concerned with the preferential development of Sursilvan vowels in stressed position, i.e. the strongest position in the word, all the analyzed processes have proved to be strengthening processes. But although stressed position may be a sufficient condition for a strengthening process, as is evident in the general diphthongization of open mid vowels in Spanish, all the strengthening processes that have been investigated in this thesis applied preferentially, that is, they are conditioned by specific phonological environments. The diphthongization of low vowels before nasals lana > lawna, b0na > b0wna > buna, bEne > beyn, thus contrasts with the nondiphthongization of low vowels in nonnasal environments ala > ala, n0va > n0va, lEve > lEv, whereas the diphthongization of open mid vowels in words where polarization additionally strengthened the stressed vowel n0+vu- > niev is contrasted by words where polarization failed n0va > iden.

The open mid vowel o, for instance, was therefore subject to two different diphthongizations:

nOvu	bOnu	nOva	bOna	
nievu	bienu	"	"	Diphthongization (1)
"	"	"	bOwna	Diphthongization (2)
niev	bien	nova	buna	MR (orthography)

Despite the fact that the two preferentially applying diphthongizations seem unrelated on the phonetic surface (different reflexes, different time of application), the interpretation of phonological processes as manifestations of strengthening or weakening processes makes it possible to relate the two phonological changes on a more abstract level to one another:

Both diphthongizations are the result of phonological strengthening processes arising from preferentially induced strength imbalances among the phonological elements.

nOvu	bOnu	nOva	bOna	
nO+vu-	bO+nu-	"	"	Strengthening (1)
nievu	bienu	"	"	Diphthongization (1)
"	"	"	bO+nu	Strengthening (2)
"	"	"	bOwnu	Diphthongization (2)
niev	bien	nOva	buna	MR (orthography)

The concept of the preferentiality of linguistic change, as illustrated in this thesis, therefore allows for an understanding and a systemic explanation of linguistic change by revealing a complex, but less complicated, and abstract linguistic reality.

ROMANCE - SURSILVAN DATALIST

Romance	Sursilvan ¹	Phonetic	English
1. au (Latin au)			
auru	aur	[awr]	gold
auca	auca	[awkə]	goose
laudat	lauda	[lawdə]	to praise, 3. sg.
audit	auda	[awdə]	to hear, 3. sg.
2. a (Latin a:, a)			
a) a (_ oral C)			
ala	ala	[alə]	wing
albu	alv	[alf]	white
arat	ara	[arə]	to plough, 3. sg.
facere	far	[fa]	to do
carne	carn	[karn]	meat
lacte	latg	[latS]	milk
sale	sal	[sal]	salt

¹ The data for Sursilvan is from Vieli/Decurtins (1962), the data for all other Romance languages is from Koerting (1922) (Lateinisch-Romanisches Woerterbuch).

Symbolism: O, E, U = open vowels; o, e, u = closed vowels
 S, Z, ny, ly = palatal s, z, n, l; ə = schwa, ng = velar n

b) a (_ nasal C)

(i) a -> au (_ ng)

anque	aunk	[awngk]	as well
angelu	aunghel	[awnggə1]	angel
planca	plaunka	[plawngkə]	slope
banca	baunca	[bawngkə]	bank
mankat	maunka	[mawngkə]	to lack, 3.sg.
sangue	saung	[sawng]	blood

(ii) a -> au (_ n)

planu	plaun	[plawn]	flat
manu	maun	[mawn]	hand
sanu	saun	[sawn]	healthy, m.sg.
granu	graun	[grawn]	corn
pane	paun	[pawn]	bread
cane	tgaun	[tSawn]	dog
laña	launa	[lawnə]	wool

(iii) a -> o (_ n C)

annu	onn	[On]	year
dannu	donn	[dOn]	damage
grande	grond	[grOn]	big

amita	onda	[Onda]	aunt
infante	aifon	[afOn]	child
tantu	tcn	[tOn]	a lot, m.
tanta	tonta	[tOntə]	a lot, f.
cantat	ccnta	[kOntə]	to sing, 3.sg.
planta	plqnta	[plOntə]	plant
romanicu	romontsch	[romOntS]	romansh, m. sg.
cania	cogna	[kOnyə]	bitch
montanea	muntcgrā	[muntOnyə]	mountain
calcaneu	calcogn	[kəlkOny]	heel
sanctu	scgn	[sOny]	holy, m. sg.
manica	mcngia	[mOnydZə]	handle

(iv) a -> o (_ ■)

fame	fon	[fOn]	hunger
ramu	ron	[rOn]	branch
clamat	cloma	[klOmə]	to shout, 3.sg.
lama	loma	[lOmə]	soft, f. sg.
aeramen	iron	[irOn]	copper
flamma	flomma	[flOmə]	flame
camera	ccmbra	[kOmbrə]	room
canba	comba	[kOmbə]	leg

3. 0 , o

a) 0 (Latin o)

(i) 0 -> idem (_ CX [e,o,a,us,es,os,as] #)

cOr	cor	[kOr]	heart
nOve	nov	[nOf]	nine
sOrte	scrt	[sOrt]	fate
sOrtes	sorts	[sOrts]	fate,pl.
pOllice	polisch	[pOlis]	thumb
Octo	otg	[OtS]	eight
nOvus	novs	[nOfs]	new,m.sg.nom.
grOssus	gross	[grOs]	big,m.sg.nom.
mOrtus	morts	[mOrts]	dead,m.sg.nom.
nOvos	novs	[nOfs]	new,m.pl.
grOssos	gross	[grOs]	big,m.pl.
mOrtos	morts	[mOrts]	dead,m.pl.
nOvas	novas	[nOv@s]	new,fem.pl.
grOssas	grossas	[grOss@s]	big,fem.pl.
mOrta	morta	[mOrt@]	dead,fem.sg.
pOrta	porta	[pOrt@]	door
rOta	roda	[rOd@]	wheel

(ii) o -> iə (_ CX u #)

Ovu	iev	[iəf]	egg
nOvu	niev	[niəf]	new, m. sg.
grOssu	gries	[griəs]	big, m. sg.
mOrtu	miert	[miərt]	dead, m. sg.
bOnu	bien	[biən]	good, m. sg.
sOmnu	sien	[siən]	sleep
sOmniu	sieni	[siəni]	dream
pOpulu	pievel	[piəvəl]	people

b) o (Latin o:, u)

(i) o -> u: (_ %)

cruce	crusch	[kruS]	cross
voce	vusch	[vuS]	voice
flore	flur	[flur]	flower
colore	cclur	[kukur]	color
nodu	nuv	[nuf]	knot
coda	cua	[kuə]	tail
lupu	luf	[luf]	wolf
pastore	pastur	[pəStur]	shepherd
excutere	scuder	[Skudər]	to thrash

(ii) o -> U (_ % CC)

bucca	bucca	[bʊkə]	mouth
cuppa	cuppa	[cʊpə]	cup
dupla	dubla	[dʊblə]	double, f. sg.
crusta	crusta	[krʊstə]	crust
ruptu	rut	[rʊt]	broken, m. sg.
tottu	tut	[tʊt]	whole, m. sg.

(iii) o -> Uə (_ CXC)

turre	tuor	[tʊər]	tower
currere	cuorer	[kʊərər]	to run
curtu	cuort	[kʊərt]	short, m. sg.
curte	cuort	[kʊərt]	court
sardu	sucrd	[sʊərd]	deaf, m. sg.
turnat	tuorn	[tʊərnə]	to turn, 3. sg.
urso	uors	[ʊərs]	bear
culpa	cuolpa	[kʊəlpə]	guilt

c) 0, o (_ nasal C)

(i) {0,o} -> u: (_ n)

b0na	buna	[bunə]	good, f. sg.
b0nos	buns	[buns]	good, m. pl.
ratione	raschun	[rəSun]	reason
sabulone	sablun	[səblun]	sand
sapone	savun	[səvun]	soap

(ii) {0,o} -> U (_ n)

c0na	cuna	[kUnə]	hair
d0mina	dunna	[dUnnə]	woman
h0mo	un	[Un]	man
nomen	nun	[nUn]	name
ponu	pun	[pUn]	fruit
autumnu	atun	[ətUn]	fall

3. E, e

a) E (Latin e)

(i) E -> idem (_ C)

mEl	mel	[mEl]	honey
lEve	lev	[lEf]	light
mEtere	meder	[mEdər]	to now
vEtere	veder	[vEdər]	old, n. sg.
lEgere	leger	[lEdzər]	to read
cEra	tschera	[tSErə]	wax
Erat	era	[Erə]	to be, 3. sg.
sEcat	sega	[sEgə]	to cut, 3. sg.
lEvat	leva	[lEvə]	to raise, 3. sg.
gElat	gela	[dZElə]	to freeze, 3. sg.
pEtra	pedra	[pEdrə]	jewel
fEbra	fehtra	[fEbrə]	fever

(ii) E -> ya (_ CXC)

fErros	fiars	[fyars]	irons
vErbos	viarvs	[vyarfs]	words
nErvos	niarvs	[nyarfs]	nerves
tErra	tiara	[tyarə]	earth
bElla	biala	[byalə]	beautiful, f. sg.
pElle	pial	[pyal]	skin
pErdere	piarder	[pyardər]	to lose
hErba	iarva	[yarvə]	grass
fESta	fiasta	[fyaStə]	feast
sEpte	siat	[syat]	seven

(iii) E -> iə (_ CX {i,u} #)

hEri	ier	[iər]	yesterday
caelu	tschiel	[tʃiəl]	sky
cEntu	tschien	[tʃiən]	hundred
gEneru	schieder	[ʃiəndər]	brother in law
fErru	fier	[fiər]	iron
nEdu	niedz	[niəts]	half, m. sg.
vErbu	vierv	[viərf]	word
nErvu	nierv	[niərf]	nerve
infErnu	uffiern	[ufiərn]	hell

b) e (Latin e:, i)

(i) e -> ey (_ %)

site	seit	[seyt]	thirst
seta	seida	[seydø]	silk
nive	neiv	[neyf]	snow
fide	fei	[fey]	trust
pilu	peil	[peyl]	hair
cena	tscheina	[tseyndø]	meal
candela	candeila	[candeylø]	candle

(ii) e -> E (_ CC)

firmu	ferm	[fErn]	firm, m. sg.
friscu	frestg	[frESTs]	fresh, m. sg.
pisce	pesch	[pES]	fish
viride	verd	[vErð]	green, m. sg.
siccu	sec	[sEk]	dry, m. sg.
mittere	metter	[mEtø]	to put
crista	cresta	[krESTø]	comb

c) E, e (_ nasal C)

(i) {E, e} -> ey (_ n)

bEne	bein	[beyn]	well
plenu	plein	[pleyn]	full, n.sg.
fenu	fein	[feyn]	hay
veranEte	veramein	[ver@meyn]	really

(ii) {E, e} -> E (_ n)

femina	fenna	[fEnn@]	woman
semita	senda	[sEnd@]	path
sEmen	sea	[sE@]	semen
mEbra	membra	[mEbr@]	members

5. i, u (Latin i:,u:)

a) i, u (_ oral C)

(i) {i,u} -> i: (_ %)

amicu	amitg	[@mitS]	friend
acutu	git	[tSit]	sharp, m. sg.
filu	fil	[fil]	string
duru	dir	[dir]	hard, m. sg.
uru	mir	[mir]	wall
scribere	scriver	[Skrivər]	to write
dicere	di	[di]	to say

(ii) {i,u} -> e (_ CC)

triste	trest	[treSt]	sad
dictu	detg	[dets]	said
fictu	fetg	[fets]	very
fructu	fretg	[fretS]	fruit

b) i, u (_ nasal C)

(i) {i,u} -> i: (_ n)

farina	frina	[frinə]	flower
luna	glina	[lyinə]	moon
molinu	mulin	[mulin]	mill
unu	in	[in]	indef.art.m.
vinu	vin	[vin]	wine

(ii) {i,u} -> e (_ n)

pluma	plena	[plenə]	feather
pruna	prema	[prenə]	plums
fumu	fem	[fem]	smoke
lina	lena	[lenə]	file
simia	schemia	[senyə]	monkey
inprimu	ampren	[əmpren]	first

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