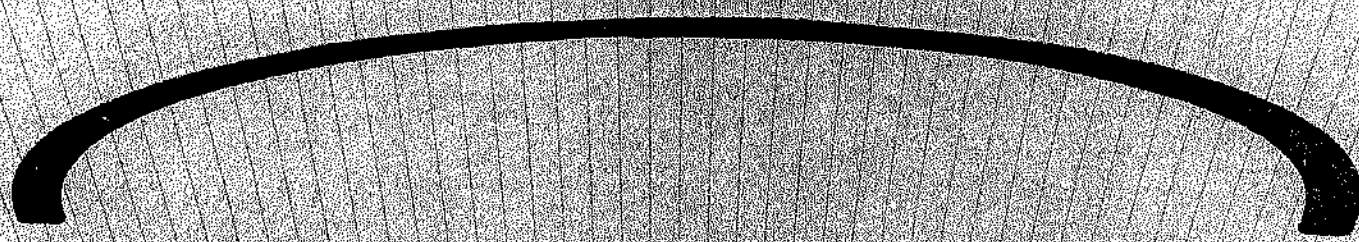# CATALAN PHONOLOGY

and the phonological cycle

JOAN MASCARÓ

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ABSTRACT

The analysis of the phonological structure of Catalan leads to a reexamination of the Phonological cycle, and a more general and precise formulation, which centers on the notion "proper cyclic application" is proposed. Cyclic rules are allowed to apply only if their structural description makes use of specific information introduced by virtue of its cycle. This formulation is shown to cover correctly the earlier versions of the Strict Cycle Condition and the Alternation Condition (Chomsky 1973, Kean 1974, Kiparsky 1974), as well as other phenomena of Catalan. A characterization of cyclic rules as obligatory neutralization rules is proposed also. These results are presented in the Introduction. Chapter 1 deals with stress rules and other stress-related phenomena. The interaction between stress rules modifying underlying stress patterns and other rules is shown to be cyclic in the sense proposed. Further support for the Phonological Cycle is drawn from the analysis of consonantal phenomena that are discussed in Chapter 2. In Chapter 3 the analysis of the accentual system presented in Chapter 1 is carried over the verbal system and some consequences are discussed.

PREFACE

The present work deals with some phonological aspects of Catalan and their theoretical consequences. In Chapter 1 I examine the stress pattern and vowel alternations, Chapter 2 deals with consonantal phenomena, and Chapter 3 is an analysis of the verb morphology. The main theoretical results are presented in the Introduction, which repeats discussion in Chapter 1. I have used the dialectal variety of Catalan spoken in Barcelona as the source for my data. I don't indicate in my transcriptions some phonetic distinctions that are not relevant, like the stop and fricative allophones of b, d, g, minor assimilations that don't bear on the discussion, or in some cases the distribution of r and $\bar{r}$ discussed in Chapter 2. Most divergences from Standard Catalan regard the verbal morphology. The reader can find some information about Catalan Phonology in Fabra (1912), Badia (1951), Alcover and Moll (1930) and other references in the Bibliography. A very good source is also the extensive and careful analysis within the generative framework of Wheeler (1974), which is more "standard", both in the variety of Catalan described, and in the framework he adopts.

I am indebted to many people who have contributed to the present work with their criticisms and comments. I would like to thank especially Morris Halle, Noam Chomsky and Paul Kiparsky, with whom I have discussed all the material in this work and who have contributed with many valuable comments, criticisms and ideas.

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INTRODUCTION

Twenty years ago, Chomsky, Halle and Lukoff (1956) proposed a convention on rule application by which rules "apply no more than once to each constituent, applying a rule to a constituent of order n only after having applied it to all constituents of order $n+1$; i.e. beginning with the smallest constituents and proceeding to larger and larger constituents" (p. 75). Since then, this convention, known as the Cycle, has been applied to numerous languages and some modifications have been proposed. In the present work I shall offer evidence from Catalan in favor of a notion "phonological cycle" that covers some of the proposed modifications, as well as other theoretical proposals not connected with the cycle, and other empirical material.

Cyclic application can be formulated as follows:

(1) Given a bracketed expression $[_n...[_{n-1}..., [_1...]_1,$
     $...]_{n-1}...]_n$, and a (partially ordered) set of cyclic rules C,

A. C applies to the domain $[_j...]_j$ after having applied to the domain $[_{j-1}...]_{j-1}$, each rule in C applying in the given order whenever it applies properly in j.

B. <u>Proper application of cyclic rules</u>. For a cyclic rule to apply properly in any given cycle j, it must make specific use of information proper to (i.e. introduced by virtue of) cycle j.

Thus the set of cyclic rules applies to the string enclosed in the innermost pairs of brackets, then moves to the second cycle, and so on until the outermost constituent is reached. Within each cycle, each rule has a chance to apply in the given order if it makes specific use of information proper to this cycle (1B.). This condition ensures that no "improper" cyclic application, that is, multiple application of a rule, opposite rule ordering, etc., on the same cycle results. In other words, it makes it impossible for rules to "return to earlier stages of the cycle after the derivation has moved to larger, more inclusive domains" (Chomsky 1973, 243), which would decisively reduce the empirical content of the cycle. (1B) covers in part, and is in fact a more general formulation

of the basic idea of the Strict Cycle Condition (or Strict Cycle, or Strict Cyclicity), which in turn should form part, as pointed out before, of any meaningful notion of the cycle. The Strict Cycle Condition was proposed in Chomsky (1973) for syntax,[1] and Kean (1974) for phonology. Although (1B) is just part of the definition of "phonological cycle" I shall continue to refer to it as the Strict Cycle Condition (SCC) for convenience.

Before examining several cases where the phonological Cycle makes crucial predictions, let's consider an example that illustrates its operation. Three cyclic rules that will be motivated in the first chapter interact in the derivation of the Catalan phrase /prudúírá## óksidásyó/ 'it will produce oxydation'. Destressing (24) removes all but the rightmost stress within a word, Glide Formation (36) forms glides from unstressed high vowels after another vowel, and Vowel Reduction (49) reduces unstressed vowels, ɔ, e.g., going to u. More detailed discussion of the derivation can be found in section 9 of Chapter 1, (62).

(2)   [[[[prudú]í]rá]   [[[óksid]á]syó]]

GL. FOR.		
DESTRESS.	u	ɔ
VOW. RED.		u
GL. FOR.		
DESTRESS.	i	a
VOW. RED.		ə
GL. FOR.		w
DESTRESS.		
VOW. RED.		

pruduíráwksidəsyó

We can distinguish three different cases under which a cyclic rule might meet condition (1B), the SCC. Each one is a sufficient condition for a rule to apply properly in any given cycle. Correspondingly, when none of the cases is met the SCC blocks the rule (i.e. the rule cannot apply properly on the given cycle).

(3) A cyclic rule R applies properly on cycle j if either a, b or c is met:

a. R makes specific use of information uniquely in cycle j. That is, it refers specifically to some A in $[_j XAY[_{j-1}...]Z]$ or $[_j Z [_{j-1}...]XAY]$.

b. R makes specific use of information within different constituents of the previous cycle which can-

not be referred to simultaneously until cycle

j. R refers thus to some A, B in $[_j X [_{j-1} \cdots$
A....] Y $[_{j-1} \cdots B \cdots] Z_j]$.

c. R makes specific use of information assigned

on cycle j by a rule applying before R.

(3a) is Strict Cyclicity as it appears in Kean (1974). She proposes that "on any cycle A no cyclic rule may apply to material within a previous cycle B without making crucial use of material uniquely in A" (p. 179). Notice that Kean's version is stronger than (3) in a sense, since it blocks application of a cyclic rule even if cases (3b) or (3c) are met.

Thus counterexamples to her proposal are cases of rules that apply when (3b) or (3c) obtain, and counterexamples to the version proposed here would be cases that fall under (3b) or (3c) where application of a rule is blocked. Cases that fall under (3a) constitute evidence for (or against, if the rules should be blocked) both versions.

Let us first examine the cases where a rule is allowed to apply in each of the three cases in (3), and then consider the cases where it is blocked.

Application of cyclic rules under (3a) can be illustrated with [lə#yntimitát] 'the intimacy' and [ái] 'high' (/áit/). Cluster Simplification, which will be presented in Chapter 2, section 6, has as one of its effects the deletion of t in the context i_##. I assume the lexical root is a cyclic node:

(4)   [#lə[#[íntim]itát#]#]   [#[#áit#]#]

GL. FOR. DESTRESS.	———		
	i	Ø	CLUST. SIMP.
GL. FOR. DESTRESS.	y		
	———		

Underlying forms should be as in (4), since we have [íntim] 'intimate' and [áltə] 'high' (fem.); see Chapter 1 for details concerning underlying stress. Both the a (ə after Vowel Reduction) in the first example and one # in the second are made reference to by the corresponding rules, and are uniquely within the domain of the outermost cycle.

Other similar examples can be found in this work and in other cyclic accounts of phenomena in other languages as well.

Condition (3b) can be illustrated with the compound *franco-italià* 'Franco-Italian'. Its members are pronounced in isolation [fráŋku], [itəlyá], but the compound is [fráŋkuytəlyá] (irrelevant constituent structure and boundaries omitted):

(5)   [[fráŋku] [itəlyá]]

    GL. FOR.   y

When the last cycle is reached, all the crucial information for Glide Formation, i.e. the sequence *ui*, is within the previous cycle, but the rule can refer to both *u* and *i* only as a result of the last cycle. Notice that (3b) is also involved in our previous derivation (2), in the last cycle.

(3c) asserts that a cyclic rule applies properly on a given cycle if it is fed (in the sense of Kiparsky 1968, 196, 197) by a rule that has applied on the same cycle. The rules of Vowel Reduction (Chapter 1, (49)) have the effect of converting unstressed vowels *a*, *ε*, *e* to *ə* and *ɔ*, *o* to *u*. The rule of Destressing mentioned before will supply specific information which is crucial for Vowel Reduction. Thus according to (3c), Vowel Reduction should apply even if the vowel is within an inner cycle. And in fact from [plát] 'dish' we get [plətét] 'small dish' and from [dirəktóri] 'directory', [dirəkturiál] 'directorial':

(6)   [#[plát]ɛ́t#]   [[[dirəktór]i]ál]

    (last cycle)
    DESTRESS.   a   ɔ
    VOW. RED.   ə   u

So far I have presented evidence that favors the notion "phonological cycle" presented in (1), but that would be consistent with a weaker formulation (e.g. the extremely weak version (1) without the requirement of proper application). This is so because all the cases discussed involved rules that WERE ALLOWED to apply. In order to show that the condition on applicability of cyclic rules should be as strong as (1), we should present evidence that supports the cases of blocking of cyclic rules predicted by (1).

Before proceeding, recall that the kind of evidence presented disfavors Kean's earlier version of the SCC since it allows rules to apply that violate (3a) but fall under either (3b) or (3c). It might be therefore useful to check the status of the evidence presented there and in other works based on it, and compare it to (1). As was pointed out above, counterexamples to (1) would be cases that fall under (3b) or (3c) and where a cyclic rule is blocked. Interestingly

enough none of the cases presented known to me (Kean 1974, Wilkinson 1974, Halle 1973a and Halle 1973b) fall in this category. That is, they all fall under (3a) and are therefore correctly included in our version of the SCC. Consider for example one of the crucial derivations for Klamath in Kean (1974):

(7)   (47a)   [#nt'iw[#otn[#el'g+a#]#]#]

VOW. RED. (21)	otn	əl'g a
VOW. DEL. (18)	otn	l'g a
SON. CLUST. (40)	otən	l'g a

VOW. RED.	nt'iw	ətən	l'g a
VOW. DEL.	nt'iw	tən	l'g a
SON. CLUST.	(not applicable)		

(Sonorant Cluster (40) $\emptyset \rightarrow \mathit{ə}$ / [#XC __ $\begin{bmatrix} -syll \\ +son \end{bmatrix}$ (CZ)#]). The string is analyzed by Sonorant Cluster in the third cycle as

(8)   [#nt'iw[#tən[#l'g a#]#]#]

$$[\# \underbrace{\qquad}_{X} C\emptyset \;.\; C \underbrace{\qquad}_{Z}]$$
$$\begin{bmatrix} -syll \\ +son \end{bmatrix}$$

and no specific (i.e. nonvariable) material used by the rule is either uniquely in the third cycle, or is proper to that cycle in the sense of (1B) or (3).

Thus the evidence presented for the earlier version of the SCC is consistent with, and favors, the version proposed here.

Let us now turn to some of the evidence presented in the present work where a cyclic rule is blocked by (1), because it doesn't apply properly on a given cycle. In order for a rule not to apply properly on some cycle none of the three conditions in (3) should be met, since each one is sufficient for proper application.

Notice that (3a) predicts that no rule applies to innermost constituents. (3b) cannot be met obviously in that case, and for (3c), a rule should have applied first, but this rule itself would be subject to (3c), and so on. (3a) requires that there be some A referred to by the rule in $[_j XAY[_{j-1} \ldots]Z]$ or $[_j Z[_{j-1} \ldots]XAY]$, which cannot be the case for innermost constituents. I shall call the domain of innermost constituent the 0th cycle and first cycle the smallest constituent that contains the 0th cycle, that is, the domain to which cyclic rules apply first.

Consider the following derivation, which involves [[[triómf]ál]ízm] 'triumphalism' (cf. [triómf] 'triumph', [triumfál] 'triumphal').

(9) $[_2[_1[_0 triómf]_0 ál]_1 ízm]_2$

1st	
GL. FOR.	--
DESTRESS.	o
VDW. RED.	u

2nd		
GL. FOR.	SCC	
DESTRESS.	a	
VDW. RED.	ə	
(ə-Ins.)		ə

[triumfəlízmə]

On the first cycle (cycle 1) Glide Formation can't apply because the _o_ hasn't been reduced nor destressed. Destressing can apply by (3a) because it uses specifically the stressed vowel outside the Oth cycle. Vowel Reduction applies then by (3c) since a previous rule, Destressing, has introduced the crucial information removing the stress on the _o_. On the second cycle the S.D. of Glide Formation is met, but its application would be improper. The sequence _iu_ is wholly within a previous cycle, and conditions (3b) and (3c) don't apply, obviously. Therefore SCC blocks it. Finally Destressing and Vowel Reduction apply again, meeting (3) as in the first cycle and ə is inserted word-finally (by rule (11), Chapter 3).

Another interesting example is provided by words ending in suffixes that shift the stress to the preceding syllable, like _i_, _ik_, or _grəf_ ([futógrəf] 'photographer', [fótu] 'photo', [sifilítik] 'syphilitic', [sífilis] 'syphilis', etc.). Whenever one of these suffixes occurs, the preceding stressed vowel can be _a_, _ɛ_, _i_, _ɔ_, _u_, but never _e_ or _o_. Furthermore there are alternations like [numéru] 'I enumerate' ~[numérik] 'numerical', [əsférə] 'sphere' ~[əsférik] 'spherical', [direktó(r)] 'director' ~[direktóri] 'directory', etc. A rule with the effect _é_ → _ɛ_ and _ó_ → _ɔ_ would handle these cases. The rule doesn't apply when no prestressed suffix is present as the preceding alternations show. On the other hand, a separate rule is needed that stresses the vowel before a prestressed suffix. Saying that this rule, and the _é_ → _ɛ_, _ó_ → _ɔ_ rule both apply before some specific set of suffixes would amount to stating the same idiosyncratic environment twice. One could also say that the vowel change takes place if the stress has been assigned to it by the other rule, introducing global conditions. Both solutions are undesirable. Now consider what is predicted by (1) if both rules are cyclic. The alternating pair [séntri] 'he centers' (subj.) ~[séntrik] 'centric' will have the common root morpheme /séntr/

and the (unstressed) subjunctive morpheme /í/, and the (prestressed) morpheme /ik/.

(10)   [[séntr]í]   [[séntr]ik]

IC-RULE   --   é
é → ę   --   ę̨

On the 0th cycle no rule applies. On the 1st cycle the IC-Rule applies in the second example stressing the é. Now é → ę̨ will be able to apply in this case by condition (3c) since a previous rule assigned specific information required by the rule in question. This is not the case in the first example, and the SCC will block application of the second rule. (10) also shows that for a cyclic application to be proper it is sufficient that a rule on the same cycle assign information specifically required by the rule, regardless of whether or not this information was already present on previous cycles.

The formulation of the phonological cycle in (1) thus covers the evidence for Strict Cyclicity, as well as other empirical phenomena. Yet there is another interesting consequence of this revision of the SCC. Kiparsky (1974) proposed a condition on application of phonological rules by which

(11)   (ALTERNATION CONOITION)

Neutralization processes apply only to derived forms. . . [A] neutralization process can apply only if the input involves crucially a sequence which arises in morpheme combinations or through the application of phonological processes. (p. 65) . . .[the Alternation Condition] must be restricted to obligatory rules. (p. 85)

As I shall show, the Alternation Condition is in fact covered by the SCC, and the numerous pieces of evidence brought forward in Kiparsky (1974) apply equally to it. To make the notion "derived" in (11) clearer and show its connection with the notion "proper cyclic application" in (1) and (3), let's consider the Finnish examples in Kiparsky (1974). Rule (12) (=(2-1)) applies in (13a) and (13b) but not in (13c):

(12) $t \rightarrow s$ / ___ i

(13)   a.   across morpheme boundary (e.g. /halut+i/ → *halusi*)--
            $t \rightarrow s$ applies;

       b.   morpheme-internally, with derived i (e.g. /kante/ → *kansi*)--$t \rightarrow s$ applies;

       c.   morpheme-internally, with underlying i (e.g. /koti/ → *koti*)--$t \rightarrow s$ does not apply.

(13a), [[halut]i] in our terms, allows (12) to apply by (3a), since the rule crucially mentions material uniquely on the outer cycle. (13b) is a case covered by (3c), because a rule $e \rightarrow i$ applying on the outer cycle introduces information which is crucial for (12). On the other hand, in [koti], no rule applies on the 0th cycle, and on later cycles either, since (12) involves only the sequence ti within the 0th cycle.

There still are two main differences between the Alternation Condition and the part of the Phonological Cycle that covers it. First, the SCC applies only to cyclic rules; secondly, the Alternation Condition applies only to obligatory neutralization rules. There are several possible ways of avoiding this problem; we could, e.g., modify the SCC, or keep it unchanged and change the predictions of the Alternation Condition. Although much has to be done in this domain, I shall take the strongest position, namely that all and only obligatory neutralization rules are cyclic.[2]

Before returning to this proposal, it will be appropriate to discuss some methodological questions. It should be clear that there is no a priori reason to prefer a theory with cyclic grammar to a theory with noncyclic grammars (or, correspondingly, with cyclic or noncyclic components). A change from cyclic to noncyclic, or vice-versa, changes the class of languages generated but does nothing at all to the class of grammars. Hence no question of restrictiveness can be raised. On the other hand, a theory which allows rules (in general or in a given component in the grammar) to be cyclic or noncyclic language particularly defines a much larger set of possible grammars, and is thus a priori less preferable to a theory with cyclic rules, a theory with noncyclic rules, or a theory which gives some universal criterion for distinguishing cyclic from noncyclic rules.

All this does not mean that questions of restrictiveness can't be posed a posteriori in connection with cyclicity. It might very well be argued for example, that in order to account for some data, changing from a cyclic to a noncyclic theory forces us to resort to some mechanism that in fact increases the class of grammars. That was the case with the discussion of (10) where the Phonological Cycle made global rules unnecessary.

Returning to the takeover of the Alternation Condition by the SCC, it is clear that the solution proposed, restricting cyclic rules to a particular type of rules narrows the class of grammars in the desired way. The evidence presented in Kiparsky (1974) in favor of the Alternation Condition, can be easily reanalyzed cyclically, as far as I can see, although a cyclic alternative was not considered there and a reexamination of the examples would be in order. The data of Catalan covered in the present work, on the other hand, favor the proposal. The twenty-two rules presented have the following characteristics (I indicate in parentheses the number of the rule

and the section where the argument for or against cyclicity appears; Roman numerals refer to the number of the chapter).

Six rules are neutralizing and obligatory, and can apply either cyclically or noncyclically, as far as I can see (IC-Rule (I, section 4), N-Deletion (II-46), R-Deletion (II-5D), B to W (II-56), 1st and 2nd ə-Insertion (III-10, 11). The other eight obligatory and neutralizing rules have to be cyclic (Destressing (I-24) I.8, Glide Formation (I-36), I.8, I.9, Vowel Reduction (I-49) I.8, I.9, Major Assimilation of Nasals (II-36) II.7, Cluster Simplification (II-28) II.7, Assimilation of Continuants (II-10) II.5, Contraction (II-23) II.5, D-Insertion (III-14) III.3). Of these rules, only the last is cyclic just because it obeys the part of the SCC covered by the Alternation Condition and could be covered by it alone. Finally, the remaining rules are optional or non-neutralizing. Neither can be cyclic because the SCC would wrongly prevent application (Assimilation of Stops (II-7) II.2, Assimilation of Labial Stops (II-8) II.2, Minor Nasal Adjustment, (II-39), II.7, G to ŋ (II-9) II.2, Assimilation of Laterals (II-12) II.7, Final R (II-17) III.4, Initial R (II-18) III.4).

Footnotes

[1]Although the present formulation of the cycle was intended for Phonology, it is interesting that all the arguments presented in 8ach and Horn (1976) against the formulation of SCC in Chomsky (1973) are covered by the present version. All the examples involve a rule operating on the outer cycle that introduces specific information used by a later rule that operates within the domain of the previous cycle.

[2]Other proposals to characterize the class of cyclic rules have been made in Brame (1972) and Brame (1974).

CHAPTER ONE: THE ACCENTUAL SYSTEM

1. Introduction

The most superficial observation about Catalan stress is that words are either unstressed, or else stressed on one of the last three syllables. To take the simplest cases, consider a few mono-morphemic words with no or zero flexion marks.

(1)
u	'it'	ú	'(letter) u'
pəpá	'dad'	pápə	'pope'
mərít	'husband'	mérit	'merit'
putási	'potassium'	prótəzi	'protasis'
difísil	'difficult'	défisit	'deficit'

Although oxytones are more common than paroxytones, and proparoxy-tones are least common, there is no clear correlation between place of stress or any other general property of morphemes.[1] There are, of course, some obvious observations to be made. Items belonging to major lexical categories (nouns, adjectives, verbs and adverbs) are always stressed. Monosyllabic words cannot be proparoxytone. Polymorphemic words show only one stress on the surface, the position being determined by the inherent properties of their constituent morphemes.

Affixes might be divided into three types, STRESSED, UNSTRESSED, and PRESTRESSED. UNSTRESSED AFFIXES don't affect the stress of the stem and, of course, show up unstressed on the surface. STRESSED PRE-FIXES don't show any stress on themselves, nor do they affect the stress on the stem, but their stress is needed, since it has an effect upon other phonological processes that will be discussed later. STRESSED SUFFIXES show stress on the surface (provided no other stressed suffix follows, in which case it gets stressed) and cause the stem (and any preceding stressed suffix) to lose its stress. Finally, PRE-STRESSED SUFFIXES show no stress on themselves, but cause the stress of the stem to be positioned on its last syllable, i.e. the one preceding the suffix. Here are some examples:

(2) Unstressed

in-, -ə innúmərə (root, númər) 'countless' (fem.)
dəz-, -i dəzgásti (root, gást) 'he wears away' (subjunctive)

Stressed

-ál numərál 'numeral'
-mál-, -á malgəstá 'to waste'

Prestressed

-ik numérik 'numerical'

Most inflectional suffixes are unstressed. Thus the feminine mark-
er ə, the masculine marker u and most verbal suffixes don't bear or
affect stress. A few verbal flexion markers, however, are stressed.
The same is true of most derivational suffixes. Some of them belong
to the class of prestressed suffixes, like ik. Prefixes never affect
the stress of the stem, and can be unstressed or stressed.

So far we just have a rather simple outline of stress patterns in
Catalan. Nonetheless we can begin to make some assumptions about the
general characteristics of stress assignment, i.e., of the formal
devices that will account for stress in Catalan. I will discuss two
basic types of treatments. They can be distinguished by the presence
or absence of prosodic (in particular, stress) features in underlying
representations. So in the first type, stress is assigned to words
solely by rule, in terms of segmental, morphological and syntactic
properties of strings. This is the kind of analysis developed in
Chomsky and Halle (1968) and in numerous subsequent work based on it.
Under the second type of treatment, stress is predicted on the basis
of both phonological rules and underlying prosodic properties of
lexical items. To give a somewhat more external characterization of
the two approaches, the basic idea or guiding hypothesis in the first
one is that, since stress is discovered to be largely predictable,
finding the correct stress assignment rules will simplify underlying
representations to the point of getting rid of prosodic information
in the lexicon. The second solution, on the other hand, argues that
prosodic information in the lexicon and a reduction of phonological
rules and diacritic features is the right answer. Needless to say--
yet important to remember--that the question of grammar simplicity,
and a fortiori the question of relative simplicity of different parts
in the grammar, is empirical. In other words, we should determine
which of the solutions is empirically supported, and construct the
formalism so that the other solution is either excluded or less
highly valued. This does not mean, of course, that questions of
restrictiveness--as distinct from questions of simplicity--cannot
be raised.

In the next section, I shall present an analysis of the first
type, where stress is assigned by two rules. In section 3 some in-
adequacies of the analysis will be pointed out, and in section 4 an
alternative that belongs to the second type will be proposed.

2. Stress Assigned by Rule

An example of "standard" treatment is the detailed analysis by
Wheeler (1974), chapter II and 129-131, 310-311. It also has the
merit of being part of a work dealing with other phenomena relevant
to stress, so that the solution reached has rather considerable moti-
vation, given the framework.

I will first discuss the MAJOR STRESS RULE and the MINOR STRESS RULE, and then deal with two sets of verbal forms that require special comment.

Stress is assigned by two rules, the Major Stress Rule and the Minor Stress Rule (MSR and Minor SR henceforth). Lexical items are marked either [+E], or [-E]. Items marked [+E] are redundantly marked [-Major Stress Rule]. The diacritic feature [±E] is thus used to distinguish two basic nonpredictable stress patterns. Let's consider the MSR first:

$$(3) \quad [+syll] \rightarrow [+stress] \; / \; [X\underline{\quad}C_0 \; ([+segm]) < \left(\begin{bmatrix} +syll \\ +hi \end{bmatrix} + V\right) >$$

$$(+ \begin{bmatrix} -vocal \\ +coron \\ -distr \end{bmatrix})\#]_{<N,A>}$$

To begin with, in no case can the MSR apply in expansions with both [+segm] and $\begin{bmatrix} +syll \\ +high \end{bmatrix}$ + V when [+seg] = V, since there are no under-lying VVV sequences (if [+seg] = C then C_0 ([+seg]) is equivalent to C_0). The other expansions with some characterized examples, are the following:

(4) a. $\underline{\quad}C_0 \begin{bmatrix} +syll \\ +high \end{bmatrix} + V + \begin{bmatrix} -vocal \\ +coron \\ -distr \end{bmatrix} \#]_{N,A}$ kərísi+ə+s 'caresses' PROPAROXYTONES in i+ə, u+ə

b. $\underline{\quad}C_0 \begin{bmatrix} +syll \\ +high \end{bmatrix} + V \#]_{N,A}$ kərísi+ə 'caress'

c. $\underline{\quad}C_0$ [+segm] mərtíri+s 'torments' imít+ə+n 'they imitate' PAROXYTONES in -C #

   $+ \begin{bmatrix} -vocal \\ +coronal \\ -distr \end{bmatrix} \#]$ əntík+s 'ancient' (pl.) əskúp+s 'you spit' OXYTONES in C+C #

d. $\underline{\quad}C_0$ [+segm] #] mərtíri 'torment' imít+u 'I imitate' PAROXYTONES in V #

   əntík 'ancient' (sg.) əskúp 'he spits' OXYTONES in C #

e. $\underline{\quad}C_0 + \begin{bmatrix} -vocal \\ +coron \\ -distr \end{bmatrix} \#]$ already covered by d.

f. __C_0 #]   té   tá   MONOSYLLABLES in
                  'tea'   'he does'   V #

The final $\begin{bmatrix} -vocal \\ +coron \\ -distr \end{bmatrix}$, which covers s and n, stands for the plural

marker s and 3rd person plural marker n. The two other morphemes con-
sisting of a single consonant are m and w, the 1st and 2nd person plur-
al markers. Being excluded from (4a, b, c), expansion (4d) applies to
them and the corresponding verbal forms get oxytone stress. So the con-
trast $surt+i+n$ 'they go out' (subjunctive) ~ $surt+i+m$ 'we go out' (subj.)
is gotten.

$\begin{bmatrix} +syll \\ +high \end{bmatrix}$ + V stands for a considerable number of words ending in
$i+ə$ (and some in $u+ə$) that are stressed on the preceding syllable.
Since words with the same ending but stressed on the penultimate vowel
($i+ə$) exist, those are considered to be /iy+a/ underlyingly. Although
no mention is made of them, words in $u+a$ (like $cacatúa$ 'cockatoo')
would have to end in /uw+a/, accordingly. (Existence of independent
support for a rule with the effect $iy \rightarrow i$ is claimed.)

The angled brackets are an attempt to capture the fact that verbs,
as opposed to nouns and adjectives, are never stressed before the last
syllable of the stem. Thus compare:

(5)   kərísi+ə 'caress'   əkərisí+ə   'he caresses'
      bálu+ə   'value'   əbəlú+ə   'he evaluates'
      tímit   'shy'   in+timíd+ə 'he intimidates'

For the remaining cases, the rule stresses the last syllable if
the word ends in C, and the penult if it ends in V (expansion (4d))
and the only vowel in monosyllables even if it is final (4f).

A considerable number of lexical items, which are marked [+E],
do not undergo the MSR. They are instead subject to the Minor SR which
reads

(6)   [+syll] → [+stress] / [X__C_0 $\begin{bmatrix} +syll \\ +E \end{bmatrix}$ [+segm] ([+segm]) (+C)#]

and can be expanded into

(7)   ərmóniûm+s
                                           'harmoniums'

a.   __C_0 $\begin{bmatrix} +syll \\ +E \end{bmatrix}$ [+segm][+segm]+C#]   ipó+təzi+s
                                           'hypothesis' (pl.)

b.   __C_0 $\begin{bmatrix} +syll \\ +E \end{bmatrix}$ [+segm][+segm]#]   ərmóniûm (sg.) índəks
                                                         'index'
                                           ipó+təzi (sg.)

c. $\_\_C_0 \begin{bmatrix} +syll \\ +E \end{bmatrix}$ [+segm]+C#]   ábit+s   áreə+s
                                          'habits'   'areas'

d. $\_\_C_0 \begin{bmatrix} +syll \\ +E \end{bmatrix}$ [+segm]#]   ábit (sg.)   áreə (sg.)

$C_0 \begin{bmatrix} +syll \\ +E \end{bmatrix}$ accounts for the extra syllable the stress is shifted backwards for items marked [+E], the following [+segm] ensuring that $\begin{bmatrix} +syll \\ +E \end{bmatrix}$ is nonfinal.

Before discussing the inadequacies of MSR and Minor SR, let me present some cases connected with verbal morphology that are dealt with in a special way.

Some tenses, mainly the past indicative and the past subjunctive, show paroxytone stress not predicted by the MSR (recall that verbs are redundantly marked [-E]:

(8)   pint+á+bə+w   'you-pl painted'
       bib+í+ə+m   'we lived'
       pint+é+si+m   'we painted' (subjunctive)

Two alternative solutions are proposed. One consists of a rule assigning the feature [+E] to the appropriate verb forms so that they undergo the Minor SR,

(9) $V \rightarrow [+E] \; / \; \begin{bmatrix} +PRET \\ -INF \end{bmatrix} X \_\_ + \begin{bmatrix} -syll \\ +lab \end{bmatrix}$

$\begin{bmatrix} +PRET \\ -INF \end{bmatrix}$ defining the corresponding tenses, and $\begin{bmatrix} -syll \\ +lab \end{bmatrix}$ the class containing m and w, the 1st and 2nd person markers, respectively. Under the second alternative the MSR is modified so that final s and n (2nd sg. and 3rd pl.) suffixes are extended to m and w in the appropriate tenses.

(10)

$$V \rightarrow [+stress] \; / \; [X<[-PRET]>_c\_\_C_0([+segm])< \begin{bmatrix} +syll \\ +high \end{bmatrix} +V)>(\left\{ \begin{matrix} -vocal \\ \left\{ \begin{matrix} -obstr \\ +cont \end{matrix} \right\} \\ <+cor>_d \end{matrix} \right\})#]$$

condition: if c then d

A second case in verbs where stress falls on the syllable preceding the one normally stressed by the MSR, involves two irregular verbs, *caber*, 'to fit in' and *saber*, 'to know' which show the following forms in the present subjunctive:

(11) kápigə   sápigə
      kápigəs   sápigəs
      kápigə   sápigə
      kəpigém   səpigém
      kəpigéw   səpigéw
      kápigən   sápigən

The MSR would stress the 1st and 2nd plural forms correctly but would wrongly stress the vowel *i* in the remaining forms. To prevent this, a rule is proposed that assigns the feature [+E] to 1st, 2nd and 3rd sg. and 3rd pl. in present subjunctive for verbs *saber* and *caber*.

For unstressed words several rules affecting boundaries are proposed. Thus prepositions and conjunctions are assigned word boundaries in the lexicon (or alternatively by rule). In the case of unstressed prepositions or conjunctions (*a, amb, de, en, per, i, que*) a special rule deletes the word boundary so that stress rules can't apply. Compounds are treated as two-stress words (compounds are discussed later, sections 6 and 8).

3.   Discussion

To summarize, the assignment of stress works as follows. Two rule, MSR and Minor SR, assigns stress to lexical items. One rule assigns stress to a last nonfinal vowel (i.e., $/\_\_C_0$ [+segm]##) optionally followed, in N's and A's, by the following sequences of suffixes, characterized in the S.D. of the rule by their segmental properties: *i+a, u+a*, plural marker *s*, 2nd person sg. *s*, 3rd person pl. *n*. The Minor SR assigns stress in similar though not identical conditions, one syllable further back.

MSR and Minor SR are disjunctive. Disjunctivity is attained in the following way. Items are marked either [+E] or [-E]. A redundancy rule marks [+E] items with a rule feature, [-MSR]. Some verb forms that are subject to the Minor SR are marked also [+E] by a special rule.

One of the main characteristics of this system is that disjunctivity is gotten through the use of diacritic features and rule features, instead of restricting it to the use of parentheses. Notice that the former procedure doesn't force the S.D. of one of the rules to be a proper subset of the other. Thus, in this case, a) MSR and Minor SR share identical expansions, and b) there are strings that never meet the S.D. of the rules. In the first case either of the specifications of the diacritic feature E would do to get the correct stress assigned, in the second the implicit claim is that some class of strings never receive stress. As one might expect, most of the examples that would fall in the second case (S.D.'s not met) are either impossible or non-

existing phonological representations. Actual examples, however, are also found. Consider the words *vértebra*, *ómicron*, *íntegra*, 'honest' (fem), *Hélsinki*, *Júpiter*, *déficit*. They should be marked [+E], since the only case where the MSR yields proparoxytones is when the sequence $\begin{bmatrix} +syll \\ +high \end{bmatrix}$ + V occurs (like in kərísi+ə). Now consider how these items would be stressed by the Minor SR (6). The +C part of the rule never plays a role since no final consonant is a morpheme on its own.

(12) ((7b))   ((7d))

$$\_\_C_0 \begin{bmatrix} +syll \\ +E \end{bmatrix} \text{[+segm][+segm]}$$ $$C_0 \begin{bmatrix} +syll \\ +E \end{bmatrix} \text{[+segm]}$$

bɛrtə	¬b	r	+	ə		bɛrtə b	¬r	+	ə	NO STRESS
intə	¬g	r	+	ə		intə g	¬r	+	ə	NO STRESS
ɛlsi	¬ŋ	k		i		ɛlsi ŋ	¬k		i	NO STRESS
ɔmi k	¬r	u		n		ɔmí kr	u		n	*ɔmíkrun
župi	¬t	ə		r		župí t	ə		r	*župítər
dɛfi	¬s	i		t		d fí s	i		t	*dəfísit

(where ¬ means S.D. not met)

For three items the S.D. is not met and they are left unstressed,[2] whereas for the other three the wrong vowel gets stressed. It might be possible that changing the form of the rules might account for *vértebra*, *íntegra*, *Hélsinki* and similar examples, but for the rest a new rule and a new feature would be needed. Words like *deficit* could in fact be stressed on any of the vowels (cf. défisit, əksplísit 'explicit', pləbisít 'plebiscite').

A second case of nonpredictable stress is provided by polysyllabic words ending in a stressed vowel. Under either MSR or Minor SR the stress would be assigned to one of the nonfinal vowels. Wheeler (1974), p. 310, proposes an underlying final *r* for these cases. There is a general rule deleting final *r*, as illustrated by the following alternations (see also Chapter 2, section 9):

(13) kəré   'street'   kərəró   'alley'
      pó   'fear'   purúk   'fearful'
      dú   'hard'   dúrə   'hard' (fem)
      fló   'flower'   flurétə   'small flower'
      sənsé   'whole'   sənsérə   'whole' (fem)
      klá   'clear'   kləritát 'clarity'

But for some words with no derivative there is no evidence of an underlying final *r*:

(14) mərsέ   'mercy'   šimpənzέ   'chimpanzee'
      bustέ   'you' (polite)   kumitέ   'committee'
      tərənná   'disposition,   bisturí   'scalpel'
                 way of acting'
      təbú   'taboo'   məmá   'mum'
      pəpú   'Papuan'   puré   'pure'
      pəpá   'daddy'   rundó   'rondo'
      bəmbú   'bamboo'   sufá   'sofa'
      munəstí   'monastery'   šampú   'shampoo'

Furthermore, in cases where derivatives occur, no *r* appears:

(15) kəfέ   'coffee'   kəfətəríə 'coffeehouse'
      pəruné   'fibula'   pəruneál   'fibular'
      frənəzí   'frenzy'   frənəzíə   'frenzy'
      pərú   'Peru'   pəruá   'Peruvian'

Of course there is an expansion of MSR that would stress a final vowel, namely __C_0#(=(4f)), but in polysyllabic words the expansion __C_0[+segm]# would apply first. Hence a new diacritic feature triggering the appropriate expansion would be needed to stress word final vowels.

Another set of cases that also involve oxytone stress is treated in a different way. Future and conditional tenses have stress on the desinence, whereas MSR would predict stress on the thematic vowel for future singular and 3rd plural and stress on the desinence for 1st and 2nd plural and conditional. Minor SR would give even worse results, retracting stress further back. The following examples correspond to the verb *cantar* 'to sing', the underlined vowel being the one stressed by MSR.

(16) kəntəré   kəntəríə
      kəntərás   kəntəríəs
      kəntərá   kəntəríə
      kəntərέm   kəntəríəm
      kəntərέw   kəntəríəw
      kəntərán   kəntəríən

The solution proposed goes along the lines of Harris (1969), 91-98, for future and conditional in Spanish. These tenses are analyzed as an infinitive (*cantár*) and an inflected auxiliary verb (*é*, *ás*, etc.; *ía*, *íes*, etc.), namely the verb *haver*, also used to form perfect compound tenses (*he cantat*, etc.). See Appendix II for conjugation of *haver*.

No real argument is offered to support the claim that future and conditional are compound forms, except, of course, that stress is correctly assigned by MSR. In addition the conditional desinence differs from the corresponding form of *haver* and a *v* deletion rule which is not independently motivated has to be posited.[3]

(17)　$[\#[kant+a+r]_{aux}[\#e\#]_V\#][[\#kant+a+r]_{aux}[\#avia\#]\#]_V$

stress-as.	é	í
v-delet.		∅
truncation		∅

　　　　　kantar　　é　　kantar　　ía

　　　Of course there exist similarities between future and conditional on the one hand, and infinitive+*haver* on the other. But this does not mean that such similarities have to be accounted for by the grammar. The explanation is, at least in part, historical. Future and conditional were once compound forms as shown by the fact that clitic pronouns could appear between infinitive and auxiliary. The question is rather whether the forms that are similar for historical reasons are analyzed today as compounds. Verbs with allomorphic roots usually have the same allomorph for infinitive, future and conditional (as would be expected historically) but this is not always the case: we thus have, along with the normal 1st person sg. form for *cantar* in (17), the following 1st person sg. forms:

(18)

Future	Conditional	Infinitive	
pudré	pudría	pugér	'can'
səbré	səbría	səbér	'to know'
kəbré	kəbría	kəpigér	'to fit in'
əwré	əwría	əbér	'to have'
suldré	suldría	sulér	'to use to'
bəldré	bəldría	bəlgér	'to be worth'
buldré	buldría	bulgér	'to want'
tindré	tindría	tənír	'to have'
bindré	bindría	bənír	'to come'
əniré	əniría	ənár	'to go'

　　　If, as will be proposed in Chapter 3, Future and Conditional forms have been reanalyzed, into a sequence of VERB STEM-DESINENCE (TENSE AND PERSON MARKERS) as all other tenses, these facts can be easily explained. In a synchronic analysis, just as we have different stems, e.g. for the first two verbs in (18), as in gerund *pugént*, *səpigént*, respectively, and 3rd person Pl. Present Indicative *pódən*, *sábən*, respectively, we find the same allomorphic stems *pugé* and *səpigé* in the Infinitive, and *pód* and *sáb* in Future and Conditional (in these tenses the stem vowel changes because it is destressed; see note 3). Diachronically, if Present, Future and Conditional were formed on the Infinitive, we would expect any change in the Infinitive stem or desinence to be carried over to these tenses, which is not the case. On the contrary, if Future and Conditional are independent tenses, we expect the facts in (18), namely that they take their own allomorphic stems, not necessarily the same as those of the Infinitive. The same is true of the desinence. In Chapter 2, section 9, I shall argue that a class of verbs has an irregular Infinitive marker ə (instead of *r*). As expected, Future

and Conditional show up with the *r* of their tense marker even though the Infinitive lost its *r* at some previous stage.

Another characteristic of the system under discussion is the use of phonological information to characterize the morphological environment in which a rule applies. In the MSR, for example, the rule applies regardless of the presence or absence of the plural marker (*s*), the 2nd sg. marker (*s*), and the 3rd pl. marker (*n*). Stating this as
$\left(+ \begin{bmatrix} -\text{vocal} \\ +\text{coron} \\ -\text{distr} \end{bmatrix}\right)$ at the end of the environment amounts to claiming that the generalization is of phonological nature. Given the fact that the number of morphemes consisting of a single consonant is scarce, this claim is difficult to support or discredit. However, let's imagine a situation where this would be possible. Suppose Catalan changes some of its suffixes. In the Present Indicative the present 1st person sg. marker is *u* and the 1st person plural marker is *m*. Thus *surt+u* 'I go out' is stressed by MSR (expansion (4d)) on the penultimate syllable ([súrtu]), and *surt+i+m* on the last since *m* is [-coron] and (4d) and not (4c) is met ([surtím]). (*i* is the thematic vowel, that deletes in some cases, like in *surt+u*). Now suppose the underlying form of *u* and *m* changed to *ut* and *n*, respectively. Normally when a change is introduced in underlying representations, the existing phonological rules apply to the new underlying forms as well. Thus in Catalan a rule voices word final continuants before an immediately following word initial voiced segment:

(19) triómf   'triumph'   triómvənəmík   'enemy's triumph'
      pás   'step'   pázʎárk   'long step'
      péš   'fish'   péžikárn   'fish and meat'

Recent borrowings ending in θ and x which were not part of the underlying representations of Catalan undergo the rule as any other item:

(20) *el senyor Smi*[θ]   *el senyor Smi*[ð] [ə]*rriba*
      'mister'   'arrives'

      J. S. Ba[x]   *J. S. Ba*[ɣ] [m]*agrada*
                                              'pleases me'

There is some reason to believe that the opposite would happen to our previous hypothetical cases, i.e., that despite the change in segmental form, the new verbal suffixes would behave in the same way with respect to stress. But the present rules predict a change in stress for those new forms:

(21) $\underset{\smile\ \smile}{s\acute{u}rt{+}u}$ $\underset{\smile}{surt{+}i{+}m}$

(4d) $\_\_C_0$ [+segm]   (4d) $\_\_C_0$[+segm] ($C_0{=}0$)

$\underset{\smile\ \smile}{surt\ \acute{u}t}$ $\underset{\smile\ \smile}{s\acute{u}rt\ i\ n}$

(4d) $\_\_C_0$[+segm]   (4c) $\_\_C_0$[+segm]+$\begin{bmatrix} -vocal \\ +coron \\ -distr \end{bmatrix}$

($C_0{=}0$)

Of course to say that one would expect or find more natural to have the stress pattern preserved in spite of minor phonological changes in underlying representations does not make (21) a counterexample. Although some real, more detailed case of that sort would be needed, it is perhaps worth observing that in the evolution from Latin, stress pattern tends to be preserved in the Romance Languages. Just to give an example, consider the Present Indicative in Latin, Catalan, Italian and Spanish (respectively):

(22) *ámo*   *ámo*   *ámo*   *ámo*
      ámas   *ámes*   *ámi*   *ámas*
      ámat   *áma*   *áma*   *áma*
      amámus   *amém*   *amiámo*   *amámos*
      amátis   *améu*   *amáte*   *amáis*
      ámant   *ámen*   *ámano*   *áman*

Moreover, the hypothetical form with *ut* instead of *u* does actually occur in a Catalan dialect close to the one discussed here. The actual form is [súrtut] and not [surtút] as would be predicted by the MSR.[4]

4.   Underlying Stress

In the following paragraphs I will present a system that follows from a quite different assumption, namely that for Catalan,

(23)   stress, rather than being a feature added in the
        course of the derivation, is like other segmental
        features part of the underlying representation
        of morphemes.

This doesn't mean that there are not generalizations to be captured or that surface stress is entered in the lexicon. First, conditions on well-formedness of underlying representations will restrict it to one of the three last vowels, the rest remaining unstressed. As far as monomorphemic nominals are concerned, this condition will do. Furthermore, such regularities as nonexistence of unstressed major lexical categories, oxytone character of verbal stems, can be easily accounted for in a similar way. In the case of polymorphemic words, three different situations may arise. In case only one stressed morpheme is present, the word stress falls on its accented syllable. If there are several stressed morphemes in the word, the word stress falls on the stressed

vowel of the last one. Therefore a rule destressing all but the last stressed vowel is needed:

(24) V → [-str] / ##X ___ Y [+str] Q##

The third case, where prestressed suffixes are involved, poses interesting problems. It is not possible to predict the effect of a prestressed suffix from the underlying stress pattern of the suffix. Consider the following cases, where the two possible alternatives (i.e. [+stress] and [-stress]) are considered for *ic* (*desgásten* 'they wear away', *malgastadór* 'spendthrift', *atómic* 'atomic').

(25)   *des+gást+en*   *mál+gást+á+dór*   *átom+ic*   *átom+ic*

   Destressing   -   -   -   *a*   *a*   *a*   -   *a*   -   -   -   -   -

           desgásten   *malgastadór*   **atomíc*   **átomic*

If *ic* has no underlying stress, it will behave like *en* in *malgásten*, and stress will remain in the position it had in the stem (penult since 'atom' is *átom*). If, on the other hand, we enter *ic* stressed, Destressing will apply. So we will get either **atomíc*, or **átomic* but not the actual *atómic*. One might think of different solutions to the problem. In any event, prestressed suffixes must carry the information that distinguishes them from both unstressed and stressed suffixes; some kind of boundary, for instance, might be proposed. Another interesting possibility is to adopt an autosegmental representation of stress in underlying form where suffixes like *ic* had penultimate stress.[5] Under any proposal, however, it is clear that THERE MUST BE SOME RULE, call it IC-RULE, assigning stress to the vowel preceding the suffix. I will return to this problem later.

Let us now turn to the problem of dealing with the facts accounted for by MSR and Minor SR and the problems that arose.

For the stress of words ending in *i+a*, *u+a*, (section 2) (e.g. *agonía* vs. *angúnia*) there is no more need for setting up an otherwise little motivated underlying /iy+a/, /uw+a/ to get the stress on penultimate syllable. Instead, the first word will have underlying stress on the last syllable of the root, the second word on the penultimate: /agoní+a/, /angúni+a/.

The use of the diacritic feature [±E] (section 2) and the others that are also needed (section 3) will be dispensed with. Differences in stress pattern that are lexically idiosyncratic will be differences in underlying representation, and not differences of membership in classes of lexical items as defined by a set of diacritic features. Notice that diacritic features like [±E] are operative just for stress. There won't be need for rules assigning rule features either. Let's consider the cases involving verb forms. A detailed and systematic

analysis will be presented in Chapter 3. A verb form has a stem consist-
ing of a root, possibly with derivational affixes, and a thematic vowel.
The stem is followed by tense markers, and these by person markers (in
the finite forms). Under the present system the stress should fall on
the root when no stressed suffixes follow, and on the last stressed
suffix if there are any. Such an analysis is compatible with the data
furnished by verbal morphology. Considering the thematic vowel and the
future and conditional markers stressed (as well as the root and any
derivational suffix in the stem), and all other suffixes unstressed,
accounts for all the verbal stress patterns. See Chapter 3 for details.
I shall give here only a set of illustrative forms (verb *bullir* 'to
boil'; whole paradigm in (1), Chapter 3).

(26)

ROOT	THEMATIC VOWEL	TENSE MARKER	PERSON MARKER	SURFACE FORM	
búλ	Ø	u	Ø	búλu	'I boil'
búλ	í	ə	s	buλíəs	'you boiled'
búλ	í	sí	m	buλísim	'we boiled (subj.)
búλ	í	ré	Ø	buλiré	'I shall boil'
búλ	í	Ø	m	buλím	'we boil'
búλ	í	ríə	s	buλiríəs	'you would boil'

It will be recalled that some verb forms presented some problems
to stress assignment by MSR and Minor SR. Since verbs were redundantly
marked [-E], the MSR had to apply to them. MSR assigns stress to the
penultimate vowel only if the verb ends in a vowel ((4d)) or in n, s
preceded by morpheme boundary. Thus cases (4a, b, c) are excluded.
Proparoxytones like the irregular forms in (27d, e) (also in (11))
cannot be stressed at all by MSR. The solution proposed to deal with
(8) and (11) involved some complications in the rule and use of rules
assigning diacritic features to some verb forms. Consider now the
UNDERLYINGLY stressed forms and their phonetic counterpart.

(27)   THEMATIC VOWEL

a.	pínt+á+bə+m	pintábəm
b.	bíb+í+ə+m	bibíəm
c.	pínt+é+sí+m	pintésim
d.	kápig+Ø+ə	kápigə
e.	sápig+Ø+ə	sápigə
f.	sápig+é+m	səpigém

In the cases where there is no thematic vowel the stress falls on
the root, otherwise on the thematic vowel. Cases (d), (e), (f) are
irregular. But notice that the irregularity involves suppletive forms
for some tenses. In the present system there is no need to make stress
assignment "irregular" as well, since surface stress follows from our
system automatically. The irregularity of *caber* and *saber* consists
of having two allomorphic roots /káb/ and /kápig/.

Notice also that the previous system couldn't state the generalization that "irregular" stress occurs whenever "irregular" suppletive stems occur, since some forms, namely *capiguém, capiguéu*, etc., get the "normal" stress. Under the present analysis, however, all forms in (27) are irregular, in the sense of having an allomorphic root /kápig/, but the fact that [kəpigém], [kəpigéw] don't get penultimate but final stress, follows from the fact that they have--as in other verbs--a stressed thematic vowel. Destressing (24) erases the "anomalous" stress on the root.

For future and conditional no compound structure needs to be posited in order to get stress assigned correctly. Future markers *ré, ré,* and *rá* are stressed suffixes and so is the conditional marker *ríə*. Destressing (24) will eliminate the root and the thematic vowel stress and the future and conditional forms will appear stressed, correctly, on the desinence.

5. Some Segmental Processes

Before continuing the discussion of our proposed stress system, some phonological processes have to be motivated and formulated in detail.

B-Devoicing. The combination $\begin{bmatrix} +syll \\ +stress \end{bmatrix} \begin{bmatrix} -son \\ +lab \end{bmatrix}$1 is almost always realized phonetically as V̊pl:

(28)
kóplə	'music band'	ublík	'oblique'
féplə	'feeble'	ublidá	'to forget'
móplə	'furniture item'	ubligá	'to force'
dóplə	'double'	sémblə	'it is likely'
əstáplə	'stable'	fébrə	'fever'
əmáplə	'kind'	bídrə	'glass'
póplə	'people'	əbl+ətíw	'ablative'

Only the following exceptions are known to me:

(29)
r̄əpúblikə or r̄əpúplikə	'republic'
públik or púplik	'public'
bíbliə	'Bible'
bíblik	'biblical'

Furthermore, there exist some alternations *b ~ p* in cases like those in (28):

(30)
móplə	'furniture item'	mubilyári	'furniture'
nóplə	'noble'	nubilyári	'relative to nobility'
bukáplə	'word'	bukəbulári	'vocabulary'
diáplə	'devil'	diəbólik	'devilish'
pusíplə	'possible'	pusibilitát	'possibility'
prubáplə	'probable'	prubəbilitát	'probability'

, The structure of words where the labial is always voiceless is
XV̌plə, since final ə is either epenthetic (no word ends up in surface
structure as XC [+sonor]##. See rule (11), Chapter 3), or the fem-
inine suffix. For the exceptions in (29) there are two possible anal-
yses for the first two examples: r̄əpúbl+ik+ə, públ+ik, or r̄əpúblik+ə,
públ ik since synchronic relation to póplə in (28) is debatable. For
bíblliə there is no independent morpheme bibl and it should be analyzed
as bíblli+ə and excluded from the process of devoicing. Let's therefore
propose tentatively the following rule, that would apply to items in
(28) and (30) and exclude or not, depending on morphemic analysis,
those in (29):

(31) b → p / V́ __ l +

The following examples might indicate that the process should be
extended to g:

(32) r̄éklə   'rule'
      séklə   'century'
      r̄éklə   'ruler'
      sílkə   'cycle'
      ər̄éklə   'he arranges'

The only possible alternation, however, is réklə ~ rəgulár 'rule'~
'regular' where the relatedness is dubious. (31), thus extended, would
not apply to words like [églugə] 'eclogue' since there is no morpheme
boundary after l. Finally, [síglə] 'acronym' is sígl+ə and constitutes
hence a counterexample to extending (31) to g. A modification for the
status of (31) will be proposed at the end of section 9.

Glide Formation. Consider the following alternations:

(33) i tórnə   'he returns there'   tórnə y   'return there!'
      sál i pá   'salt and bread'   pá y sál   'bread and salt'
      u tórnə   'he returns it'   tórnə w   'return it!'
      féz un sál '(make a) jump!'   fé wn sál 'to (make a) jump'

In general an unstressed high vowel becomes a glide after another
vowel and across word boundaries (the boundary between clitics i and u,
and the verb should be weaker than boundaries between words). But
the rule is also operative across morpheme boundary. Masculine marker
is usually Ø, but in a reduced number of cases it is u (feminine marker
is ə):

(34) Masculine   Feminine

      máku   'beautiful'   mákə
      gánsu   'calm; phlegmatic'   gánsə
      bur̄áču 'drunk'   bur̄áčə
      mónžu   'monk'   mónžə   ('nun')

(34) Masculine   Derivative

     féŕu   'iron'   féŕik 'ferric'
     súru 'cork'   suré 'cork' (adj.)
     bétu 'veto'   bətá 'to veto'
     gánšu 'hook'   gənšút 'hooked'

When u or the prestressed suffix ik appears after a vowel, they show up as w, yk:

(35)   déw   'god'   dəízmə   'deism'
        impíw   'impious'   impiətát 'impiety'
        əwrupéw 'European'   əwrupéə 'European' (fem.)
        kunŕéw   'cultivated land' kunŕeá 'to cultivate land'

        əlžəbráyk 'algebraic'   álžəbrə 'algebra'
        diəŕéyk 'diarrhoeic'   diəŕéə 'diarrhoea'

The distribution within morphemes, where both glide and vowel appear (ŕéynə 'queen', ŕəimét 'small grape') will be dealt with later. Glide Formation can be formulated as follows, where $\#_0$ stands for any number (including zero) of boundaries:

(36) $\begin{bmatrix} +syll \\ +high \\ -str. \end{bmatrix} \rightarrow [-syll] / [+syll]\#_0 \underline{\quad}$

6. Vowel Reduction

Catalan has seven distinct vowels, and the derived vowel ə:[6]

(37)

	ɔ	o	u	a	ɛ	e	i	ə
back	+	+	+	+	-	-	-	+
ATR	-	+	+	-	-	+	+	+
CP	-	-	-	+	-	-	-	-
hi	-	-	+	-	-	-	+	-
lab	+	+	+	-	-	-	-	-

as in the following examples:

(38) pɔ́rt 'harbor'   sák 'sack'   prím 'thin'
      gós   'dog'   pέl 'hair'   pər 'for'
      λúm 'light'   sérp 'snake'

In unstressed position, the vowel system is generally reduced to three vowels, u, ə, i, as shown by the following derivatives of the examples in (38):

(39)   səkɛ́t   'small sack'   λuminós 'light' (adj.)
      purtuári 'related to harbor' (adj.)   pəlút   'hairy'
      gusás   'big dog'   sərpɔ́tə 'big snake'
      əprimá   'to make thin'

It is clear that the rule that will account for these alternations
will have as input the vowels of (38) and derive those in (39), but
not in the opposite direction, since ə and u have different sources.
The rule should have this effect:

(40)   +stress   −stress

$$
\begin{array}{c}
ɔ \\
o \\
u \\
a \\
ɛ \\
e \\
i
\end{array}
\quad
\begin{array}{c}
u \\
ə
\end{array}
$$
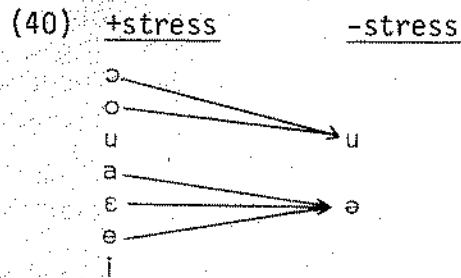
Although this accounts for the vast majority of cases, there are examples
where the process described does not take place. I will divide these
"exceptions" in three groups:

1) Contextual exceptions

    Underlying e, ɛ, followed by a, ə (derivable from a), are phonet-
ically e (instead of ə) when unstressed:

(41)   teátrə   'theater'   pərune+ál   'fibular'
      r̄eəlitát   'reality'   line+ál   'linear'
      meándrə   'meander'   kre+ə+rá   'he'll create'
      əsteárik   'stearic'   kunr̄e+á   'to cultivate'
      useənɔ́graf 'oceanographic'   kunr̄e+ə+rá 'he'll cultivate'

      (cf. pəruné 'fibula', kr̄éə 'he creates' and kunr̄éə 'he
      cultivates')

2) Lexical exceptions

    Some lexical items do not undergo the rule, but this property
doesn't correlate to any other phonological or morphological property,
i.e., it is lexically idiosyncratic.[7]

(42)   kláse   'class'   cf. with   pláse   'square'
      bóston   bósfur̄   'Bosphorus'
      sopráno
      báter   'restroom'
      kátedrə   '(university) chair'
      ópərə
      deskártes 'Descartes'   deskártəs 'you discard'
      kólerə   'cholera'   kólərə   'rage'

Two things have to be said with respect to the class of cases exemplified in (42). First, ə appears in these forms, and, since it is not present in underlying representation, the Vowel Reduction rule must have applied in some cases to the corresponding underlying source, a. Secondly, although the change to u and ə is blocked, ɔ, ɛ never appear in unstressed position (but o, e do appear).

3) Morphological exceptions

Some compounds, prefixed words, or phrases show a single stress, and an unstressed non-reduced vowel before it:

(43) sɛmi séntrə 'semi-center'   sensə gánə 'without hunger'
      ɾentə pláts 'dishwasher'   kap ɾeó   'no reason'
      kɔr ágrə   'heartburn'   kɔm kántə   'how he sings'

Since Vowel Reduction has been traditionally considered a general process, cases like (43) are usually treated as though the first element with the non-reduced vowel had a (secondary) stress on it. There is, however, evidence in Mascaró (1975), summarized here in Appendix I, that this is not the case. It is worth noting that here neither a "reduces" to ə nor ɛ, ɔ are "reduced" to e, o respectively. The seven vowel distinction in stressed position remains in the case of morphological exceptions.

The formulation of the rule of Vowel Reduction poses no problem if the three kinds of exceptions just discussed are ignored. It might take, for example, the following form:

$$(44) \quad \begin{bmatrix} +syll \\ -hi \\ -str. \\ <+lab> \end{bmatrix} \rightarrow \begin{bmatrix} +back \\ +ATR \\ <+hi> \end{bmatrix}$$

But it seems that at least the contextual exception should be built into the rule, its characterization being purely phonological. One problem is that the context most easily definable--most "natural"-- is the context in which the rule does NOT apply, i.e. before [+CP]. Recall that the ə's before which e appears will be a at the time Vowel Reduction applies. The context under which the rule applies is its complement, namely [-CP], [-syll], #. But assuming the latter generalization (i.e., before a non-CP vowel, a consonant, or word-finally) were to be right, we would still be faced with the problem of stating the structural change correctly. Recall that some kind of "partial" reduction with the effect ɛ → e is needed (krɛtá → kretá). Consider one possibility:

$$(45) \quad \begin{bmatrix} +syll \\ -hi \\ -str \\ <+lab>_a \\ <+back>_b \end{bmatrix} \rightarrow \begin{bmatrix} +ATR \\ <+hi>_a \\ <+back>_c \end{bmatrix} \quad / \underline{\quad} < \begin{bmatrix} +syll \\ +CP \end{bmatrix} >_d$$

<u>CONDITION</u>: $((\sim b \land \sim c) \leftrightarrow d) \land (b \rightarrow c)$

(45) is a scheme for the following rules $(V^1 = \begin{bmatrix} +syll \\ -hi \\ -str \end{bmatrix})$:

(46)

CONDITION		RULE	EFFECT
a b c d			
T T T F	i)	$\begin{bmatrix} V^1 \\ +lab \\ +back \end{bmatrix} \rightarrow \begin{bmatrix} +ATR \\ +hi \\ +back \end{bmatrix}$	$\begin{Bmatrix} o \\ \mathfrak{o} \end{Bmatrix} \rightarrow u$
F T T F	ii)	$\begin{bmatrix} V^1 \\ -lab \\ +back \end{bmatrix} \rightarrow \begin{bmatrix} +ATR \\ -hi \\ +back \end{bmatrix}$	$a \rightarrow \vartheta$
F F T F	iii)	$\begin{bmatrix} V^1 \\ -lab \\ -back \end{bmatrix} \rightarrow \begin{bmatrix} +ATR \\ -hi \\ +back \end{bmatrix}$	$\begin{Bmatrix} e \\ \varepsilon \end{Bmatrix} \rightarrow \vartheta$ (disjunctive with iv
T F F T		no [+lab, -back] segment existing in Catalan	
F F F T	iv)	$\begin{bmatrix} V^1 \\ -lab \\ -back \end{bmatrix} \rightarrow \begin{bmatrix} +ATR \\ -hi \\ -back \end{bmatrix} / \underline{\quad} a$	$\begin{Bmatrix} e \\ \varepsilon \end{Bmatrix} \rightarrow e / \underline{\quad} a$

The fact that BACK has to be added to the SD of the rule (since $a \rightarrow \vartheta / \underline{\quad} a$, cf. [sə́árik] 'saharic') and that Boolean conditions on expansions of brackets had to be introduced is a consequence of the assumption that what we have been calling "Vowel Reduction" is a single process and has to be captured by a single rule. Since no evidence has been brought so far to strongly support such a claim, it might be advisable to consider some alternatives. Suppose we consider that the fact that e, ɛ are realized as e before a has to be taken care of by a separate rule. Now this rule would have to be ordered with respect to the rule that accounts for the rest of the cases of Vowel Reduction. If ordered before, it would have to apply to e, ɛ, and if after, to ə since e, ɛ would have been converted into ə by the rule. To give an example,

(47) a.   krɛ+á   b.   krɛ+á

ɛ,e → e   e   Vowel Red.   ə

Vowel Red.   *ə   ə → e   e

Quite clearly, only the second ordering could work, since under the ordering ε,e → e--Vowel Reduction, the output ε,e → e would feed Vowel Red. and the final output would be *[krəá]. But consider what happens under the alternative ordering. The rule has to be formulated ə → e / __ a, and at this stage ə is the reflex not only of unstressed e,ε but also of unstressed a. Cases of *aa*, which would feed the rule also, show that the result is not ea but əa: [səárik] 'Sahara' (cf. [sáərə] 'Sahara'), [bəáí], 'Baal'; furthermore ə couldn't possibly have any other source than e, ε or a. Even worse, the context of application, namely -a has been subject to Vowel Reduction and appears as -ə, but -ə originates also from -e, -ε, in which case we don't want the rule to apply:

(48)   krε+á   krε+a+syó 'creation'   paeλ+έt+a 'small pan'

Vowel Red.   ə   ə ə   əə   ə
ə → e   e   e   e
               kreá   kreəsyó   *peəλέtə

The second rule would wrongly apply to yield [peəλέtə], since at this stage the e,ε-ə distinction is lost.

Before rejecting the hypothesis that contextual exceptions are to be accounted for by a separate rule, let us pursue it a little bit further. In order to avoid the contrary results of the two possible orderings discussed, ə → e should apply to a representation that will not undergo e reduction to ə later and to a representation that has the distinction e,ε ~ ə. The only way to achieve this without recourse to an increase in the power of phonological rules, allowing them to refer to more than one representation, is to split Vowel Reduction into two separate rules, (49a) and (49c), ə → e being ordered between them.[8]

(49) a. $\begin{bmatrix} +syll \\ -hi \\ -CP \\ -str \\ <+back> \end{bmatrix}$ → $\begin{bmatrix} +back \\ <+hi> \end{bmatrix}$

      b. $\begin{bmatrix} +syll \\ +back \\ -lab \\ -CP \end{bmatrix}$ → [-back] / __ $\begin{bmatrix} +syll \\ +CP \end{bmatrix}$

      c. $\begin{bmatrix} +syll \\ -hi \\ -str \end{bmatrix}$ → [+ATR]

This solution avoids the use of rule-specific Boolean conditions on brackets, but has to state the whole process in three (perhaps two, see note 8) steps. The need for having a single rule rests upon the need for capturing thereby a significant generalization. Rather, evidence can be presented that suggests that the opposite is true. In other words, in order to capture some generalization, two rules instead of one are needed. Recall that what we called "lexical exceptions" were words that didn't show so to say "full" reduction but only partial reduction of unstressed vowels. Furthermore, one case, namely a, showed "full" reduction to ə:

(50)   partially   totally
         reduced   reduced

    a ---------------------------→ ə
    ε → e
    e → e
    ɔ → o
    o → o

If rule (45) is adopted, some of its expansions must be prevented from applying to these kinds of items and, furthermore, a separate rule must be introduced to achieve the partial reductions. Under the revised formulation of (49), however, it is sufficient to say that lexical exceptions are not subject to rule (49a), i.e., that they don't undergo o,ɔ → u and e,ε → ə reduction.[9] They will undergo (49c), however, that makes unstressed vowels [+ATR], thus with the effect needed, i.e. e,ε → e; o,ɔ → o; and a → ə([-CP] supplied by convention, see note 8).

Thus, having a separate "Major" Vowel Reduction rule captures the fact that (except for morphological exceptions which are dealt with later below) no ε, ɔ or a appear unstressed in surface phonetic form, whereas o,e appear unstressed in some specific cases.

7.   Further Support for Underlying Stress

One of the consequences of underlying stress is that before the Destressing rule applies, representations will have a considerable number of phonetically nonrealized stresses, a situation that didn't arise in the theory of stress outlined in section 2. It is possible at this point to look for empirical evidence that would bear on this difference. In section 5 two rules were presented that had something in common, namely the feature [±str] in the S.D. A theory that predicts stress by assigning it only to the vowels that will show it in surface phonetic form predicts that rule (31) will apply only to b after phonetic stress, and that (36) will fail to apply only if, the rest of the S.D. being met, the second vowel is phonetically stressed. If stress is underlying, on the other hand, it might be possible that underlying but not phonetically realized stress has an effect on rules (31) and (36).

It might be possible that b devoices even after a phonetically un-
stressed vowel and ı doesn't become a glide after another vowel even
if unstressed. But, in addition, the conditions under which this
could happen are limited precisely to the cases where an underlying
stress further deleted by Destressing was present.

Let's now consider some of these situations. (cf. with (30)
and (33)):

(51) *o b ligaré*   'I'll force'   *sa u quér*   'elder'
      enno b liré   'I'll make noble'   *re u matísme*   'rheumatism'
      mo b láble   'furnishable'   *re i etó*   'kinglet'
      su b limáble   'sublimable'   *arr u ïnát*   'ruined'
      pro b lemátic 'problematic'   *re i ncidír*   'to relapse'
      dia b lería   'devilry'   *ra ï met*   'small grape'
      no b lésa   'nobility'   *arca ï tzava*   'It was archaic'

In all cases the stress shows up in the surface to the right of
the vowels that would be involved in the rules of B-Devoicing and
Glide Formation. But the actual phonetic forms show p in some cases,
b in others for the first set of examples, and ı and y alternate
similarly in the second set. Furthermore, (52) below shows that there
is a clearcut correlation between those alternations and the presence
of an underlying stress predicted by our theory. In other words, b
DEVOICES if the preceding vowel, though phonetically unstressed, was
stressed underlyingly; ı DOES NOT BECOME A GLIDE if, although un-
stressed, it had a stress underlyingly. The presence of the crucial
underlying stress in our examples (marked `) is determined by the
related forms in the second column:

(52)   Related forms or derivatives

o[b]ligaré   *oblíga*   'he forces', *obligár* 'to force',
                                            *óblig...
ennò[p]liré   *nóble*   'noble', *ennoblír* 'to make noble'
mò[p]láble   *móble*   'furniture', *moblár* 'to furnish'
sù[b]limáble   *sublím*   'sublime', *sublimár* 'to sublimate',
                                            *súblim...
pro[b]lèmátic   *probléma*   'problem', **próblem...*
dià[p]lería   *diáble*   'devil'
nò[p]lésa   *nóble*   'noble'

sa[ù]quér   *saúc*   'elder'
rè[w]màtísme   *réuma*   'rheumatism', *reumátic* 'rheumatic',
                                            *reúm...
rè[y]étó   *réy*   'king', *reiét* 'little king', **reí...*
arru[ı]nát   *ruína*   'ruin'
re[y]ncidír   **(re)íncid...*
ra[ı]mét   *raím*   'grape'
arcà[ı]tzára   *arcáic*   'archaic', *arcaítza* 'it is archaic'

Clearly, if B-Devoicing and Glide Formation apply before Destressing
has wiped out the crucial stresses, the S.D. of the former WILL BE
MET in the appropriate cases, and the S.D. of the latter WON'T BE
MET in the appropriate cases:

(53)   *obligáré nóblésa reincidír raimét*

B-Devoicing	---	p	---	---
Glide Form.	---	---	y	---
Destressing	o[b]*ligaré*	no[p]*lésa*	re[y]*ncidír*	ra[i]*mét*

Having underlying stress allows this to correctly predict some
phenomena difficult to handle by the previous theory. It might be
pointed out that one could propose, under the previous stress-assign-
ment theory, that stress is assigned cyclically and a Destressing
rule similar to (24) eliminates the superfluous stresses. Although
such a modification would do, as far as the present data are concerned,
it should be noticed that cyclic application is not necessary to handle
them. In other words, only one aspect of the cycle, a multiply-stressed
structure, would be needed. Underlying stress restricts its power to
just this aspect.

8. The Cycle

Let us return now to the MORPHOLOGICAL EXCEPTIONS to Vowel
Reduction mentioned in section 6, which have not been accounted for
so far. As I said, compounds (including some phrases) showed only
one stress, but had a nonreduced (not even partially as in lexical
and contextual exceptions) vowel. Since stress is present underlyingly,
we would have to have this vowel stressed, which would prevent Reduction
(49). We already motivated a Destressing rule (24) that would yield
finally the desired nonreduced unstressed vowel. So Destressing seems
to be a general process accounting for the monoaccented character of
words, simple or compound. The problem arises when we are faced with
the fact that destressed vowels don't reduce in compounds as just
discussed, but do reduce in simple words (see (38) and (9) for example).
It looks like opposite DESTRESSING ~ VOWEL REDUCTION orderings
are required for each case. Consider one example with nóbl+éz+a
'nobility' and pók+a#bargón+a 'wicked person',[10] phonetically [nupiézə]
and [pɔkəbərgóɲə]:

(54)   nóbl+éz+a   pók+a#bargón+a

1st	DESTRESS	ɔ	-		ɔ			-	
Ordering	VOW. RED.	u	-	ə	*u	ə	ə	-	ə
2nd	VOW. RED.	-	-	ə	-	ə	ə	-	ə
Ordering	DESTRESS	*ɔ	-		ɔ		-		

The ordering paradox in (54) CAN BE SOLVED by cyclic application
of the rules involved but, unlike the case discussed in the preceding

paragraph, it NEEDS cyclic application or a device with equivalent power.

(55)   [##nɔ́bI+éz+a##] [#[#pɔ́k+a] [#bargón+a#]#]

1st	DESTRESS	ɔ			---	---		
CYCLE	VOW. RED.	u	ə		ə	ə	ə	
2nd	DESTRESS				ɔ			
CYCLE	VOW. RED.				-			

To block Vow. Red. in the second cycle we have to assume that this is a word level rule, i.e., that it applies in the domain [Q__Q'] to the whole string (Q, Q' not containing #). So the apparent exception to the process of Vowel Reduction can be derived from a general principle of rule application. Destressing can be applied generally to any lexical item, but in simple words the cycle predicts that Vow. Red. will reduce the vowels just destressed, and in compounds this will not happen since it will have been restricted to previous cycles where the stress was still present.

Consider yet another case. As discussed in the preceding section, underlying stress prevents i and u from becoming a glide, even when this stress is removed later in the derivation. But Glide Formation (36) applied also across word boundary, and we would expect blocking of the rule also in that situation, but instead we get the glide. In this particular case, namely Glide Formation across #, the theory of underlying stress seems to fail. Consider the derivations of *a obrir* '(in order) to open' and *no instar* 'not to instate'.

(56)   a#ɔ́brír   nó#ínstár

(36)	GLIDE FORM.	---	-
(24)	DESTRESS	ɔ	í
(49)	VOW. RED.	ə u	--

                                      *əubrír   *nóinstár

If we want Glide Formation to apply to get the correct [əwbrí(r)] and [nóynstá(r)], (36) should apply after Destressing, but this would yield the wrong result in our previous cases in (52). Here again we can take advantage of the fact that the destressed vowel is within the inner brackets ([ɔ́brír], [ínstár]) and the preceding vowel in the outermost. Cyclic application, while not affecting our previous data in section 7, correctly predicts the ones in (56):

(57) [a[ɔ́brír]]   [nó[ínstár]]

	[a[ɔ́brír]]	[nó[ínstár]]
GLIDE FORM.	–	–
DESTRESS	ɔ	i
VOW. RED.	u	–
GLIDE FORM.	w	y
DESTRESS	–	–
VOW. RED.	ə	–

əwbrír   nóynstár

9. Strict Cyclicity

In the two previous sections certain processes requiring what we might term multiple application of rules were presented. It was shown that for stress assignment the full effect of the cycle was not needed-- and therefore cyclicity of stress assignment not justified. Rather, the presence of stresses not found in surface phonetic form was correct- ly predicted by a system where stress is not assigned by rule but pre- dicted on the basis of the presence of [±stress] in underlying form, and a few stress rules. Interestingly enough, arguments for the cycle appear in connection with those processes involving phonological rules (Destressing, Glide Formation) and not with such regularities as dis- tribution of underlying stress. In this section I will discuss some cases that bear on the notion "phonological cycle," as defined in the Introduction.

A first problem arises by overapplication of cyclic rules. In section 8 it was shown that Destressing and Glide Formation, as well as Vowel Reduction, apply cyclically. Furthermore, in section 7 it was argued that Glide Formation preceded Destressing. This prevented underlyingly stressed vowels from becoming glides. But under cyclic application Glide Formation would have a chance to apply after the vowel had been destressed. Consider, for example *ruïnosíssim* 'very ruinous' derived from *ruïnós* 'ruinous', which in turn is derived from *ruïna* 'ruin' (the final vowel in *ruïna* is the feminine marker).

(58)   [[[r̄uín] óz] ísim]

GL. FOR.	–
DESTRESS	i
GL. FOR.	*y
DESTRESS	o

After Vowel Reduction we would get *[r̄uynuzísim] instead of [r̄uínuzísim].

In other cases the ordering Glide Formation-Vowel Reduction prevents the former from applying. In [káus] 'chaos', [ətíup] 'ethiopian',

[diuptríə] 'diopter', the u doesn't become a glide because it is under-lyingly ɔ and Glide Formation applies before it is reduced to u. The u is not underlyingly stressed since in this case it would show its stress, being the rightmost, on the surface. But the vowel must be ɔ, because when stress is shifted by a prestressed suffix, ɔ shows up: [kəɔ́tik] 'chaotic', [ətiɔ́pik] 'ethiopic', [diɔ́ptrik] 'dioptric'.[11] Here again, even though ordering correctly prevents Glide Formation from applying, reapplication of this rule in a later cycle would give the wrong result:

(59)   [[súpaȓ] [káɔs]]

GL. FOR.   -   -
VOW. RED.   ə   u

GL. FOR.   w
VOW. RED.   ---

And, instead of [supəȓkáus], *[supəȓkáws] would be derived. But re-application of rules in both (58) and (59) would be "improper" under the notion of "phonological cycle" developed in the Introduction, since Glide Formation would, in both cases, return to earlier cycles without making use of information "proper" to its cycle. Three cases under which a rule R applies properly on any given cycle j were distinguished in the Introduction ((3)). I shall continue to refer to (60) as the Strict Cycle Condition (SCC):

(60)   a.   R makes specific use of information uniquely in

        cycle j. That is, it refers specifically to some

        A in $[_j XAY [_{j-1} . . .]_{j-1} Z]_j$ or $[_j Z [_{j-1} . . .]_{j-1} XAY]_j$.

    b.   R makes specific use of information within different

        constituents of the previous cycle, which cannot be

        referred to until cycle j. R refers thus to some A, B

        in $[_j X [_{j-1} . . . A . . .]_{j-1} Y [_{j-1} . . . B . . .]_{j-1} Z]_j$.

    c.   R makes specific use of information assigned on cycle

        j by a rule applying before R.

None of these cases applies to either (58) or (59) and Glide Formation can't apply.

Consider also the derivation of *raonament* 'reasoning' where both the fact of being underlyingly [-hi] and the fact of having underlying stress, prevent o from becoming a glide. For justification of a being stressed underlyingly, see the parallel nominal derivatives in Chapter 3 (section 2, (4)). Recall also that (60a) prevents rules from applying on the 0th cycle (see Introduction).[12]

(61)   [[[r̄aón] á] mén]

1st	
GL. FOR.	--
DESTRESS	o
VOW. RED.	əu

2nd	
GL. FOR.	blocked by SCC
DESTRESS	a
VOW RED.	ə

Glide Formation is blocked because at the stage it can apply, it applies
to the string au that contains no crucial information proper to the
second cycle.

In general it is the case that Glide Formation operates only across
cyclic boundaries. Thus we find in front of the examples just mentioned
those in (33) and (35) like [[tórnə]w] and [[əlžəbrá]yk]. We find
therefore contrast between VV and V-Glide sequences, like in the follow-
ing derivations:

(62)   [[[saúk]é] [[íbrid]át]]   [[[pruduí]rá] [[[óksid]á]syó]

1st				
GL. FOR.	--	--	--	--
DESTRESS	u	i	i	ɔ
VOW. RED.	ə-	--	--	u

2nd				
GL. FOR.		y		--
DESTRESS		--		a
VOW. RED.		--		ə

s ə u k é y b r i d á t

3rd				
GL. FOR.				w
DESTRESS				--
VOW. RED.				--

p r u d u i r á w k s i d ə s

Underlying stresses are justified by [səúk] 'elder', [íbrit] 'hybrid',
[pruduí] 'to produce', [pruduím] 'we produce', [óksit] 'oxide', [uksidá]
'to oxidize'. See also Chapter 3, sections 2, 3 for evidence that them-
atic vowels as í, á in the verbal forms mentioned are underlyingly stressed.
The phonetic forms that result from the deivations in (62) show both two
sequences of nonconsonants, one of the form vowel--high vowel, the other
of the form vowel--high glide. (60) correctly prevents application of
Glide Formation on the first cycle, but doesn't on the last cycle, by
virtue of which some crucial information is used.

I still haven't presented any case which falls positively under (60c). Recall that part (c) allows a cyclic rule to apply if CRUCIAL information in the form of the result of application of a previous PHONOLOGICAL RULE is introduced during the given cycle. I showed earlier (see (25) and corresponding discussion) that the stress of words with prestressed suffixes like ik had to be predicted by rule, since underlying stress and Destressing were insufficient. Whenever a prestressed suffix appears the preceding vowel is either a, i, u, ɔ, or ɛ but never e or o.

(63)

púdik	'modest, chaste'	təléfun	'telephone'
ərábik	'Arab'	mikrɔ́fun	'microphone'
mítik	'mythical'	məgáfun	'megaphone'
kántik	'canticle, song'	dəkámətrə	'decameter'
tɔ́ksik	'toxic'	təlɛ́mətrə	'rangefinder'
əspléndit	'splendid'	tərmɔ́mətrə	'thermometer'
bálit	'valid'	dəsímətrə	'decimeter'

Furthermore, morphemes with stressed é, ó change it to ɛ́, ɔ́ before these suffixes:

(64)

séntrə	'center'	séntrik	'centric'
glukózə	'glucose'	glukɔ́mətrə	'glucometer'
numéru	'I enumerate'	numɛ́rik	'numerical'
pédrə	'stone'	pɛ́tri	'stony'
tóru	'I toast'	tɔ́rit	'torrid'
dibizó(r)	'divisor'	dibizɔ́ri	'divising'
ədultéru	'I adulterate'	ədultɛ́ri	'adultery'
ión	'ion'	iɔ́nik	'ionic'
umér	'Homer'	umɛ́rik	'Homeric'

Therefore, a rule is needed with the effect

(65) $\begin{bmatrix} +syll \\ -hi \\ +str \end{bmatrix} \rightarrow [-ATR]$ under certain conditions

To determine the conditions under which this takes place, we might just refer to the class of prestressed suffixes in an ad hoc manner. But it would be surely better to refer to them in some general way, i.e., by some shared property. The most obvious property of the class is that they attract stress to the preceding syllable. But to build such a condition into the rule itself would mean to increase considerably the power of phonological rules and correspondingly so decrease their empirical content. To abandon the reference to the stress attracting property on the other hand, would mean to lose a generalization by allowing two rules, namely the rule attracting stress (IC rule) and (65) to refer twice to an arbitrary set of morphemes.

The only way of allowing reference to the prestressing property is to derive it from some general principle of the grammar. In other words we can ask ourselves if (65) applies just to the class of words containing a prestressed suffix without having to put any additional constraint on the rule itself. Consider the four possible cases, a word without suffix, with a neutral suffix, with a stressed suffix and with a prestressed suffix (ə in [séntrə] is epenthetic, see rule (11), Chapter 3):

(66) séntrə   'center'   səntr+ál 'central'
      séntr+i   'he centers' (subjunctive)   séntr+ik 'centric'

[səntrál] is no problem since the root vowel is going to be destressed and reduced to ə anyway. Rule (65) would predict correctly [séntrik], but would give incorrect results *[séntrə] and *[séntri]. But what distinguishes [séntrə] and [séntri] from [séntrik] is precisely the property in (60c). Our theory of underlying stress makes all the information crucial for rule (65), i.e. [+syll, -hi, +str.], underlying information. No crucial information will be introduced by any cycle in [séntrə] and [séntri]. But for [séntrik] there is a rule that stresses a preceding vowel when a prestressed suffix appears. On the cycle where this occurs, crucial information for rule (65), namely [+str], will be introduced, and the rule allowed to apply. Furthermore, notice that the rule applies whether or not the vowel was already stressed (cf. [símbul] 'symbol'--[simbólik] with [séntrə]--[séntrik]). Thus the sole fact that crucial information was introduced by virtue of that cycle, whether or not it was already present, allows the rule to apply.

To give some additional support to the analysis presented for the data in (63) and (64), recall that one of the Vowel Reduction rules, (49c), read as follows:

$$(67) \quad (=(49c) \quad \begin{bmatrix} +syll \\ -hi \\ -str \end{bmatrix} \rightarrow [+ATR]$$

and (67) and (65) can be collapsed:

$$(6B) \quad \begin{bmatrix} +syll \\ -hi \\ \alpha str \end{bmatrix} \rightarrow [-\alpha ATR]$$

Returning to Vowel Reduction, it should be noticed that in cases like [səntr+ál] in (66), Vowel Reduction will not be blocked by the SCC, because on the corresponding cycle Destressing will apply first, introducing information specifically required by the rule: [séntr+ál] → [sentr+ál] → [səntr+ál]. Therefore DESTRESSED vowels will REDUCE and RESTRESSED vowels (like ɛ in [séntrik]) will become ɛ, ɔ. On the

other hand, the SCC predicts that underlyingly stressed vowels that are
not restressed will remain the same, as they do, as I have shown. Finally,
NEVER-STRESSED vowels should, except for ə which is not an underlying
segment, be entered in the lexicon in their surface form.[13] This is the
only consequence of the SCC not given support so far. Notice that it
will imply some kind of morpheme structure condition to disallow under-
lying unstressed vowels other than a, i, u. If this is true, that is,
if there exist separate rules of MORPHEME STRUCTURE and PHONOLO-
GICAL "Vowel Reduction," we would expect as a possibility that they
evolve separately. It is a well known fact that LEXICAL EXCEPTIONS
to Vowel Reduction mentioned in section 6, are recent. Thus words with
unstressed e and o like [bóston], [kátedrə], [ópera] will have to be
underlyingly /bóston/, /kátedra/, /ópera/. This means that the rules of
Vowel Reduction can now apply obligatorily and lexical items will not
have to be marked as exceptions for some of the rules, contrary to what
was proposed in section 6. Instead, words like those just mentioned
will violate an otherwise quite general condition on underlying forms
that prohibits unstressed e, o. The SCC will prevent obligatory Vowel
Reduction from applying to these items since the rule is obligatory and
neutralizing and makes no further use of information introduced during
the cycle. Now recall that Destressing (24) was presented in its more
general form, assigning [-stress] to any vowel in the context ##X__Y
[+stress] Q##. In other words, the vowel in the S.D. need not be
stressed. Since Vowel Reduction specifically mentions [-str] if this
feature specification is introduced during any given cycle, Vowel
Reduction will no longer be blocked by the SCC. Like in the cases where
a stressed vowel was restressed and underwent the rule forming ĕ, ŏ
([séntrik] → [sɛ́ntrik]), here the SCC predicts that any destressed vowel,
whether or not underlyingly unstressed, will reduce. And here are the
facts:

(69)

		'Bostonian'		'chairholder'	
		[bóston]	[bóston+yá]	[kátedra]	[kátedra+tik]
IC RULE	--	--	--	--	á
DESTRESS	--	o	o	--	a e
VOW. RED.	SCC	u	u	SCC ə[13]	ə ə
	bóston		bustunyá	kátedrə	kətədrátik

		'operistic'	
		[ópera]	[óper+íst+ik]
IC RULE	--		í
DESTRESS	--	ɔ e	
VOW. RED.	SCC	u ə	
	ópera	upərí19stik	

We should also revise B-Devoicing, rule (31), in the light of the
SCC. The process is neutralizing, because both b and p are underlying

segments, and obligatory. Therefore SCC should block application on the first and subsequent cycles, since the sequence V́pl is always within the 0th cycle.[14] It follows that B-Devoicing cannot be a phonological rule. The restatement of (31) as a morpheme structure condition is quite natural, since B-Devoicing always applies within morphemes.

CHAPTER TWO: CONSONANTAL ALTERNATIONS

In this chapter I shall examine in detail several consonantal phe-
nomena found in Catalan. The cyclic nature of some segmental processes
that was argued for in the case of vowel alternations in Chapter 1 is
extended here to other segmental rules. They will be used to test the
proposal about the phonological cycle presented in the Introduction.
The analysis of stress presented in the preceding chapter will be given
additional support. In addition to the argument presented in section 10,
it should be noticed that although several of the rules discussed are
sensitive to stress ((46), (50), (56)), they are, as those in Chapter 1,
applying after a putative rule of Stress Assignment, and therefore are
consistent with the theory that maintains that stress is present under-
lyingly.

1.   Assimilation of Nasals

Regressive assimilation is a common feature of Catalan consonants.
There are assimilations of voicing, point of articulation, nasality,
and total assimilations.

Regressive assimilation takes place in a sequence of a nasal
and a consonant. The following examples illustrate the different
possibilities.[1]

(1)   Place of Art.

(VOWEL)	so[m]amics 'we are' 'friends'	so[n]amics 'they are'	
LABIAL	so[m]pocs 'few'	so[m]pocs	ti[ŋ]pa 'I have' 'bread'
LABIODENTAL	so[ɱ]feliços 'happy'	so[ɱ]feliços	á[ɲ]feliç 'year'
DENTAL	so[m]dos 'two'	so[ṇ]dos	etc.
ALVEOLAR	so[m]sincers 'sincere'	so[n]sincers	
POSTALVEOLAR	so[m]rics 'rich'	so[ṇ]rics	
LAMINOPALATAL	so[m][ž]ermans 'brothers'	so[n,][ž]ermans	
PALATAL	so[m][λ]iures 'free'	so[n,][λ]iures	
VELAR	so[m]grans 'big'	so[ŋ]grans	

(1) shows that assimilation in point of articulation isn't complete
in many cases. First of all, high nasals, ɲ and ŋ never assimilate to
the following consonant. Secondly, m assimilates only to a following

labiodental: *so*[ɱ]*feliços*, but *so*[m]*grans*. Finally, although palatal consonants trigger assimilation of n, this does not become homorganic with them, but only laminopalatal: *so*[n,][λ]*iures* instead of **so*[ɲ]- [λ]*iures*. In (1) nasal and consonant were separated by word boundary. Assimilation takes place also within words:

(2) *si*[ɱf]*onia*   *i*[ɱf]*init*
   'symphony'   'infinite'
   diume[n,ž]*e*   *i*[n,ž]*ust*
   'Sunday'   'unjust'
   a[ŋg]*lès*   *e*[ŋk]*litic*
   'English'   'enclitic'

The different points of articulation are defined by the following features:

(3)

	pbm	p,ɱ	tdṇḷ l s z	t'd'n r r̄	tḍṇ š ž č	t,d,ĵ	ɲλ	kg
back	–	–	–	–	–	–	–	+
labial	+	+	–	–	–	–	–	–
high	–	–	–	–	+	–	+	+
anterior	+	+	+	+	+	–	–	–
coronal	–	–	+	+	+	+	–	–
distributed	+	–	+	–	–	+	+	+

The specifications for [bk], [lab], [ant] and [cor] are clear from the articulatory characteristics of the consonants (see Badia (1951), 85-86). For [distr] see the palatograms in Barnils (1933), 31-36 and the measurement thereof in Mascaró (1972) 63-65. Evidence of at least the trilled [r̄] being [+hi] will be given below, section 3.

Using the variable notation for assimilation processes, we might propose tentatively the following rules, to be modified later, which apply across any number of boundaries.

(4) $$\begin{bmatrix} +nas \\ +cor \end{bmatrix} \rightarrow \begin{bmatrix} \alpha bk \\ \beta lab \\ \gamma ant \\ \delta cor \\ \varepsilon distr \end{bmatrix} / \underline{\quad} \#_0 \begin{bmatrix} +cons \\ \alpha bk \\ \beta lab \\ \gamma ant \\ \delta cor \\ \varepsilon distr \end{bmatrix}$$

$$(5) \quad \begin{bmatrix} +\text{nasal} \\ +\text{lab} \end{bmatrix} \rightarrow [+\text{distr}] \: / \: \underline{\hspace{1cm}} \: \#_0 \begin{bmatrix} +\text{cons} \\ +\text{lab} \\ +\text{distr} \end{bmatrix}$$

The omission of [hi] in (4) accounts for the partial assimilation of n to palatals, as in *so*[n,λ]*iures*. The other case where n is before a [+hi] consonant is before a velar. In this case n becomes [+hi] by linking conventions and the feature need not be mentioned in the rule (cf. Kean (1974), 120-121 and 28-29).

2. Assimilation of Stops and the Strict Cycle Condition

The assimilation of stops to a following consonant is parallel to that of nasals: t, d assimilate in point of articulation to any following consonant, but only partially to a palatal, and p, b assimilate only to a labiodental. In addition, however, t, d become nasals or laterals if the following consonant is a nasal or a lateral, respectively; and p, b become nasals before m. k, g don't assimilate, but g is nasalized before [n] morpheme internally. Here are some examples:

(6)
se[t]	'seven'	*ca*[p]	'no'	*po*[k]	'few'
se[m]*mans*	's. hands'	*ca*[m]*ma*	'n. hand'	*po*[k]*pa*	'f. bread'
se[p,]*focs*	's. fires'	*ca*[p,]*foc*	'n. fire'	*po*[k]*sol*	'f. sun'
se[l]*linies*	's. lines'	*ca*[p]*signe*	'n. sign'	*po*[k][š]*ai*	'f. lamb'
se[t,][š]*ais*	's. lambs'	*ca*[p]*casa*	'n. house'		
se[λ][λ]*ibres*	's. books'			*i*[ŋ]*norància*	'ignorance'
se[k]*cases*	's. houses'			*re*[ŋ]*ne*	'kingdom'
				ma[ŋ]*nific*	'splendid'

All the processes illustrated in (6) are optional. When there is no assimilation in place of articulation the stop appears agreeing in voicing with the following consonant as a result of the rule of voicing assimilation. *se*[m][m]*ans* or *se*[d][m]*ans*, *se*[k][k]*ases* or *se*[t][k]*ases*, *ca*[m][m]*a* or *ca*[b][m]*a*, *po*[g][λ]*iure*, etc.

The corresponding rules are ((7) and (8) (optional)):

$$(7) \quad \begin{bmatrix} -\text{son} \\ -\text{cont} \\ +\text{cor} \end{bmatrix} \rightarrow \begin{bmatrix} \alpha\text{bk} \\ \beta\text{lab} \\ \gamma\text{ant} \\ \delta\text{cor} \\ \epsilon\text{distr} \\ \zeta\text{nas} \\ \eta\text{lat} \end{bmatrix} \: / \: \underline{\hspace{1cm}} \: \#_0 \begin{bmatrix} +\text{cons} \\ \alpha\text{bk} \\ \beta\text{lab} \\ \gamma\text{ant} \\ \delta\text{cor} \\ \epsilon\text{distr} \\ \zeta\text{nas} \\ \eta\text{lat} \end{bmatrix}$$

$$(8) \quad \begin{bmatrix} -\text{son} \\ -\text{cont} \\ +\text{lab} \end{bmatrix} \rightarrow \begin{bmatrix} \alpha\text{distr} \\ \beta\text{nas} \end{bmatrix} \: / \: \underline{\hspace{1cm}} \: \#_0 \begin{bmatrix} +\text{cons} \\ \alpha\text{distr} \\ \beta\text{nas} \end{bmatrix}$$

(9) $\begin{bmatrix} -son \\ -cont \\ +bk \end{bmatrix}$ → [+nas] / ___ $\begin{bmatrix} +nas \\ +cor \end{bmatrix}$

Rule (9) requires some comments. It could be argued that since the rule applies within morphemes converting XgnY into XŋnY it might be dispensed with and the corresponding morphemes set up underlyingly XŋnY. First of all there seems to be no case of ŋ+n but there is no case of g+n either, to my knowledge. But g would then also be the only stop not appearing before n. Cf. *hi*[bn]*osi* 'hypnosis', *è*[dn]*ic* 'ethnic'. There is in fact no word of the form XgnY. Foreign words with gn are pronounced with ŋn, e.g. *Wa*[ŋn]*er*. But these facts alone don't justify the rule. We still could have a morpheme structure condition disallowing gn but allowing ŋn. This is fact would be required by the SCC which would prohibit the application of a rule such as (9) on the 0th cycle, i.e., within the morpheme. But there is no evidence whatsoever that [ŋ] is an underlying segment in Catalan. To see this, consider the cases where phonetic ŋ appears. It can appear a) before n, as we have seen b) before a velar consonant, as a result of nasal assimilation (section 1), and c) word finally. In this last case in most cases there is evidence of a velar consonant being deleted, so c) can be reduced to b) (see sections 6 and 7). Now if ŋ is not an underlying segment, the SCC doesn't prevent (9) from deriving XŋnY from XgnY, (9) being noncyclic.

The other rules discussed, however, will be affected by the SCC. Thus *simpàtic* 'kind' will have to have underlying /mp/ since assimilation of nasals would be prevented from applying to [[sinpát]ic]. The SCC therefore implies that there is a morpheme structure condition with the effect of disallowing sequences /np/.

Consider now the case of assimilation of coronal stops. This rule being optional, the SCC doesn't apply and we will be able to have underlying sequences /dn/, /tp/, etc. Nothing prevents the existence of sequences /nn/, /pp/, etc., and, in fact, they exist. We therefore find contrasts between stops presenting always "total assimilation" and stops having two variants, one with "total assimilation," the other just with voicing assimilation: [pərénnə]~*[pərédnə] 'perennial', but [énnik]~ [édnik] 'ethnic'; [óbbi]~*[ódbi] 'obvious' but [əbbén]~[ədbén] 'Advent'. Interestingly enough, some of the examples belonging to the first group (always "total assimilation") must have belonged at some stage to the second group: [kónnə]~*[kódnə] 'crackling' Lat. CUTINAM through [kótna] by normal evolution (Coromines (1971), 358). At some stage the assimilation must have been obligatory, at least for [kótna] and similar cases. In such a situation, *cotna* would have to change its underlying form /kótna/ to /kónna/, for the SCC would prevent obligatory assimilation tn → nn from applying. If the rule then becomes optional, as it must have, since *cotna* has changed its underlying form, it will not be subject to it and should show up, as it actually does, ALWAYS as [kónnə].

If its underlying form were to be, against the requirements of the SCC, /kótnə/ or /kódnə/, at the time the rule became optional, we would expect *cotna* reappearing with the two variants as other words, i.e., [kónnə] and *[kódnə]. A more recent example of reanalysis is the word [fubbɔ́l] 'soccer' from Eng. [fʊ́tbɔ́l]. Other possible direct sources of the borrowing, Spanish [fútbol] or [fúδβol] (cf. Real Academia (1973), 20) or early (*foot-ball*) and actual (*futbol*) orthographic forms don't show assimilated b. In my own speech at least, *futbol* hasn't the variant *[fudbɔ́l]. Another case is the sequence tλ, phonetically [d,λ] (see (6)): *se*[d,][λ]*ibres* 'seven books'. If there were morpheme-internal /tλ/ (or /dλ/), they would appear as [d,λ], but there are only examples with [λλ]: [əspáλλə] 'back! (body part), [r̄ɔ́λλu] 'roll', [mɔ́λλu] 'mold', [əmmɛ́λλə] 'almond'. Thus a morpheme structure condition disallowing /tλ/ or /dλ/ is independently motivated. If this condition didn't exist, the morphemes with underlying /tλ/ or /dλ/ would have to undergo complete assimilation, so the rule of assimilation would have to be modified to yield complete assimilation to palatals, but only within morphemes. Moreover, some of these forms arose from words with tλ or dλ<tl, dl<tVl, dVl: SPATULAM>[əspáλλə], ROTULUM>[r̄ɔ́λλu], MOOULU> [mɔ́λλu], AMIDDULA>[əmmɛ́λλə] (Badia (1951) 216, 217). Here again, if after undergoing complete assimilation to [λλ] they had been represented underlyingly as /tλ/ or /dλ/, the actual rule which doesn't yield complete assimilation would wrongly predict *[əspád,λə], etc.

3. Nonstops and Laterals

f never assimilates in point of articulation. The case of sibilants is a little bit complicated because of an independent rule that merges sequences of identical nonstops, e.g., [péš][šík] → [péšík] 'small fish', [búf][fɔ́r̄t] → [búfɔ́r̄t] 'strong blow', [més][sál] → [mésál] 'more salt'. Merging occurs also between different sibilants, e.g. [més][šík] → [méšík] 'smaller'. For cases with sš one could either postulate the existence of assimilation yielding šš and subsequent merging to š, or just suppose that a single rule deleted the first of two sibilants, thus sš → Øš. Cases with identical sibilants would be handled by either solution. But consider the following cases involving sequences šs and sr̄ (r̄, a trilled r). [péš][səlát] becomes [pés'əlát] 'salted fish'. What I transcribe as s' has been described as a sound 'intermediate between s and š' (Badia (1951), 105) or as a sequence šs, š being more weakly articulated (Coromines (1971), 247-248). What is of interest for the present discussion is that in any case the duration of the resulting sound is that of a single sibilant. The merging rule has applied, quite naturally, also in the case of šs. But if the process were to be formulated as the truncation of the first segment without assimilation, we would expect [péš][səlát] → *[pésəlát]. The phonetic output of sequences sr̄ also indicates that assimilation precedes the rule of merging, provided

that the latter applies also to r̄, as will be argued for below.
[més][r̄óbə] 'more clothing' results as [mér̄óbə], but also, in
more careful speech style, as [mézr̄ɔbə], or [méɹr̄óbə] (ɹ a fricative
untrilled r̄). If the only possible output of sr̄ were r̄, it would be
possible to suppose a rule sr̄ → Ør̄ in effect, but the variants zr̄,
ɹr̄ suggest that assimilation takes place first, optionally except for
voicing, and the rule of merging takes place once and just in case s
is totally assimilated to r̄.

The structural description of the rule assimilating nonstops
should refer to the sequence {s, z, š, ž}{s, z, š, ž, r̄}, given the
cases of assimilation presented above. The odd element in the second
class is r̄, but it could be naturally included in it if we character-
ize it as continuant. Further motivation for this characterization
will be given below, sections 4 and 6. As other high consonants,
namely ɲ and ŋ, r̄ does not assimilate: *Ba[r̄s]elona, pe[r̄] [ž]ugar*
'in order to play'.

$$(10) \quad \begin{bmatrix} +cont \\ +cor \\ -hi \end{bmatrix} \rightarrow \begin{bmatrix} \alpha ant \\ \beta distr \\ \gamma son \end{bmatrix} \;/\; \underline{\hspace{1cm}} \#_0 \begin{bmatrix} +cont \\ +cor \\ \alpha ant \\ \beta distr \\ \gamma son \end{bmatrix}$$

The (high) palatal lateral λ doesn't assimilate to a following
consonant, but l does:

$$(11) \quad \begin{array}{ll} e[\,l\,] & \text{'the'} \\ e[\,l\,]pa & \text{'the bread'} \\ e[\,l\,]foc & \text{'the fire'} \\ e[\,l\,]dia & \text{'the day'} \\ e[\,l\,]sol & \text{'the sun'} \\ e[\,l\,]ric & \text{'the rich'} \\ e[\,l,\,][\,ž\,]ermá & \text{'the brother'} \\ e[\,l,\,][\,\lambda\,]ibre & \text{'the book'} \\ e[\,ł\,]gos & \text{'the dog'} \end{array}$$

l assimilates to dentals, alveolars (vacuously), postalveolars, lamino-
palatals, palatals, and velars, but it doesn't assimilate the features
[hi] (like nasals and stops) nor [cor]. This means that before nonhigh
nonlabials there is complete point of articulation assimilation, but
before palatals and velars only partial assimilation: *e[l,][λ]ibre,
e[ł]gos* (l, being [-ant, +cor, -hi]; ł a velarized l, being [+bk, +cor,
-hi]).

$$(12) \quad \begin{bmatrix} +lat \\ -hi \end{bmatrix} \rightarrow \begin{bmatrix} \alpha bk \\ \beta ant \\ \gamma distr \end{bmatrix} \;/\; \underline{\hspace{1cm}} \#_0 \begin{bmatrix} +cons \\ -lab \\ \alpha bk \\ \beta ant \\ \gamma distr \end{bmatrix}$$

Notice that (12) is similar to the pair (4), (5) in that both don't assimilate the feature [hi]. Nonetheless nk results in ŋk, ŋ being [+hi], and lk in ɬk, ɬ being [-hi]. But [+hi] was assigned by linking convention to the assimilated nasal, and linking doesn't apply to the assimilated l which is coronal.

4. Distribution of r and r̄ and the rule of Contraction

Under "Contraction" I shall group a set of processes like the one described in the preceding section (merging of fricatives), having to do with the reduction of two segments to a single one.

As in other languages, two immediate occurrences of the same segment are resolved, in some cases, in a geminate, phonetically long, segment. Here are some examples:

(13) *cap porta*   káp:órtə   'no door'
     set trens   sét:réns   'seven trains'
     un nas   ún:ás   'a nose'
     el límit   əl:ímit   'the limit'
     ell llegeix   éλ:əžéš   'he reads'
     poc gust   póg:úst   'little taste'
     som molts   sóm:óls   'there are a lot of us'

As can be observed from the examples, there is gemination with stops, laterals and nasals. The rest of the consonants, i.e. continuants, affricates and r̄ are not subject to gemination when two identical instances of one of them occur. Thus the pairs of phrases in (14a) are phonetically distinct ([C] vs. [C:]), but those in (14b) are undistinguishable phonetically:

(14) a. pót está   pót təstá   b. u sén   us sén
        he can be   taste   it he hears/you

        un ús   un nús   ləz ónəs   ləs zónəs
        a use   knot   the waves   zones

        éλ uéš   éλ λuéš   mətéž ów   mətéž žów
        he hears   shines   same egg   yoke

There is also merging, as opposed to gemination, in the case of affricates, although here examples are scarce, especially due to the fact that word-initial affricates are scarce:

(15) *mosqui*[c], [c]*e-tse* ---→ *mosqui*[c]*e-tse*
     mosquitoes   tsetse

     mi[č], [č]*ec* -----→ *mi*[č]*ec*
     half   Czech

So far it is possible to distinguish the class of consonants that are
realized as geminate (stops) from the class that is reduced to a single
segment (fricatives and affricates). It appears that the same classi-
fication can be carried over sonorants. We saw in the preceding section
that r̄ was grouped with continuants in the environment of nonstop assim-
ilation (rule (10)), which correctly excluded nasals and laterals from
triggering assimilation. Here again manner of articulation determines
the kind of contraction that results, and laterals and nasals are
grouped together with stops, and r̄ with affricates and continuants.
But before we proceed, the distribution of [r̄] and [r] has to be exa-
mined. r̄ (trill) and r (flap) contrast intervocalically but are other-
wise neutralized. a) Morpheme initially, and therefore word initially,
only r̄ can appear; b) Word finally r appears before vowel, r̄ otherwise
(C or pause); c) Morpheme internally r̄ appears preconsonantally and
after l, n, s, and r after other consonants; d) They contrast, as
said, intervocalically, and are not found, as other liquids, between
consonants:

(16) a. [r̄]ítmic   'rhythmic'   b. pu[r̄]   'pure'
        a[r̄]ítmic   'arhythmic'   pu[r]íssim   'very pur'
        no [r̄]ítmic   'not rhythmic'   pu[r] alcohol 'pure alc'
        poc [r̄]ítmic   'little rhythmic'   pu[r̄] cafè   'pure cof'

     c. po[r̄]ta   'door'   d. ce[r]a   'wax'
        fol[r̄]ar   'to line'   se[r̄]a   'saw'
        hon[r̄]at   'honest'   ba[r]i   'Barium'
        Is[r̄]ael   'Israel'   ba[r̄]i   'neighbor'
        k[r]it   'scream'   co[r]al   'coral'
                                             co[r̄]al   'farmyard'

Whereas in intervocalic position there must be a contrast, in other po-
sitions the result can be predicted by rule. We could have in principle
rules r → r̄ or r̄ → r, in the appropriate contexts. Directionality
doesn't matter for morpheme internal cases, but consider pur. The final
liquid should be /r/ underlyingly since we have the feminine form [púr+ə]
(contrasting with, e.g., fem. [əskér̄+ə] 'left'). Therefore there must
be a rule converting this final /r/ into [r̄] in absolute final position
or before a consonant. And this same rule will account for the pre-
consonantal examples with [r̄] in (16c):

(17) r → r̄ / __ # [-syll]

Let's consider now the case of initial r̄ (16a). Whereas morpheme finally
there is a contrast, if a vowel follows ([púr+ə] vs. [əskér̄+ə]), morpheme
initially we find the trill r̄. There is however one exception, namely
the future and conditional morphemes /rá/, /ríə/, etc. Thus we have
[púrtə+rá] 'he will bring', [buλi+ríə] 'he would boil'. Future and
conditional forms involve stem and inflectional suffixes /rá/, /ríə/,
etc., whereas in cases like a[r̄]ítmic the root is preceded by a deriva-
tional prefix, and in this case the internal boundary should be # instead

of +. This choice has independent justification since morphological exceptions to Vowel Reduction had also # necessarily (Chapter 1, section 8) and they included prefixed words (Chapter 1, section 6). The r̄ appearing after l, n, s can be also included in the rule:

$$(18) \quad r \rightarrow \bar{r} \; / \; \# \; (X \begin{bmatrix} +cor \\ \left\{ \begin{matrix} +son \\ +cont \end{matrix} \right\} \end{bmatrix}) \; \underline{\quad}$$

Arguments against an alternative with underlying /r̄/ will be given directly. Now notice that (18), (and (17)) would violate the SCC. The solution that would be imposed by the SCC, namely a morpheme structure condition, is impracticable, since it would apply equally to [rímm] and the future marker [rá]. This apparent contradiction will be solved in favor of the SCC in the following paragraphs.

Having determined the distribution of r and r̄, we can find two cases where Contraction might apply, namely r̄##r̄, and r̄#r̄.[2]

(19)   má r̄   r̄óč   már̄óč   púr̄   r̄ealízmə   púr̄ealizmə
       sea   red   Red Sea   pure realism   pure realism

       intər̄éŋnə   cf. r̄éŋnə 'kingdom', intər̄pulá 'to interpolate'
       interregnum

       supər̄ealízmə cf. r̄ealízmə 'realism', supər̄sónik 'supersonic'
       superrealism

But contraction of [rr] is also possible if occurrences of inter-vocalic trilled [r̄] are considered to be underlying sequences /rr/, as Harris (1969), 50-51, does for Spanish, and Mascaró (1972), 47-49 and Wheeler (1974) 216-217 do for Catalan. I shall repeat and extend slightly the arguments offered in the two last references.

Contraction and the rules for the distribution of r and r̄ already predict that /rr/ will be realized as [r̄]. The first r in the sequence will become r̄ by (17), and the second will become r̄ by (18), since it follows a sonorant coronal. r̄r̄ being a sequence of continuants, it will be merged into r̄ by Contraction. Consider now the distribution of underlying /r/ and /r̄/ in word final position. Whereas ANY sonorant can appear word finally, r̄ cannot, but r can (the examples on the second column show the unchanged underlying sonorant):

(20)   ca[r̄]   'expensive'   ca[r]íssim   'very expensive'
        pu[r̄]   'pure'   pu[r]esa   'purity'
        moto[r̄]   'motor'   moto[r]isme 'motorism'
        esque[r̄ə]   'left'(masc.) esque[r̄]ans 'leftists'
        fe[r̄u]   'iron'   fé[r̄]ic   'ferric'
        co[r̄ə]   'he runs'   co[r̄]eria   'he would run'

be[λ]	'beautiful'	be[λ]íssim	'very beautiful'
rea[l]	'real'	rea[l]esa	'royalty'
autòno[m]	'autonomous'	autono[m]isme	'autonomism'
empe[ɲ]	'he pushes'	empe[ɲ]eria	'he would push'

The impossibility of underlying /r̄/ to appear word finally (which is perfectly general) could be handled by an ad hoc condition, but follows from independent generalization if its underlying form is /rr/ rather than /r̄/. To see this consider the realization of other geminate sonorants in final position:

(21)

ba[λλə]	'mayor'	ba[λλ]ia	'mayorship'
mo[λλə]	'mold'	emmo[λλ]em	'we mold'
pere[nnə]	'perennial'	pere[nn]itat	'perenniality'
su[mmə]	'supreme'	sú[mm]un	'maximum'

In these cases, like in the cases of final underlying /r̄/, the consonants don't ever appear in word final position. Instead, a vowel is inserted after them. To formulate the vowel insertion rule as operating after sequences of geminates and after r̄ would amount to losing a generalization that can be captured once intervocalic [r̄] is represented underlyingly as /rr/.

The fact that the opposition /r/~/r̄/ is neutralized everywhere except intervocalically can now be explained, too. Quite independently, sequences of liquids cannot appear except intervocalically. Thus we find pe[r̄l]a 'pearl', fa[ll]era 'anxious desire' bu[λλ]ofa 'blister' but no word with initial or final rl, ll, λλ, etc. or with one of these sequences preceded or followed by a consonant. If our previous /r̄/ is represented as /rr/ in intervocalic position, it follows--correctly-- that the same is true for this case.

Returning to rule (18) it is now clear that the SCC will no longer prevent it from operating since r̄ is no longer an underlying segment and therefore (18) is not neutralizing, hence not cyclic (see Introduction).

Contraction takes place also despite some minor differences between the two consonants. One case is the sequence šs (and, similarly, žz, čs, ǰz) mentioned at the beginning of section 3, where the difference is probably in the feature [ant]. Another case is the sequence stop-fricative where the result is an affricate: ca[p,]forat → ca[p͡f]orat 'no hole', se[d,][ǰž]ocs → se[ǰ]ocs 'seven plays' (cf. (6)). But an affricate is also formed from two affricates or the sequences stop-affricate and affricate-continuant. The consonant must, of course, be homorganic, either underlyingly or as a result of assimilation.

(22)

míč	čék	šík	tót
half	Czech	small	all

míččk	tóččk
míčík	tóčík

Affrication thus takes place when the sequence is [-cont], [+DR] (continuants being [+DR]). Otherwise the rule is the same as the one forming geminate stops or nongeminate fricatives. In all cases the segments have to be homorganic (except probably for [ant]). There is no natural way in the present framework to express the fact that the result of Contraction is a geminate if the two consonants are [-cont, -DR]; an affricate if they are [-cont], [+DR], respectively, a simple consonant if they are both [+cont], and that there is no contraction in the rest of the cases (i.e. [+DR], [-cont, -DR] and [+cont] [-cont]). I shall leave the question of how to represent what seems to be a natural process open, and state the rule as follows.

(23) A sequence of two homorganic (except for [ant]) consonants is contracted into a single segment in the following cases:

    a) two stops into a geminate stop
    b) two continuants into a single continuant
    c) a stop or an affricate followed by an affricate or a continuant into an affricate.

5. Assimilation, Contraction and the Cycle

The consideration of Contraction as a single phenomenon forces a specific solution to the problem that arises with the interaction between Contraction and Assimilation. Clearly the latter must precede the former, since, as has been justified in the preceding paragraphs, Contraction operates on homorganic clusters. Thus, we have [tótžók] → [tód,žók] → [tójók] but no contraction in [dós fóks]. Now consider the words [rəbóst+s] 'pantries' and [žəlát+s] 'chilly' (pl.). As the rules are formulated, in [rəbóstsžəláts] the word final s will assimilate to the following ž giving [rəbóstžžəláts] and Contraction will apply to žž yielding *[rəbóstžəláts]. If Assimilation is supposed to be iterative, the preceding t and s will be assimilated, and the final result will also be wrong: *[rəbóžžžəláts], or *[rəbóžd,žəláts]; even *[rəbóžžəláts] allowing Contraction to iterate also. The only way to get the correct output would be to restrict assimilation to the last two segments of the first word, allowing Contraction to iterate. We would then get stsž → sd,žž → sj, and the correct [rəbósjəláts]. But this solution is not only intuitively implausible, but actually wrong. Consider a case where no Contraction takes place, like [súks nəturáls] 'natural juices', which turns out phonetically [súkznəturáls].

Another alternative is to form first the affricate, i.e. stsž → scž, then assimilate the affricate to ž, → sjž, and form the final affricate → sj. But to do that, not only Contraction as a single process should be given up, but even a subpart of it, the formation of affricates should be split into two different rules one including ts → c, the other jž → j.

But if Assimilation and Contraction are allowed to apply cyclically, none of these problems arises, and the two rules can be kept at their initial generality, and the ordering Assimilation--Contraction preserved. Here is the derivation:

(24)   [[[r̄əbóst] s] [[žəlát] s]]
            2 1 0   10

1st ASS.	--	--
CDNTR.	rəbóšc	žəlác

2nd
ASS.   ǰ
CDNTR.   r̄ ə b ó s ǰ ə l á c

Notice that the cyclic application of these rules has also other consequences. After the second (final, in (24)) cycle, for example, the sequence of segments subject to the rules is sǰ. In the third cycle one would expect Assimilation to apply again to give *[r̄əbóžžə-lác]. But reapplication of Assimilation is prevented by the SCC, since Assimilation would make no specific use of information made available as a result of the third cycle.

6. Simplification of Consonant Clusters

Morpheme final or word final two consonant clusters are simplified by deleting the second consonant under certain conditions. The clusters in question consist of a sonorant or s^3 followed by a stop. Deletion of the stop depends on the nature of the cluster and its right environment. In (25) the effect of both factors, deletion (=DEL) or optional deletion (=(DEL)) is summarized (11 stands for pause. Clusters are represented with a voiceless stop, but voiced stops can appear also).

(25) CLUSTER

	(right) ENVIRONMENT					
	+V	#V	##V	##11	+C	#C	##C
mp, nt, lt	DEL	DEL	DEL			DEL	DEL
ŋk	(DEL)	DEL	DEL			DEL	DEL
rt	(DEL)	(DEL)	DEL			DEL	DEL
st	(DEL)	(DEL)				DEL	DEL
lp, lk, rp, rk, sp, sk							

To illustrate (25) with some examples, let's take the words *camp* 'field', *punt* 'point', *malalt* 'sick' (person), *banc* 'bench', *hort* 'orchard', *gust* 'taste', and as representatives of the last group, *serp* 'snake' and *disc* 'disc'. The environment +V is represented by the diminutive morpheme ét (feminine étə), +C by the plural morpheme s.

In word final position ##V will be illustrated by *és* 'is' and ##C by *sigui* 'is' (subjunctive).

(26)	+V	##V	##11	+C	##C
	kəmpét	kám és	kám	kám s	kám sígi
	puntét	pún és	pún	pún s	pún sígi
	məlaltét	məlál és	məlál	məlál s	məlál sígi
	bəŋkét	báŋ(k)és	báŋ	báŋ s	báŋ sígi
	uᵣtét	óᵣ(t)és	óᵣ(t)	óᵣ s	óᵣ sígi
	gustét	gús(t)és	gús(t)	gústs	gús sígi
	sərpetə	sérp és	sérp	sérps	sérpsígi
	diskét	dísk es	dísk	dísks	dísksígi

Before giving some examples for the environments with a single word boundary (#V and #C), let's recall that the three way distinction +/#/## is not set up merely for the purpose of describing the behavior of clusters in the situations presented above. First, in most cases the distinction is clear on syntactic grounds: ## separates major lexical categories, # clitics from words on which they cliticize, etc. But, in addition, the distinction +/#/## is also necessary to differentiate the three corresponding stress patterns examined in more detail in the first chapter: where X and Y are morphemes or words, in X+Y X might have an underlying stress which must be erased and which cannot affect Vowel Reduction. In X#Y the stress of X can be erased but affects Vowel Reduction, and in X##Y, X has a secondary stress. To repeat an example, compare [r̄əntə+dórə] 'washing machine', [r̄əntə#plác] 'dishwasher', and [r̄əntə##plác] 'he washes dishes' or [r̀əntə##dórə] 'he washes early'.

The following illustration of the environment #V and #C contains present participles or imperatives followed by clitics, and compounds with a single #, as shown by their unreduced unstressed vowel:

(27)	#V	intər̄ómp u	sant əndréw	súᵣt i	pɔstəlbəulár̄
		interrupt it	saint Andrew	go out there	postalveolar

	#C	intər̄óm lu	san simó	súᵣ li	pɔzdəntál
		him	Simon	to him	postdental

Returning to (25), it is clear that a following consonant, two word boundaries, and pause contribute to deletion. On the other hand, it is also clear that the nature of the stop alone does not determine deletion. Notice however that after Assimilation has applied, the first two groups of clusters in (25) are homorganic. Quite clearly, this is not the case for non-deletion cases lp, lk, rp, rk, sp, sk, where there is no assimilation. As for rt and st, they also have to be distinguished from the other groups. The second consonant cannot make the distinction, since t is in the set with obligatory deletion in most contexts (nt, lt), and in the set with optional deletion (rt, st). The first consonant of the cluster, however, is m, n, ŋ or l in the first set (1st and 2nd group

in (25)), and r̄ or s in the second set. This partition indicates once more that [+cont] should be assigned to r̄ (recall /r/ is realized [r̄] before C), and [-cont] to nasals and laterals, as has been argued earlier, sections 3 and 4. Let's then consider a possible formulation of the rule:

$$(28) \quad \begin{bmatrix} \text{-cont} \\ \alpha bk \\ \beta lab \end{bmatrix} \rightarrow \emptyset \; / \; \begin{bmatrix} \text{+cons} \\ \alpha bk \\ \beta lab \\ a\text{<-cont>} \end{bmatrix} \underline{\quad\quad} \left\{ \begin{matrix} \#_0 C \\ b\text{<\#\#>} \end{matrix} \right\} \quad \begin{matrix} \text{CONDITIONS:} \\ \text{a then b} \\ \text{~a, then b OPTIONAL} \end{matrix}$$

There are still two cases that are not correctly covered by the rule, namely the non-deletion in st+C (obligatory deletion predicted by (28)), and the optionality in the case of ŋk##V (obligatory deletion predicted by (28)). In the case of st+C, notice that the example presented in (26), and the only one known to me, is st+s in masculine nominals where s is the plural morpheme. Masculine nominals ending in st, sk or in a sibilant form the plural either by adding s or us. But whereas for sibilants us is added to oxytones and s to nonoxytones, for st and sk the normal solution is, in my own speech, us, the cases with s being unpredictable and exceptional. Along with gúst~gústus 'pleasure', tríst~trístus 'sad', λést~λéstus 'clever', bást~bástus 'vast', etc., we find uést~uésts 'West', dəzgást~dəzgásts 'wear', əgzáwst~əgzáwsts 'exhausted', rəbóst~rəbósts 'pantry'. The class of exceptions to stop deletion is then the same as the class of exceptions to the normal plural formation with *us*.

The second case, namely ŋk##V is more complex, since the presence of the stop is dependent on syntactic structure (e.g. ba[ŋk] *obre* 'the bank opens' but *si obre el* ba[ŋ∅] *obre la botiga* 'if opens the bank, opens the shop'). But sometimes instead of [k], [g] appears although /k/ was the underlying segment (cf. [bəŋké] 'banker') *el* ba[ŋg] *obre* (cf. Badia (1951), 110). This suggests that k or g are deleted regularly after ŋ, as our rule predicts, and that a different rule inserts g between ŋ and V, in some contexts.

7. Assimilation of Nasals and Cluster Simplification

The discussion of the preceding sections assumed a given ordering between the rules of Assimilation (at least Assimilation of nasals) and Cluster Simplification. This is so because the notion "homorganic cluster" was used to characterize the clusters that underwent Simplification, and it was formally expressed in the rule itself. That is, those clusters whose members were homorganic either underlyingly (nt, lt, rt, st) or as a result of Assimilation (mp, ŋk), underwent Simplification, but those that were not didn't. The ordering should therefore be Assimilation~Simplification. Furthermore, in the cases where

both Assimilation and Simplification apply, if the latter were to apply before the former, the consonant that triggers Assimilation would be no longer present at the time this rule applies. The two cases where this can occur are np → mp → m and nk → ŋk → ŋ. It could be argued that words ending in /np/ have really underlying /mp/, in fact a requirement of the SCC. But this is not the case for nk, since there is no independent underlying ŋ in Catalan (see section 2). Moreover there is a set of cases where nk is a derived sequence. Consider the following verb forms:

(29)

		3rd Sg Pst Ind	2nd Sg Prs Ind	3rd Sg Prs Ind	1st Sg Prs Ind
a.	'to cost'	bəlíə	báls	bál	bálk
	'to grind'	mulíə	móls	mól	mólk
b.	'to sell'	bəníə	béns	bén	béŋ
	'to melt'	funíə	fóns	fón	fóŋ

The 1st Sg Pres Indicative in (29a) are formed with the verb roots bál, mól, by adding k; the same thing happens with bén, fón in (29b), but there Assimilation and Simplification apply giving the derivations bénk ---→ béŋk ---→ béŋ, and fónk ---→ fóŋk ---→ fóŋ.

Let's consider now cases with a nasal-stop cluster followed by another consonant. The output of our rules would be a nasal assimilated to the point of articulation of the stop, followed by the other consonant, i.e. $NC_1C_2 → N_1C_2$. But the result is different:

(30)
bintέ	bín	bím	pans	bin,	šays
'twentieth'	'twenty'	'twenty'	'breads'	'twenty'	'lambs'

fént	u	fén	fέm	mə	fén,	λúm
'doing'	'it'	'doing'	'doing'	'to me'	'doing'	'light'

bíŋ	káps	féŋ	gas
'twenty'	'heads'	'doing'	'gas'

The first column indicates that the underlying forms are /bínt/ and /fént/, t not being deleted because of the following vowel (cf. sέt 'seven' satέ 'seventh', fέm 'let's do', fέmu 'let's do it'). In the rest of the cases the t is deleted because it is word final or followed by a consonant. But the nasal shows up homorganic, not with the deleted stop, but with the following consonant. For these cases an ordering reverse of that suggested before would work. The ordering conflict can be illustrated with the sentence *venc vint pans* 'I sell twenty bread loaves'.

(31) ASS. -- SIMPL. SIMPL. -- ASS.

	bénk bínt páns			bénk bínt páns
	ŋ ň	SIMPL.	Ø Ø	
ASS.		ASS.	m m	
SIMPL.	Ø Ø		*bém bím páns	
	béŋ *bíŋ páns			

Let's consider two possible ways of overcoming the ordering prob-
lem. One solution would consist of having two separate rules of nasal
assimilation, one assimilating them to velars, the other to any point
of articulation, and order in between them the rule of Cluster Simpli-
fication. We then would have the derivation bénk bínt páns → béŋk bínt
páns → béŋ bín páns → béŋ bím páns. A second solution would keep the
previous rules, but extend nasal assimilation so as to assimilate n to
a consonant C_1 in the environment __(t)#$_0$$C_1$, that is allowing an inter-
vening t (or d) between them. The derivation would be bénk bínt páns →
béŋk bímt páns → béŋ bím páns. Notice that Simplification would have
to be modified since it has to delete t in the nonhomorganic cluster mt.

Although these alternatives are technically feasable, they share
a common drawback, namely the loss of a generalization. In addition to
the lack of any evidence in favor of splitting Assimilation in the way
presented, or modifying both Assimilation and Simplification, there is
loss of a generalization in each case. In the first solution Assimila-
tion of nasals (in particular assimilation to velars) has to be stated
twice. This is clearly seen in bénk bínt gáts 'I sell twenty cats'
where n has to be assimilated to k by the first rule, before k is dele-
ted, and the second n to g, after t has been deleted. In the second
alternative the proposed modification of Assimilation merely takes into
account the fact that the intervening t or d is going to be deleted by
a later rule, and with that "in mind" assimilates nasals to the other
consonant. Moreover the generalization that Simplification takes place
if the cluster is homorganic can no longer be captured.

More generally, what ANY solution has to do, more or less surrep-
titiously, is to state the same process twice. This, however, does not
by itself imply that there is a loss of a generalization. This will
only happen if the GRAMMAR states the process twice, not if by (uni-
versal) convention a process stated once applies twice. But to go on
and stipulate that there exists some convention that lets rules apply
twice in cases like the one under discussion, would be simply to be
begging the question. There is however an INDEPENDENT universal
type of rule application, namely the cycle, that gives the desired
result. The original rules and ordering that were justified previously
can be kept unchanged. Here is the derivation of our illustrative exam-
ple (#'s ommitted):

(32)   [[[bɛ́n]k] [[bínt][páns]]]
         2 1 0   1 0   0

1st
ASS.   ŋ   — —   — —
SIMP.   Ø   Ø   — —
         ‾‾‾‾‾‾‾   ‾‾‾‾‾ ‾‾‾‾‾
           bɛ́ŋ   bín   páns

2nd
ASS.   —   m
SIMP.   —   —
         ‾‾‾‾‾‾‾   ‾‾‾‾‾ ‾‾‾‾‾
           bɛ́ŋ   bím   páns

In the first cycle the rules apply at word level giving as output what would be the phonetic form of the words in isolation. On the second cycle the process of assimilation takes place again. Notice that re-application of assimilation does not violate the SCC. In the third cycle no rule would apply since Assimilation of nasals only applies to coronals and labials, hence not to ŋ.

There is still a problem left. The rules as stated predict that after the loss of the stop as a result of Simplification the preceding consonant should retain the point of articulation of the deleted stop (unless further assimilation takes place). This is true, as we have seen, for ŋ from /nk/. But in other cases the prediction is wrong:

(33)   púnt 'point'   məláit 'sick'

ASS.   . ŋ   l̪
SIMP.   ^ Ø   ^ Ø
          *púṇ   *məlá l̪
                                       ^

Instead we get [pún] and [məláı] with alveolar, and not dental l, n. The underlying forms must be /púnt/, /məláit/ as shown by (26). The problem here is similar to the preceding one. The reverse ordering would give the right result: púnt (SIMP) → pún (ASS, inapplicable) → pún. But notice that here the situation is slightly different. The opposite orderings are necessary, bánk (ASS.) → báŋk (SIMP) → báŋ and púnt (SIMP) → pún (ASS, inappl.) → pún, but both within the same cycle. Thus no cyclic solution will make any difference. Consider however the rules proposed to account for nasal assimilation, (4) and (5) repeated here as (34) and (35):

(34) $\begin{bmatrix} +nas \\ +cor \end{bmatrix}$ → $\begin{bmatrix} \alpha bk \\ \beta lab \\ \gamma ant \\ \delta cor \\ \varepsilon distr \end{bmatrix}$ / ___ #$_0$ $\begin{bmatrix} +cons \\ \alpha bk \\ \beta lab \\ \gamma ant \\ \delta cor \\ \varepsilon distr \end{bmatrix}$

(35) $\begin{bmatrix} +nas \\ +lab \end{bmatrix}$ → [+distr] / ___ #$_0$ $\begin{bmatrix} +cons \\ +lab \\ +distr \end{bmatrix}$

They are difficult to collapse, because n assimilates [lab] and m assimilates only to a labial, so both [βlab] and [+lab] have to be present in the rule. There is however another possible formulation with two rules, where the first one is simplified by eliminating the feature [distr]:

$$(36) \quad \begin{bmatrix} +\text{nas} \\ +\text{cor} \end{bmatrix} \rightarrow \begin{bmatrix} \alpha\text{bk} \\ \beta\text{lab} \\ \gamma\text{cor} \\ \delta\text{ant} \end{bmatrix} / \underline{\quad} \#_0 \begin{bmatrix} +\text{cons} \\ \alpha\text{bk} \\ \beta\text{lab} \\ \gamma\text{cor} \\ \delta\text{ant} \end{bmatrix} \quad \text{ASSIMILATION OF NASALS}$$

$$(37) \quad \begin{bmatrix} +\text{nas} \\ -\text{hi} \\ \alpha\text{lab} \end{bmatrix} \rightarrow [\beta\text{distr}] / \underline{\quad} \#_0 \begin{bmatrix} +\text{cons} \\ \beta\text{distr} \\ \alpha\text{lab} \end{bmatrix} \quad \text{NASAL ADJUSTMENT}$$

Under this formulation, first n assimilates to "major" points of articulation, and then m and n undergo a "minor" adjustment in point of articulation when the following when the following consonant is already partly homorganic with the following consonant (i.e. mf→ ɱf, nt → ṇt, but not mt → *ṃt, etc.) (37) is a more "phonetic" rule, never causing neutralization of underlying distinctions, and should be noncyclic, according to the conclusion reached in the Introduction. It applies therefore after all cyclic rules have applied, therefore after (36). This gives the correct result for [pún]. The general Assimilation rule (36) will apply before Simplification, and Nasal Adjustment (37) after the latter. So we shall have púnt (ASS, vacuous) → púnt (SIMPL) → pún (ADJUST, inappl.) → pún, but diminutive [puntét] by puntét (ASS, vacuous) → puntét (SIMP, inappl.) → puntét (ADJUST) → puṇtét.

I repeat some of the examples, with the rules proposed.

(38)
$$[[[bέn]k][bínt][[pínt\text{ə}]s]]] \quad [[púnt]]$$
$$_{210} \qquad _{10} \qquad _{10}\text{'combs'} \qquad _{10}$$

1st ASS.	ŋ	‾	‾	‾
SIMP.	Ø bέŋ	Ø bín	‾ píntəs	Ø pún
2nd ASS.		m		
SIMP.		‾‾‾‾ bím	píntəs	
3rd ASS.		‾‾‾‾‾		
SIMP.	bέŋ	‾‾‾‾‾ bím	píntəs	

--→ (ADJ.) bέŋ bím píṇtəs

8. N-Deletion

In most morphemes, a final n doesn't appear when it is word final, but appears elsewhere:

(39)

sg.	plural	derivative
plá 'even'	plán+s	plən+ísim 'very even'
kuzí 'cousin'	kuzín+s	kuzin+ét 'small cousin'
šil+é 'Chilean'	šil+én+s	šil+ən+ízmə 'Chileanism'
upur̄tú 'opportune'	upur̄tún+s	upur̄tun+itát 'opportunity'
distribu+syó 'distribution'	distribu+syón+s	distribu+syun+ál 'distributional'

However, not every word final n is deleted. In (39) already, all contexts of deletion are V̆ ##. After a consonant or proparoxytones there is no deletion: [kárn] 'meat', [kuntórn] 'contour', [əspésimən] 'specimen', [ipérbətun] 'hyperbaton'. After an unstressed vowel in paroxytones n is normally retained, but there seem to be also cases of deletion. Thus besides [átun] 'atonic', [urížən] 'origin', [əgzámən] 'examination', and the majority of paroxytones, we find the following eleven cases in (40a) (from Fabra (1968), 110; examples in orthographic form):[6]

(40)

a.	b.	c. plurals
jove 'young'	*joven̪íssim* 'very young'	*joves*
home 'man'	*homenet* 'small man'	*homes*
orfe 'orphan'	*orfenet* 'small orphan'	*orfes*
ase 'donkey'	*asenet* 'small donkey'	*ases*
freixe 'ash tree'	*freixeneda* 'ash tree plantation'	*freixes*
rave 'radish'	*ravenar* 'radish field'	*raves*

(40, cont.)

a.	b.	c. plurals
cove 'pannier'	*covenada* 'pannier load'	*coves*
argue 'winding machine'	*arguenell* 'fishing machine with pulley'	*argues*
orgue 'organ'	*organista* 'organist'	*orgues*
marge 'margin'	*marginal* 'marginal'	*marges*
terme 'limit'	*terminal* 'terminal'	*termes*

The derivatives in b) are all in the *Diccionari General* (=Fabra (1932)), but some of them (*asenet, freixeneda, covenada, arguenell*, as well as *argue*) are not familiar in my own idiolect. Even putting aside this fact, there is a very clear cut distinction between (39) and (40). In (39), n is not present if it is word final, but appears elsewhere. In (40) on the other side, n doesn't show up word finally, and in general in any flexionally related forms, it appears on derivationally related forms.

But the normal case of deletion, $\acute{V}$ __ ##, has also exceptions:

(41) a.

	plural	derivatives
són 'sleep, sleepiness'	sóns	sunétə 'small sleep'
žuán 'John'	žuáns	žuanét 'little John'
ərán 'close'		ərəná 'to cut close, short'
uzón 'ozone'	uzóns	uzónik 'ozonic'
žén 'gene'	žéns	ženutípus 'genotype'
səgón 'second'	səgóns	

(41, cont.)

    b.

ún 'one', (fem. únə)	ú '(number) one' (pl. úns)
əlgún 'some' (fem. əlgúnə)	əlgú 'someone'
miǰán 'middle'	miǰá 'middle' (fem. miǰánə)
bɔ́n 'good' (fem. bɔ́nə)	bɔ́ 'good' (fem. bɔ́nə)
bén 'well' (cf. benəstá 'well-being')	bé 'well'
kín 'which' (fem. kínə)	kí 'who'

(41a) are simply exceptions to N-deletion that cannot be characterized but idiosyncratically. The examples in the first column of (41b) are interesting in that they are closely related to identical words (second column in (41b)) that undergo deletion regularly. Non-deletion occurs when the words in question are modifiers preceding the modified head, i.e., determiners or adjectives preceding N or NP, or adverbs preceding participles or adjectives. It is worth noting that this includes the case when the head has been deleted, or left unfilled lexically. Sentences are in orthographic form:

(42)   *Tinc un llibre. En tinc un*   *Compta des de u_*
       I have one book.   PRO I have one   Count from one.
                      (of them)

    Algun amic t'ajudarà. *Algun t'ajudarà.* *Algu_ t'ajudarà.*
    Some friend will help some will help someone will help you
           you   (of them)   you

    Vindré a mitjan agost.   *Faré el curs mitjà_*
    I'll come in the middle of I'll do the course middle
              August

    És un bon lloc   *El lloc és bo_*
    It's a good place   the place is good

    Està ben fet.   *Ho han fet bé_.*
    It's well done   it they've done well

    Quin equip juga?   *Quin juga?* *qui_ juga?*
    which team plays   which plays who plays
                  (of them)

    But there is a number of adjectives that can appear before the head and nevertheless show regular N-deletion word finally, as witnessed by the contrast between feminine and masculine forms:

(43) <u>masculine</u>   <u>feminine</u>

ple   *estiu*   *plena*   *primavera*
full, midst   summer   spring
    of

el cinquè dia   *la cinquena setmana*
the fifth   day   the   week

el comú interès   *la comuna causa*
the common interest   cause

el diví   càstig   *la divina justicia*
the divine punishment   justice

el vei   *Portugal*   *la veïna Franca*
the neighbor- Portugal   France
        ing

These examples suggest that unless there is some property distinguishing
(41b) and (43), which seems not to be the case, the prehead modifiers
of (41b) are lexically marked so as not to undergo N-deletion. That is,
they belong to the same class as (41a). This raises the question of why
should they be exceptions just when they appear in prehead position.
But there are independent reasons to believe that prehead variants are
separate lexical entries, since they share different syntactic and seman-
tic properties from the head or posthead variants. First of all, not all
adjectives can appear before the head; *u* refers only to the number 1;
algú and *qui* are necessarily human, but *algún* and *quin* can be nonhuman;
mitjan is only used in the expression *a mitjan de*, before masculine time
nouns or noun phrases (e.g. **a mitjan camí* 'in the middle of the way';
*a mitjana setmana (fem.) 'at the middle of the week').

To summarize, we have five types of cases: after stressed vowel
a) normally, deletion, b) exceptionally, non-deletion; after unstressed
vowel, c) normally, non-deletion, d) exceptionally, deletion in flexion;
after C e) regular non-deletion:

(44)   <u>-##</u>   <u>-+s##(plural)</u>   <u>-+[derivat. suff.]</u>

     a. plá   pláns   plənísim

     b. són   sóns   sunétə

     c. átun   átuns   ətunisitát

     d. žóbə   žóbəs   žubənét

     e. kárn   kárns   kərnétə

d) can be excluded from the N-deletion rule by letting it apply in the context V__##, and morphemes in the class b) can be marked as exceptions to this rule.

One way to treat the remaining cases, c) and d), would be to extend deletion to the context V __ +s, to have [žóbən+s] → [žóbə+s], and mark [átun] and similar cases as exceptions to the rule. First of all, the context V __ +s is wrong, since we have derivatives like [žubən+sá] 'young' [žubən+séλ] 'youngster'. Of course the rule could be modified so as to apply only before the plural marker s, i.e., in the context

V __ <s> ##.
<-str>

But the major problem with such an analysis is that it treats d) as regular cases and c) as exceptions, while the latter are in fact the rule, and d) is reduced to the few examples in (40). The right solution is, I think, to have the rule apply in the context V __ ##, thus excluding correctly c) and e), and treat the alternations in d) like [žóbə]~[žubənét] as idiosyncratic. That is to say that the morpheme for 'young' has two allomorphic variants, žóbə and žóbən. The noun žóbə has the first variant, and forms the plural [žóbəs] regularly by adding s. The diminutive and other derivatives have the second variant with n: [žubənét], [žubəntút] 'youth'. One consequence of this analysis is that it would be possible that in the cases of allomorphy the variant without n appeared in nonfinal position and the variant with n in final position, i.e., the reverse of the rule-governed cases. At least the first case can be attested. [ómə] 'man' forms an adjectival derivative, not with the variant ómən (like in [umən+ét]) but with a variant without n: [umá] (cf. [bósk] 'forest', [buská] 'silvester', [λúɲ] 'far' (adverb), [λuɲá] 'far' (adj.); for ə deletion, cf. bízb 'bishop' bizbát). And from [žóbə], there is the derivative [žubén]. é, and therefore n must belong to the suffix, otherwise the stress wouldn't be explained. On the other hand, the existence of suppletion of the kind presented in (40) is independently attested in the language. Consider the regular derivations from a) to b) with those from c) to d) in (45):

(45)	a)	b)	c)	d)
	λét	λətérə	kəfɛ́	kəfətérə
	milk	milk can	coffee	coffee pot
	žənóλ	žənuλérə	pít	pitrérə
	knee	knee guard	chest	bosom
	méksik	məksiká	bérgə	bərgədá
	Mexico	Mexican	name of town	inhabitant of b.
	flúš	flušəža	tú	tutəžá
	weak	to weaken	you	to address someone with 'tu' (as opposed to polite bustɛ́)

(Cont., 45)

a)	b)	c)	d)
fúm smoke	fumós smoky	pédrə stone	pədrəgós rocky
mórtu snout	murál nosebag	káp head	kəpsál bedhead

The words in (45c) show the same pattern as (40): plurals are [kəfés], [píts], [bérgəs], [tús], [pédrəs], [káps]. In addition the extra consonant is not present regularly in all derivatives: [kəfaínə] 'caffeine', [pitét] 'small chest, bib', [férik] 'ferric', [pədrétə] 'small stone').

It might still be argued that the examples in (40) are different from (45c, d) because, first, they are a larger set showing the same additional consonant, and second, because this alternation is related to an independently motivated phonological rule, N-deletion, whereas there are no independent rules deleting t, r (at least after C), d or g.

It would be certainly useless to claim that those facts--the alternations in (40)--are accidental. Yet to include them under the rule of N-deletion would mean to have to allow rules to have so-called "positive" exceptions: /žóbən/ and /žóbənts/ would have to undergo the rule, even though they wouldn't meet its structural description, because of the preceding unstressed vowel. The structural description has to contain a stressed vowel, since otherwise the n would be incorrectly deleted in the regular cases ([urížən], etc.) where it stays. And there are other reasons, as we have seen, to believe that the alternation is present underlyingly.

This apparent contradiction vanishes once it is realized that the fact that a given regularity exists doesn't entail that it should be accounted for by the grammar. It is on the contrary the notion "grammar" or "possible grammar" that defines what a linguistic regularity is. The arguments given above suggest that the alternation -n~-Ø is a phonological regularity for (39) but not for (40). Yet the number of items affected by the alternation in (40) suggests that its existence is not accidental. They are indeed the result of some rules once operative in the grammar. A word like [ómə] originated from Latin HOMINEM to a stage where [ómen] and pl. [ómens] der. [ómen--] coexisted. The rule deleting n operated after stressed and unstressed vowels to give Old Catalan [óme]~[ómens]~[ómen]+der. suf. (Coromines (1971), 313-314), a system still found in occidental and southern dialects. Another process reduced ns to s in some cases to give [ómé]~[ómes]~[ómen]+der. suf. At this stage the rule was modified so as to apply only after stressed vowels, as words introduced later in the language ending in Vn ([urížən], etc.) witness.

N-deletion will have therefore the following form:

$$(46) \quad \begin{bmatrix} +nas \\ +cor \end{bmatrix} \rightarrow \emptyset \ / \ \begin{bmatrix} +syll \\ +str \end{bmatrix} \_\_ \#\#$$

9. R-Deletion

Consider the following adjectives in their masculine and feminine forms.

(47)		masc.	fem.	masc.		fem.
	a.	nú 'naked'	nuə	tót	'all'	tótə
	b.	fí 'fine'	fínə	sá	'sane'	sánə
	c.	dú 'hard'	dúrə	primé	'first'	primérə
	d.	púr̄ 'pure'	púrə	sunór̄	'sonor- ous'	sunórə
	e.	kúr̄ 'short'	kúr̄tə	fár̄	'fed up'	fár̄tə

Class a), like the majority of adjectives, forms the feminine by adding the morpheme ə, but the same can be said of other cases. In d) the alternation r̄~r in masc. and fem. is predicted by rule (17), and b) and e) will have underlying forms like /fín/--/fínə/ and /kúrt/--/kúrtə/. The masculine phonetic forms [fí] and [kur̄] (or [kur̄t], since in this case (28) is optional) will be predicted by the rules of N-deletion (46) and Cluster Simplification (28), respectively. Similarly, a rule of final R-deletion would account for [dú], [primé] from underlying /dúr/, /primér/. The situation for final r is partially parallel to the one of final n discussed in the preceding section. The majority of final r's are deleted, but there are also numerous exceptions. These words with word final phonetic r̄ that are exceptions to R-deletion should not be confused with those arising from r̄t → r̄ by Cluster Simplification. They are distinguished in words where r̄ is followed by another morpheme beginning with a vowel, since there the t is not deleted (cf. [púrə] vs. [kur̄tə] in (47)), and also because Cluster Simplification applies optionally to r̄t: [kúr̄], [kúr̄t] but [púr̄], *[pur̄t].

So far the cases of deletion presented suggest an environment V̇ __ ##. r never appears after a consonant word finally, but instead of deletion what happens in cases of underlying Cr is insertion of epenthetic ə. The verbal root bát 'beat', when added the infinitive marker r becomes [bátrə]; see Chapter 3, section 2, and rule (11). If R-deletion operated after ə-Insertion it could be formulated applying just before ##. But the nonoxytone words with final r would disqualify such an approach:

(48)
šófə̄r	'chauffeur'	mízə̄r	'miserable'
fósfur̄	'phosphorus'	sátir̄	'satyr'
murtífə̄r	'deadly'	əfímə̄r	'ephimer'
zéfir̄	'zephyr'	səmáfur̄	'traffic light'
útə̄r	'uterus'	əlmíbə̄r	'syrup'
kər̄níbur̄	'carnivorous'	žúpitə̄r	'Jupiter'

As the examples in (48) show, paroxytones and proparoxytones conserve their final r. There is a single exception, [kánti] 'jug', diminutive [kəntirét]. This alternation can be included in the class of lexical alternations already discussed (cf. (40) and (45c, d)), and excluded from the scope of R-deletion. It should be made clear that this kind of move is not equivalent to allowing rules to have "positive exceptions". Although it allows some degree of irregularity it confines it to a specific place in the grammar, namely the lexicon where, in addition, most idiosyncracies are lodged anyway.

Unlike n, r is also deleted before the plural marker s, exactly in those cases where it is deleted also word finally.

(49)

		plural	feminine	
dú	'hard'	dús	dúrə	
klá	'clear'	klás	klárə	
pižó	'worse'	pižós	---	cf. əmpižurá 'to get worse'
sənsέ	'whole'	sənsέs	sənsέrə	
kuló	'color'	kulós	---	dim. kulurét
pəpέ	'paper'	pəpés	---	dim. pəpərét
pintá	'to paint'	---	pintár u	'to paint it'
			pintár̄sə	'to paint oneself'
			pintálzi	'to paint to them'

The deletion before plural s does not make these cases similar to those in (40) which were excluded from the rule of N-deletion. First, those in (49) are far from exceptional, and second, they have, as expected, their r appearing when there is a feminine form, or when a clitic beginning with a vowel or a single consonant follows. So R-deletion will have the following form:

(50) $\begin{bmatrix} +son \\ -lat \\ -nas \end{bmatrix} \rightarrow \emptyset \ / \ \begin{bmatrix} +syll \\ +str \end{bmatrix} \underline{\quad\quad} (+ \begin{bmatrix} +cont \\ +cor \end{bmatrix}) \ \# \ \begin{Bmatrix} \# \\ CC \end{Bmatrix}$

This formulation of the rule being justified, it provides an argument for the analysis of Future and Conditional in Chapter 1. The infinitive morpheme is r for all verbs. This r gets deleted by (50) unless a clitic beginning with a vowel or a single consonant follows, as illustrated in (49). When the verbal stem ends in a consonant, in most cases an epenthetic ə is inserted, as said, after the r: [bát] (stem), [bátrə] 'to beat', [káb]~[kábrə] 'to fit in', [káw]~[káwrə] 'to fall'. But after m, ɲ, š, rr, rs and ns, apparently ə is inserted between the stem and the infinitive marker r, as the following verbs, in orthographic form, show (ny= [ɲ], ix= [š]): *témer* 'to fear', *plànyer* 'to pity', *córrer* 'to run', *tòrcer* 'to twist', *vèncer* 'to win'. If ə is inserted in these cases, R-deletion will not apply, since the inserted vowel preceding r is unstressed. But whereas the "inserted" vowel always stays, the final r appears to be deleted. This analysis conflicts with our decision to restrict R-deletion to apply after stressed vowels. But the analysis seems to be incorrect. In fact r not only deletes word finally or before a clitic beginning with two consonants, but it deletes everywhere, i.e. it never shows up:

(51)

-##	-#I 'him'	-#u 'it'[7]
témə	téməl	téməw
plápə	plápəl	plápəw
kunéšə	kunéšəl	kunéšəw
kórrə	kórrəl	kórrɛw
tórsə	tórsəl	tórsəw
bénsə	bénsəl	bénsəw

We are forced therefore to set up a different morpheme for the infinitive in these cases, namely ə. Otherwise, not only would rule (50) have to be extended to apply after unstressed vowels in verbs, but even in right environments where the general rule never applies. In fact it could be formulated as "delete the infinitive marker r everywhere, in verbs whose stem ends in m, ɲ, š, rr, rs, ns".

The more plausible solution with a separate marker ə for these cases is consistent with the treatment of future and conditional adopted in Chapter 1. But the other alternative discussed there is incompatible with it. This alternative claimed that a future form like [pintaré] is formed by an infinitive and inflected auxiliary verb, i.e. $[_V[_{INF}$pintar]e].

If this were true the future and conditional of the verbs in (51) would be *[təməé], *[təməíə], *[kunəšəé], *[kunəšəíə]; etc. The solution adopted in Chapter 1, on the other hand, sets up future and conditional markers /ré/, etc., /ríə/, etc., respectively, and predicts the correct forms. See also Chapter 3, section 4.

(52)   <u>Future</u> (1st Sg.)   <u>Conditional</u> (1st Sg.)

təməré	təməríə
pləpəré	pləpəríə
kunəšəré	kunəšəríə
kuɾəré	kuɾəríə
tuɾsəré	tuɾsəríə
bənsəré	bənsəríə

10. B to Glide

A large number of items show an alternation between postvocalic [w] and intervocalic obstruents, mainly [b].

(53)   a.   tów   'soft'   tóbə   (fem.)

      b.   péw   'foot'   pədéstrə   'on foot' (adj.)

      c.   pəláw   'palace'   pələtí   'palatine'

      d.   pəɾdíw   'partridge'   pəɾdigót   'male partridge'

      e.   déw   'ten'   dəkágun   'decagon'

      f.   préw   'price'   dəprəsyá   'to depreciate'

(53) can be divided into two groups. The first group, exemplified by a) has a large number of alternations w~b and only a few exceptions (i.e. intervocalic b that doesn't show up as w in word final position); see Lleó and Mascaró (1973) for details. The second group (53b-f) has a limited number of alternations, and, in most cases an intervocalic obstruent d, t, g, k, s shows up (devoiced) in word final position without turning to w. Furthermore in some of the derivatives of examples like (53b-f) w shows up instead of the obstruent: [pəwét] 'small foot', [pəɾdiwásə] 'big partridge', [prəwá] 'to price'.

Lleó and Mascaró (1973) propose rules of glide formation from b, t→d, and k→g to account for these alternations, assigning to the last two the character of "minor" or "morphological" rules; cases like (53f) are the result of two rules, t → w and t → s. But examples like [pəwét] suggest that these cases have two roots (e.g. /préw/ and /prés/), and that a rule is only operative in the case of b.

Some of the cases where b doesn't become a glide can be excluded by the rule. Consider the following examples:

(54) a. nów   'new'   nóbə   (fem.)

          bíw   'alive'   bíbə   (fem.)

          bláw   'blue'   bləbísim   'very blue'

          žuéw   'jewish'   žuébə   (fem.)

      b. búlp   'bulb'   bulbós   'bulbous'

          bérp   'snake'   bərbál   'verbal'

          árəp   'Arabic'   ərábik   'Arab'

          bisíləp   'disyllabic'   bisilábik   'disyllabic'

If the rule is formulated to apply after a stressed vowel, the cases in (54) with final p instead of w will be correctly excluded. The rule should also apply before a plural s, but not before any consonant:

(55)   Plural

      nów   'new'   nóws

      tów   'soft'   tóws

      bláw   'blue'   bláws

      líbrə   'book'

      móplə   'piece of fur-   mubilyári   'furniture'
                 niture'
      ədeptáplə 'adaptable'   ədeptəbilitat 'adaptability'

      əskriptó   'writer'   əskribén   'copyist, clerk'

B to Glide can therefore be formulated as follows:

(56) $\begin{bmatrix} -son \\ +lab \\ +voice \end{bmatrix} \rightarrow [-cons] / \begin{bmatrix} +syll \\ +stress \end{bmatrix} \underline{\quad} (C) \#\#$

CHAPTER THREE: VERBAL MORPHOLOGY

1. The Verbal System

Most of the material discussed in the two previous chapters dealt with nominal phonology, although other categories were also mentioned and discussed. The object of this chapter is threefold. First, to present an analysis of Catalan Verb Morphology that moves towards the goal of achieving descriptive adequacy. Second, to determine what contributions such an analysis can make to linguistic theory, in this particular case to try to give a characterization of the rules that operate on phonological representations. In the third place, to test the conclusions, both theoretical and descriptive, reached in the first two chapters: the theory of underlying stress, several of the rules proposed, the distinction made about derived and underlying regularities, and the Strict Cycle Condition.

Catalan has an inflecting verbal system which consists of seven finite simple tenses, three nonfinite forms, and several tenses formed by an auxiliary verb and a verb in nonfinite form. Among the simple tenses, there are two presents and two pasts (indicative and subjunctive), a future, a conditional, and the imperative. The nonfinite forms are the (past) participle, the gerund (or present participle) and the infinitive. The participle can be inflected for gender and number like adjectives, and is, not surprisingly, the most irregular of all forms. The tense called "passé simple", "passato remoto", "pretérito indefinido" in other Romance languages is confined to literary use in the dialect under study, at least as a simple form, since there is a completely equivalent form with the verb "vaig" (see section 9 and Appendix II) + infinitive. I shall therefore not include it in my presentation. The imperative has all but the first person singular. Third person forms are used to address the hearer in the polite form, so they might be regarded as second person forms, but morphologically they are identical to third person forms. Since the third person singular and the first plural always are identical in the imperative to the same persons in the present subjunctive, I shall omit them in the paradigms and in the discussion. I shall follow the traditional grammars in distinguishing three conjugations: I, II and III (IIIa and IIIb). In addition to the distinction within III, I shall introduce a classification of II in groups and subgroups for convenience, especially among what we might call the "subregular" verbs. Verbs will be named by their infinitive in standard orthographic form. The verbal forms (the inflected forms) will be always in phonetic transcription omitting a few details (minor assimilations). To make distinctions between morphemes possible, the Imperative second and third plural persons, the Infinitive and the gerund will be transcribed as if a clitic beginning with a vowel followed so that rules applying to word final segment won't obscure the form of the morphemes. Similarly the participle will

be transcribed as if the feminine marker ə followed. Thus we shall find [féz], [fážint], [fént], [fér], [mirád], instead of the phonetic form of these words in isolation which is [fés], [fážin], [fén], [fé], [mirát], as predicted by the rules discussed in Chapter 2, and the general process of devoicing of final obstruents. The tenses and persons will be abbreviated as follows:

Present Indicative:	PI	1st singular:	1
Imperfective Indicative:	II	2nd singular:	2
Present Subjunctive:	PS	3rd singular:	3
Imperfective Subjunctive:	IS	1st plural:	4
Future:	F	2nd plural:	5
Conditional:	C	3rd plural:	6
Infinitive:	Inf		
Gerund (present participle):	Ger		
Participle (past participle):	Pa		
Imperative:	Imp		

2. Regular Verbs

In this section I shall examine the REGULAR VERBS starting from the traditional classification of Catalan verbs and modifying it later.[1] The basic hypothesis concerning the structure of the verbal system will be presented here and developed later in the analysis of irregular morphology.

The verbal system of Catalan has been traditionally divided into three conjugations, I, II, III. (Fabra (1968), 41). Here are the paradigms of three corresponding verbs, *mirar* 'to look', *batre* 'to beat', and *bullir* 'to boil':

(1)	PI	II	PS	IS	F	C	Inf, Ger, Pa, 2, 5, 6 Imp
	mír u	mir ábə	mír i	mir és	mir əré	mir əríə	mir ár
	mír əs	mir ábəs	mír is	mir ésis	mir ərás	mir əríəs	mir ánt
	mír ə	mir ábə	mír i	mir és	mir ərá	mir əríə	mir ád

(1 cont.)

PI	II	PS	IS	F	C	Inf, Ge / Pa, 2, / 6 Imp
mir ɛ́m	mir ábəm	mir ɛ́m	mir ésim	mir ərɛ́m	mir əríəm	mír ə...
mir ɛ́w	mir ábəw	mir ɛ́w	mir ésiw	mir ərɛ́w	mir əríəw	mir ɛ́w...
mír ən	mir ábən	mír in	mir ésin	mir ərán	mir əríən	mír in...
bát u	bət íə	bát i	bət és	bat ré	bət ríə	bát rə...
bát s	bət íəs	bát is	bət ésis	bət rás	bət ríəs	bət én...
bát	bət íə	bát i	bət és	bət rá	bət ríə	bət úd...
bət ɛ́m	bət íəm	bət ɛ́m	bət ésim	bət rɛ́m	bət ríəm	bát
bət ɛ́w	bət íəw	bət ɛ́w	bət ésiw	bət rɛ́w	bət ríəw	bət ɛ́w...
bát ən	bət íən	bát in	bət ésin	bət rán	bət ríən	bát in...
búλ u	buλ íə	búλ i	buλ ís	buλ irɛ́	buλ iríə	buλ ír...
búλ s	buλ íəs	búλ is	buλ ísis	buλ irás	buλ iríəs	buλ ín...
búλ	buλ íə	búλ i	buλ ís	buλ irá	buλ iríə	buλ íd...
buλ ím	buλ íəm	buλ ím	buλ ísim	buλ irɛ́m	buλ iríəm	búλ
buλ íw	buλ íəw	buλ íw	buλ ísiw	buλ irɛ́w	buλ iríəw	buλ íw...
búλ ən	buλ íən	búλ in	buλ ísin	buλ irán	buλ iríən	búλ in...

The main characteristic of the three paradigms in (1) is that the root doesn't change, except for stress or rules already motivated. This is the case of *batre* whose root vowel a is turned into ə when unstressed by the rule of Vowel Reduction (Chapter 1). The problem of regular verb morphology is thus to account for the regularities of the verbal endings and the alternations of stress.

Except for 2 and 6Imp, there is an exact correlation between person and ending, namely persons 2, 4, 5, 6 end always in s (or z),[2] m, w, n, respectively, and 1 and 3 show presumably no person marker.

The question becomes more complex when we try to find the correspondances between tense and ending. To facilitate the examination of tense markers, let's consider the following chart, which corresponds to (1), once the root and the person markers are removed, as well as epenthetic ə in Inf [bátrə] (cf. rule (11)).

(2)

	PI	II	PS	IS	F	C	Inf, PP, Pa, Imp2, 5, 6
I	u	ábə	i	és	əré	əríə	ár
	ə	ábə	i	ési	ərá	əríə	ánt
	ə	ábə	i	és	ərá	əríə	ád
	ɛ	ábə	ɛ	ési	əré	əríə	ə
	ɛ	ábə	ɛ	ési	əré	əríə	ɛ
	ə	ábə	i	ési	ərá	əríə	i
II	u	íə	i	és	əré	əríə	r
	-	íə	i	ési	ərá	əríə	ént
	-	íə	i	és	ərá	əríə	úd
	ɛ	íə	ɛ	ési	əré	əríə	-
	ɛ	íə	ɛ	ési	əré	əríə	ɛ
	ə	íə	i	ési	ərá	əríə	i
III	u	íə	i	ís	iré	iríə	ír
	-	íə	i	ísi	irá	iríə	ínt
	-	íə	i	ís	irá	iríə	íd
	í	íə	í	ísi	iré	iríə	-
	í	íə	í	ísi	iré	iríə	í
	ə	íə	i	ísi	irá	iríə	i

Is it possible to single out any further systematic generalization in (2)? All three morphological elements, tense, person and conjugation seem to intervene in the determination of the ending. But upon closer examination, an asymmetry appears in (2). Consider separately the first vowel of the ending and the rest of the ending. The second part of the ending is largely invariable across conjugations, the exception being the imperfective indicative of I. As for the first vowel of the ending, the stress distinguishes two cases. In unstressed endings (separated by a line in (2) from stressed endings), the vowel is, like the second part of the ending, invariable across conjugations, the exceptions being 1, 2PI and Imp of conjugation I, and Inf of II. But when the vowel is in a stressed ending, it does vary across conjugations: in no case does a form show the same vowel in all three conjugations. This observation suggests that these vowels be treated differently from the rest of the ending. In particular, I shall classify the constituents of the whole ending in the following form, the THEMATIC VOWEL, as its varying across conjugations suggests, is a marker of the CONJUGATION, and can vary also according to person and tense; it appears only in stressed endings. The TENSE MARKERS (i.e. the unstressed single vowels, and what follows the thematic vowel in (2)) vary according to tense, and exceptionally according to conjugation and person. Finally, the PERSON MARKERS which are invariable Ø for 1 and 3, and z, m, w, n for 2, 4, 5, 6 respectively. This segmentation of a verb form into root, thematic vowel or CONJUGATION marker, TENSE marker, and PERSON marker seems to me rather plausible, given the facts of regular verbs. Of course, Catalan being an inflectional language, each of these morphemes will be MAINLY determined by its morphological correlate (root, conjugation, tense and person), but also SECONDARILY by other morphological properties. Consider incidentally what the two other extreme alternatives would be. One could group together all identical endings and state for each one that a verb takes that ending in the corresponding forms, e.g. it takes és in 1IS conjugations I and II, and 3IS conjugations I and II. This is the method more or less followed by traditional grammars, quite correctly, I think, given their objectives. On the other hand, one could try to regularize the markers more, so that they are less conditioned by other than their morphological correlate; a set of phonological rules would then derive the surface forms. The first alternative should be rejected from the beginning, since it refuses to capture any of the existing generalizations. Let's look a little bit more into the second alternative. We might, for example, claim that the II marker is bə, the PS marker i and the IS marker si (or perhaps even generalize the SUBJUNCTIVE marker as i as opposed to INDICATIVE Ø). We then would have to posit rules deleting b in conjugations I and II after the theme vowel, deleting i after the theme vowel (to get 4PS and 5PS), and deleting i word finally (to get 1IS and 3IS). Along the same lines, one could propose that there is a specific thematic vowel for each conjugation, and that some rules derive the surface thematic vowels in the appropriate cases. The crucial point is that the force of such an analysis rests entirely on the independent motivation of such rules. If they are specific of verb forms morphologica

characterized, then it is exactly equivalent to stating that a given marker appears in some morphologically characterized set of verb forms. Notice furthermore that in this analysis the morpheme is given an underlying form whose choice is arbitrary. That is, there is no reason to prefer having, e.g., underlying II marker bə and delete b, to having underlying ə and insert b in the appropriate places. This indeterminacy of choice of underlying representation, to which I shall return later, indicates that our former proposal is preferable.

The analysis proposed will be strengthened with the discussion in later sections, but I shall present here two cases dealing with stress and nominal derivational morphology that also support it.

Note that there are still two unexplained facts in the paradigms of regular verbs: the correlation between the appearance of the thematic vowel and the stressed character of the ending, and the distribution of stress itself. In Chapter 1 it was shown that stress, rather than being assigned by rule was present in underlying representations. According to that view, the morphemes proposed to mark conjugation, tense and person should also share that property. Thus we can propose the thematic vowel to be stressed underlyingly. The only instances of unstressed thematic vowel are the future and conditional (see (1) or (2)). But precisely future and conditional are stressed on the tense marker, and that is why appearance of thematic vowel was correlated to stress in the ending (i.e., stress on the thematic vowel itself or on the tense marker). We already know that within a word, a rule deletes all but the rightmost stress (rule (24), Ch. 1), so the thematic vowel can be set up stressed underlyingly and it will be destressed by an independently motivated rule in the appropriate cases. The distribution of stress in regular verbs in (1) follows from the assumptions discussed and justified in Chapter 1, namely that morphemes are underlyingly stressed or unstressed and that surface stress is predicted by a Destressing rule. The verb root will always be stressed, and more specifically stressed on the last syllable,[3] the thematic vowel will also bear stress, and the rest of the markers will be unstressed, except for future and conditional which will be stressed. After Destressing has applied, stress will show up on the future and conditional markers in these tenses, on the thematic vowel in the other forms where this appears, and otherwise on the stem, e.g.:

(3)   búλ+í+rá+s   mír+é+si+m   mír+ə+s

    DESTR. u i   i   -

            buλirás   mirésim   míres

The existence of a thematic vowel, in particular of a stressed thematic vowel, is supported by deverbal derivatives, where in fact a thematic vowel also appears. Consider the productive suffixes dó(r),

which forms nouns or adjectives with the meaning 'the one that X',
'the property of Xing' (where X is the verb); mén(t), which forms nouns
with the meaning 'the action or state of Xing'; and plə, which forms
adjectives parallel to English adjectives in -able.[4] The verbs that
correspond to them are in 3PI; recall that that form consists of root
+ə in I conjugation and the bare root in conjugations II and III.

(4) | Conj. I | Conj. II | Conj. III |
|---|---|---|
| pur̄tədó | pər̄dədó | kuʎidó |
| pɔ́r̄tə 'he bears' | pɛ́r̄t 'he loses' | kúʎ 'he picks up' |
| trənsfur̄mədó | kunəšedó | muɲidó |
| trənsfɔ́r̄mə 'he trans-
forms | kunɛ́š 'he knows' | múɲ 'he milks' |
| pəgəmén | r̄əbəmén | r̄ətruɲimén |
| págə 'he pays' | r̄ɛ́p 'he receives' | r̄ətrúɲ 'it booms' |
| miʎurəmén | bənsimén | səntimén |
| miʎɔ́rə 'he improves' | bɛ́ns 'he wins' | sén(t) 'he feels' |
| kəntáplə | kunsəbíplə | dəskuzíplə |
| kántə 'he sings' | kunsép 'he conceives' | dəskús 'he unstick |
| kuɱfur̄táplə | təmíplə | buʎíplə |
| kuɱfɔ́r̄tə 'he comforts' | tɛ́m 'he fears' | búʎ 'he boils' |

The underlined vowels á, ə, í, i clearly show up because the nouns
or adjectives are deverbal. This can be seen comparing (4) with the
cases where there exist derivatives which are not deverbal: [miʎɔ́rə]
(ə the feminine marker) 'improvement', [kántik] 'canticle, song', [təmór̄]
'fear', [búʎ] 'boil'. Furthermore this vowel corresponds to the thematic
vowel in verbal forms: ə, ə for conj. I, ə, i for conj. II, and i for
conj. III. Most suffixes are stressed, so the thematic vowel shows up
unstressed but in plə (underlyingly bl, see note 4) the last stress of the
word is on the thematic vowel, and it gets the stress as expected.

In (4) a particularity of conjugation II already observable in (2)
is repeated; namely that the thematic vowels of that conjugation are
the same as those of either conj. I or conj. II, depending on the deri-
vational suffix. The same thing happens in the verbal paradigm ((1) or
(2)): in some forms the thematic vowel of conj. I and II coincide, in
some forms they coincide in II and III. I would like to suggest that the
explanation for this particular distribution is that so called "regular
II conj. verbs" (referred to as groups R-1 and R-2 later) are in fact
irregular, their irregularity consisting of having a mixed conjugation
marker (or thematic vowel), sometimes belonging to conj. I, sometimes
to III, sometimes a thematic vowel of their own (é and ú in Ger and Pa,
and lack of thematic vowel in the Inf). There is a reason, of course,

why a verb like *bátre* has been included in a II regular conjugation. The particular type of "mixing" of thematic vowels that it shows is the most common among verbs that don't belong to conj. I or to conj. III. Other verbs, and this favors this analysis, present different kinds of "mixing", that is, they have the thematic vowel of conj. III or conj. I in other tenses or persons than *bátre* (see sections 5, 6). In addition, all verbs formed by derivation from other words belong to conj. I or to conj. III (Fabra (1968), 138-141).

3. Class IIIa and Other Anomalous Verb Forms

The verbs formed by derivation belonging to conj. III that were just mentioned, as well as other conj. III verbs, differ slightly from the paradigm given for conj. III in (1). Thus besides *bátre* we have *unir* 'to unite' with the following paradigm:

(5)	PI	II	PS	IS	F	C	Inf, Ger, Pa, 2, 5 6Imp
	un ɛ̌šu	un ʃə	un ɛ̌ši	un ʃs	un irɛ̌	un irʃə	un ʃr
	un ɛ̌šəs	un ʃəs	un ɛ̌šis	un ʃsis	un irás	un irʃəs	un ʃnt
	un ɛ̌š	un ʃə	un ɛ̌ši	un ʃs	un irá	un irʃə	un ʃd
	un ʃm	un ʃəm	un ʃm	un ʃsim	un irɛ̌m	un irʃəm	un ɛ̌š
	un ʃw	un ʃəw	un ʃw	un ʃsiw	un irɛ̌w	un irʃəw	un ʃw
	un ɛ̌šən	un ʃən	un ɛ̌šin	un ʃsin	un irán	un irʃən	un ɛ̌šint

Unir differs from *bullir* in that it presents an increment ɛ̌š in certain forms. That ɛ̌š doesn't belong to the root is clear from the fact that the vast number of verbs that follow the paradigm of *unir* have different roots but the same increment ɛ̌š in the same forms. Now compare the forms in which *bullir* and *unir* differ:

(6)				
PI:	1	bṹʎu	un ɛ̌š u	
	2	bṹʎs	un ɛ̌š əs	
	3	bṹʎ	un ɛ̌š	
	6	bṹʎ ən	un ɛ̌š ən	
PS:	1	bṹʎ i	un ɛ̌š i	
	2	bṹʎ is	un ɛ̌š is	
	3	bṹʎ i	un ɛ̌š i	
	6	bṹʎ in	un ɛ̌š in	
Imp:	2	bṹʎ	un ɛ̌š	
	6	bṹʎ int	un ɛ̌š int	

Notice first of all that the forms differ just in the increment
έš, and in stress. The only exception, 2PI, where we get [unéšəs]
instead of *[unéšs] is the result of a ə insertion rule that will be
discussed directly. The increment éš is always placed between the
root and the tense and person markers, that is in the same place as the
thematic vowel. Given these facts, and the fact that éš is character-
istic of a class of verbs (i.e. a conjugation) we might assign to éš the
same status as the thematic vowel, and call it THEMATIC INCREMENT.

Recall that in (2) a distinction in the class of initial vowels of
the ending was proposed to define the THEMATIC VOWEL. Interestingly
enough, this same distinction appears when we try to determine the
class of forms where éš appears: the forms in (6) are exactly the forms
that lack a thematic vowel. This fact, i.e. éš appearing whenever the
thematic vowel í doesn't appear, gives further support to the distinc-
tion between forms with and without thematic vowel put forward before.

As for the stress, considering éš as thematic element along with
the thematic vowel, exactly predicts the placement of stress in (6).
éš, as the thematic vowel, will be stressed underlyingly, and the rule
of Destressing will eliminate the root stress in all cases.

There are also some other verbs that seem not to conform to the
paradigms in (1). As we shall see, their diverging from (1) is due to
the effect of general phonological rules.

The desinence of 2 and 3PI is different for conj. I and conjs. II,
III; conj. I takes əs, ə, and conjs II, III take s, Ø (cf. (2)). But
there are some verbs that, although they belong to II or III, as witnessed
by their Ger and II, seem to take the endings of conj. I in 2, 3PI:

(7) a.		II	Ger	2PI	3PI
cosir	'to sew'	kúz fə	kúz fnt	kúz əs	
tossir	'to cough'	tus fə	tus fnt	tús əs	
fugir	'to flee'	fúž fə	fuž fnt	fúž əs	
tòrcer	'to bend'	turs fə	turs ént	tórs əs	
vèncer	'to win'	bəns fə	bəns ént	béns əs	
crèixer	'to grow'	krəš fə	krəš ént	kréš əs	
conèixer	'to know'	kunəš fə	kunəš ént	kunéš əs	

(7 cont.)

b.

		II	Ger	2Pl	3Pl
obrír	'to open'	ubr ía	ubr ínt	óbr əs	óbrə
omplír	'to fill'	umpl ía	umpl ínt	ómpl əs	ómplə
córrer	'to run'	kuf̄ ía	kuf̄ ént	kóf̄ əs	kóf̄ə

(7a), rather than being verbs that take irregularly the tense markers of another conjugation, are regular verbs subject to a rule that inserts ə between sibilants. This rule seems to be operative also in other cases. Consider the plurals of "invariable" feminine adjectives, i.e. adjectives which take no feminine ending ə:

(8)

Fem. Sg.		Fem. Pl.
fásil	'easy'	fásils
bulgáf̄	'vulgar'	bulgáf̄s
sublím	'sublime'	sublíms
fəlís	'happy'	fəlísəs
bəlós	'quick'	bəlósəs
fugás	'fleeting'	fugásəs

The examples in (7b) are similar. In Chapter (2) it was shown that ə was inserted after geminates before C or word finally. In fact this rule should be extended to cover other cases, in particular sequences of stop + liquid:

(9)

		Diminutive	Plural
šísklə	'scream'	šisklét	šískləs
áŋglə	'angle'	əŋglét	áŋgləs
ábrə	'tree'	əbrét	ábrəs
súkrə	'sugar'	sukrét	súkrəs
bídrə	'glass'	bidrét	bídrəs
tríplə	'triple'	triplét	trípləs
teátrə	'theater'	teətrét	teátrəs

The diminutive and other suffixes, can be added to the consonant ending roots šískl, ángl, etc. and an epenthetic ə inserted word finally and before C.

Both rules of ə insertion should be examined in more detail to accomodate other cases and exclude some also, but I shall not try to deal with them and formulate the rules as (10) and (11) for future reference.

(10) $\emptyset \rightarrow \partial \ / \ \begin{bmatrix} +\text{cont} \\ +\text{cor} \end{bmatrix} + \underline{\hspace{1cm}} \begin{bmatrix} +\text{cont} \\ +\text{cor} \end{bmatrix}$

(11) $\emptyset \rightarrow \partial \ / \ [-\text{cont}] \ [+\text{son}] \ \underline{\hspace{1cm}} \begin{Bmatrix} \#\# \\ C \end{Bmatrix}$

Notice that (11) will take care of the last examples in (7b), [kórəs], [kórə] since we can represent its phonetic continuant r̄ by the sequence of two (noncontinuant) r's /rr/, as shown in Ch. 2. Similarly, the exception encountered when we examined the verbs taking the increment éš, namely 2PI [unéšəs] instead of *[unéšs] (cf. (6) and following discussion), will be accounted for by (10).

Other apparently anomalous verb forms are found in verbs of conjugation II that, having other irregularities, will be dealt with in the next section. One of their characteristics is to lack the thematic vowel in the Infinitive, Future and Conditional. When the root of such a verb ends in l or n one would expect Infinitive, Future, and Conditional in lr, nr; lré, etc., nré, etc.; lríə, etc., nríə, etc., respectively. Instead we get ldr, ndr, ldré, ndré, ldríə, ndríə. The d could not belong to a particular tense marker for this class of verbs, since it doesn't show up but in this case, namely when the phonological environment lr or nr is found. We can therefore suppose the d inserted by rule. But morpheme internally lr, nr, and ldr, ndr contrast:

(12) a.   b.

unr̄át	'honest'	indrét	'place'
ənr̄əuná	'to speak'	séndrə	'ash'
ənr̄ík	'Henry'	téndrə	'tender'
kunr̄éw	'cultivated land'	əndréw	'Andrew'
fulr̄á	'to line'	bəldrík	'sword belt'
tulr̄á	(family name)	buldró	'bunch of higher plants in a field'

Across morphemes we also find both solutions:

(13) a.   b.

    són##r̄óks   'they are rocks'   bən+dré 'I shall sell'

    ból##r̄óks   'he wants rocks'   bul+dríə 'he would like'

    ən#r̄éntən   'they wash some   fón+drə 'to melt'
                  of them'

    əl#r̄éntən   'they wash him' ·pun+drá 'he will lay'

    ən#r̄érə   'backwards'   (cf. 3PI: bén, ból, fón, pón)

    cf. dər̄erə 'behind'

    in#r̄əbés   'upside down'

    cf. r̄əbés 'reverse'

    ən#r̄əžulá   'to tile'

    cf. r̄əžólə 'tile'

The rule should therefore be formulated so as not to apply across any number of #'s, that is,

(14) $\emptyset \rightarrow d \ / \ \left\{ \begin{matrix} n \\ l \end{matrix} \right\} \underline{} r$

so that it applies to (13b) but not to (13a), nor to (12a) (in (12b) the d is present underlyingly). In (12a) nr is within a morpheme and the SCC will block its application. Here are the derivations of three illustrative cases:

(15)   [[unr]+át]   [ən#[rérə]]   [[bén]+rə]

    D-INS   blocked by SCC   ---   d
    r → r̄   r̄   r̄   -
                unr̄át   ənr̄érə   béndrə

For morpheme-internal lr or nr D-insertion will not be able to apply because it cannot apply properly on any cycle: all information used by the rule is within the 0th cycle and no crucial information is introduced on later cycles. The r will then become a trill since it follows n or l. r will also become r̄ in words like [ən#[rérə]] but D-insertion will be inapplicable. On the other hand, D-insertion will apply on the first cycle in [₁[₀bén]₀+rə]₁ and similar cases, and the r no longer following n or l, it will remain flapped. Recall that the SCC will not

apply to r → r̄ rules, because they are postcyclic, since they are not neutralizing (see the Introduction).

To sum up, I have presented the paradigms of three conjugations (*mirar* I, *bullir* IIIb, *unir* IIIa; *batre* was classified as irregular) and considered their forms as constituted of four morphemes. The root and the thematic vowel, or thematic increment for IIIa, form the stem. The desinence is formed by tense marker and the person marker. The set of morphemes of the flexional ending of regular verbs is given below.

(16) Thematic vowel or increment

	I	IIIb	IIIa
1, 2, 3, 6PI; 1, 2, 3, 6PS; 2, 6Imp; F; C	∅	∅	é̆š
II, Inf, Ger, Pa	á	í	í
4, 5PI; 4, 5PS; 5Imp	ɛ́	í	í
IS	é	í	í

Tense

	PI	II	PS	IS	F	C	Imp	Inf	Ger
1	u	I bə 1,2,3,6 i		1,3 s	1 ré	ríə	I2 ə	r	nt
6	ə	III ə 4,5 ∅	2,4,5, si	4,5 ré		III2,5 ∅			
			6						
I2,3	ə			2,3,6 rá		6 i			
others	∅								

Person

1. ∅

2. s; Imp: ∅

3. ∅

4. m

5. w

6. n; Imp: nt

4. "Regular" conj. II Verbs and Irregular Participles

The so-called second conjugation is defined by the mixed character of its thematic vowels (sometimes those of conjs. I and III, sometimes different, sometimes lacking in forms where I and III have it), and it is characterized by being by and large irregular. This irregularity can be attributed--as I shall try to show--for each verb or group of verbs to the distribution of the thematic vowel and polymorphism of the root, which is however subject to subregularities. Tense and person marker are mostly unaffected by irregularity, and discrepancies from the regular markers are reduced to the otherwise quite irregular participle.

The group of verbs to be analyzed in this section is characterized by having fixed root and thematic vowel (except for the participle), the thematic vowel and the tense markers having the following distribution, as already indicated before:

(17) Thematic Vowel: R-1, R-2   Tense Markers

1,2,3,6PI; 2,6Imp 1,2,3,6PS	$\emptyset$ = I = III	as in (16)
II	í = III	follows conj. III
4,5PI; 4,5PS; 5Imp	é = I	
IS	é = I	
Ger	é	
Inf, F, C	$\emptyset$	
Pa	ú	

Group R-1. It's formed by *batre*, whose paradigm was already presented and discussed together with I and II conjugation verbs in the preceding section.

Group R-2. It comprises the verbs mentioned in Chapter 2, section 9, where it was argued that their infinitive marker is not r, but ə. Apart from the infinitive, the only forms where they differ from group R-1 is future and conditional. Compare the following forms with the corresponding form *batre* (1) (rr yields a surface phonetic ř):

(18) *córrer* 'to run'   *vèncer* 'to win'

F	C	F	C
kurr əré	kurr əríə	bəns əré	bəns əríə
kurr ərás	kurr əríəs	bəns ərás	bəns əríəs

(Cont., 18)

F	C		F	C
kurr ərá	kurr ərʃə		etc.	etc.
kurr ərɛ́m	kurr ərʃəm		*plǎnyer* 'to pity'	
kurr ərɛ́w	kurr ərʃəw		pləɲ ərɛ́	pləɲ ərʃə
kurr ərán	kurr ərʃən		pləɲ ərás	pləɲ ərʃəs

The expected forms would be [kurrré], [bənsré], [plənré], etc. The inserted ə in *córrer* is already taken care of by (11), and in the other examples by extending (11) to the appropriate environments.

No verb of conj. I has an irregular participle, but conjs. IIIa and IIIb, as well as the groups of conj. II examined so far, have some verbs whose participles have endings other than the regular íd for III and úd for II. *Admetre* 'to admit' (and other verbs in *-metre*, = Eng. *-mit*) has a root alternant ədmɛ́z, no thematic vowel, and Ø participle marker, and similarly *imprimir* 'to print' with the root alternant imprɛ́z. *Mereixer* 'to merit' and *créixer* 'to grow' have the roots mərɛ́sk and krɛ́sk with the normal thematic vowel and tense marker ú and d, and the same holds for *córrer* 'to run' with the root kórrg which undergoes ə insertion (cf. with the verbs that add g, next section). The rest of the examples have no thematic vowel and the marker t: *estrènyer* 'to narrow, constrain' has əstrɛ́, *morir* 'to die' and *oferir* 'to offer' have their regular roots mór and ufɛ́r, and *sofrir* 'to suffer', *obrir* 'to open', *cobrir* 'to cover' and *establir* 'to establish' have, respectively, sufɛ́r, obɛ́r, kubɛ́r, and əstəblɛ́r. Here are the participle forms with the corresponding 4PI forms that show their regular root (except for the reduced root vowel) and the conjugation they belong to (ending ím for III and ending ɛ́m for II):

(19)

4PI	Participle
ədmət ɛ́m	ədmɛ́z
imprim ím	imprɛ́z
mərəš ɛ́m	mərəsk úd
krəš ɛ́m	krəsk úd
kur̄ ɛ́m	kur̄əg úd
əstrəɲ ɛ́m	əstrɛ́ t
mur ím	mór t
ufər ím	ufɛ́r t

(Cont. 19)

4PI	Participle
sufr ím	sufér t
ubr ím	ubér t
kubr ím	kubér t
əstəpl ím	əstəplér t

5. Verbs with Root Final G

In this class I shall include verbs that, in addition to some minor irregularities, show a root final velar g in some forms. I shall present first the paradigm of one of such verbs (excluding the participle), and later the forms of other verbs that differ from those in the example paradigm. Participles, which show most irregularities, will be treated at the end of the section.

Group G-1. *Fondre* 'to melt' presents the following forms:

(20) PI	II	PS	IS	F	C	Inf,Ger, 2,5,6Imp
fóŋ	fun íə	fóŋg i	fuŋg és	fun dré	fun dríə	fón drə
fóŋ s	fun íəs	fóŋg is	fuŋg ésis	fun drás	fun dríəs	fun ént
fón	fun íə	fóŋg i	fuŋg és	fun drá	fun dríə	
fun ɛ́m	fun íəm	fuŋg ɛ́m	fuŋg ésim	fun drɛ́m	fun dríəm	fón
fun ɛ́w	fun íəw	fuŋg ɛ́w	fuŋg ésiw	fun drɛ́w	fun dríəw	fun ɛ́w
fón ən	fun íən	fóŋg in	fuŋg ésin	fun drán	fun dríən	fóŋg int

The alternations in the thematic vowel are the same as for *bátre*, mentioned before (section 4), some forms having the thematic vowel of conj. I, others that of conj. III:

(21) Thematic vowel: G-1, G-2 (also W-4, and one variant of W-3)

1,2,3,6PI; 1,2,3,6PS; 2,6Imp	$\emptyset$ = I = III
II	í = III
4,5PI; 4,5PS; 5Imp	ɛ́ = I

(Cont. 21)

IS	é = I
Ger	é
Inf, F, C	∅

The alternations between o and u in the root are due to the Vowel Reduction rule studied in Chapter 1, which operates on unstressed vowels. The d in F, C, and Inf is the result of the D-Insertion rule examined before, and the ə in the Inf [fóndrə] is inserted by rule (11), after D-Insertion has applied. As for the tense endings, they are already taken care of by (16) and (17), but the tense marker for 1PI is different:

(22) <u>Tense marker : G-verbs</u>

   1PI   ∅

The only forms still unaccounted for are 1PI, and PS and IS. 1PI is [fón] and in the other cases a g appears before the ending (1PS [fóŋgi], etc.) The alternations between n and ŋ throughout the paradigm can be handled with the rule of Assimilation of Nasals presented in Chapter 2, and by the same rule plus Cluster Simplification; [fón] from /fóng/ → fóŋg → [fón].

The question that arises is how the alternation fón~fóng should be handled. The g clearly doesn't belong to tense or person endings, since it is separated from them by the thematic vowel in 4,5PS and in IS. It could be regarded as a thematic increment similar to éš of class IIIa (section 2), but here the clear-cut correlation between appearance of thematic increment and lack of thematic vowel (see (6)) is missing. There are three other possible alternatives to account for this alternation: a) the root of *fondre* is *fóng* and g is deleted in the appropriate environments; b) the root is *fón* and g is inserted appropriately; c) there are two underlying roots *fong* and *fon*. I shall return to the problem of determining the underlying form of the root in such cases, when more irregular verbs have been examined. Notice however that the determination of the two environments is not statable in phonological terms; besides the great disparity of all the forms that it covers, 4PI [funém] and 4PS [fúŋgém] are phonologically identical but for g, yet they would have to be differentiated. The same is true of 5PI and 5Imp [funéw] and 5PS [fuŋgéw].[5]

<u>Group G-2</u>. The verb *prendre* 'to take' is similar to *fondre*. It has the parallel forms préŋg~prén, but shows another change in the root in F, C, and Inf. Here are these forms together with some examples of the rest of the forms, that don't exhibit the change:

(23)   F: pən dré   C: pən dríə   Inf: péndrə

     1PI   préŋ   pən drás   pən dríəs

     3PI   prén   pən drá   pən dríə

     4II   prən íə   pən drέm   pən drìəm

     1PS   préŋg i   pən drέw   pən dríəw

     6IS   prəŋg ésiw, etc.   pən drán   pən dríən

It is clear that the lack of r in the forms in pén-, as opposed to préŋg
or prén, is determined (if by any phonological environment at all) by
the following d, or r, or both. But one should be cautious before
attributing the loss[6] of r to a phonological rule: if indeed there is
such a phonological rule, one should expect to find its effects in other
places as well. A rule of that sort might have been active in the past,
and actually in varieties of the dialect discussed here, since one
finds forms [pugrámə] 'program', [pubblémə] 'problem' instead of
[prugrámə], [prublémə]. But most speakers, myself included, get words
involving two sequences of C+liquid, like the two last examples and the
following:

(24)   tríplə   'triple'   pre#ndrés   'pre-arrangement'

       prugrés   'progress'   tri+ándrə   'triandric'

       frustrá   'to frustrate'   prə+skríw   'he prescribes'

       frətrisídə   'fratricide'   sobrə#prén   'it supervenes'

It is difficult to decide whether the rule is still operative, restricted
to verbs (the only examples are *prendre* and its compounds), or *prendre*
has the root variants préŋg, prén and pén, the latter for Inf., F. and C.
Since there is no other verb of the form CrV$\{^n_l\}$ of the II conj., I don't
find a way to choose one of the alternatives and shall leave the question
open.

    Group G-3. The verbs *soler* and *valer*, 'to use to' and 'to cost ,
to be worth', respectively, have Inf and Ger differing from the paradigm
of *fondre* (20):

(25)   1PI   sólk   bálk   Inf   sul ér   bəlg ér

       2PS   sólg i   bálg i   Ger   sul ént   bəlg ént

       4PI   sul έm   bəl έm

    Notice incidentally that g is not deleted in 1PI as in fóng →
foŋg → fóŋ, but devoiced: sólk, bálk, as Cluster Simplification (rule

(29) in Chapter 2) and the general process of final obstruent devoicing predict. For the Inf and Ger we would expect [sóldrə], [báldrə], and [sulént], [bəlént].

As we noticed before, conj. II verbs are characterized for their irregularity in the choice of the thematic vowel: in some tenses they have conj. I thematic vowels, in others conj. II, and in others a different or no thematic vowel. *Soler* and *valer* differ from the normal distribution of thematic vowels of (21) by having ɛ́ in Inf and Ger. In addition, *valer* extends the g of 1PI, PS and IS to these two tenses, too. The distribution of the thematic vowel is thus the following:

(26) Thematic vowel : *soler, valer*

1,2,3,6PI; 1,2,3,6PS; 2,6Imp $\emptyset$ = I = III

II   í = III

4,5PI; 4,5PS; 5Imp   ɛ́ = I

IS   é = I

Inf, Ger   ɛ́

F, C $\emptyset$

Group G-4. A final group of verbs belonging to this class are characterized by the alternation of g with a root final š. Another property of this group is the fact that for some tenses there is free variation between g and š. The group divides itself in two sets, a) compounds of the root pərɛ́š (*aparèixer* 'to appear', *comparèixer* 'to present oneself, to appear', etc.); and b) *conèixer* 'to know' and its compounds (*reconèixer* 'to recognize', *desconèixer* 'not to know', etc.). Here are the forms that present some anomaly, for *aparèixer* and *conèixer* (other forms are regularly formed from the root ending in š, Pa apart).

(27) 1PI əpərɛ́š u   kunɛ́š u, kunɛ́k

Inf əpərɛ́š ə   kunɛ́š ə

F əpərəš ərɛ́   kunəš ərɛ́

əpərəš ərás   kunəš ərás

etc.   etc.

C əpərəš əríə   kunəš əríə

əpərəš əríəs   kunəš əríəs

etc.   etc.

(Cont. 27)

PS	əpərɛ́š i, əpərɛ́g i	kunɛ́š i, kunɛ́g i
	əpərɛ́š is, əpərɛ́g is	kunɛ́š is, kunɛ́g is
	etc.	etc.
IS	əpərəg ɛ́s, əpərəš ɛ́s	kunəš ɛ́s, kunəg ɛ́s
	əpərəg ɛ́sis, əpərəš ɛ́sis	kunəš ɛ́sis, kunəg ɛ́sis
	etc.	etc.

Inf, F, and C are perfectly "regular" in that they lack as most conj. II verbs, the thematic vowel in these tenses. Future and Conditional receive a vowel ə by rule (11); the Infinitives [əpərɛ́šə], [kunɛ́šə] have the special marker ə, as other verbs discussed before. Although in some cases one of the forms in free variation might be slightly favored, both š and g roots appear in PS and IS, as well as in 1PI for *conèixer*. In the participle, which will be dealt with at the end of the section, the form with g is the only one.

Let's examine now the participles of the verbs of conj. II considered so far. In (28) a form containing the root of the verb, for each root, is present along with the participle, the proposed alternant roots underlined:

(28)

3PI	3PS	Pa	Thematic Vow. of Pa	Pa Marker
b<u>át</u>		b<u>at</u>úd	ú	d
um<u>ɛ́t</u>		um<u>ɛ́</u>z	∅	∅
əstr<u>ɛ́ɲ</u>		əstr<u>ɛ́t</u>	∅	(t)
ət<u>ɛ́ɲ</u>		ət<u>ɛ́</u>z	∅	∅
k<u>órə</u>		ku<u>rəg</u>úd	ú	d
n<u>ɛ́š</u>		nə<u>sk</u>úd	ú	d
f<u>ón</u>	f<u>óŋg</u>i	f<u>ó</u>z	∅	∅
ənt<u>ɛ́n</u>	ənt<u>ɛ́ŋg</u>i	ənt<u>ɛ́</u>z	∅	∅
b<u>ɛ́n</u>	b<u>ɛ́ŋg</u>i	bə<u>ŋg</u>úd	ú	d
p<u>ón</u>	p<u>óŋg</u>i	p<u>ó</u>st	∅	t

(Cont. 28)

r̄əzól	rəzólgi	r̄əzólt	Ø	t
prέn	prέŋgi	prέz	Ø	Ø
sól	sólgi	sulgúd	ú	d
bál	bálgi	bálgúd	ú	d
əpərέš	əpərέgi	əpərέgúd əpərəskúd	ú	d
kunέš	kunέgi	kunəgúd	ú	d

Some of the participles have been already discussed, section 4.

We might distinguish three cases within the participle forms: a) those that, most regularly, take the thematic vowel ú and the participle marker d, b) those that don't have thematic vowel and show a participle marker t, which we shall find later in other verbs, and c) those that don't show any specific thematic or participle morpheme at all and form the participle on a suppletive root. Under a) we find the group that forms the participle most regularly on the root, represented in (28) by [batúd], those that form it from their g final root ([bəngúd], [sulgúd], [bəlgúd], [əpərəgúd], [kunəgúd]; also [kur̄əgúd] whose only g root is in the participle and that has undergone ə insertion), and a group of verbs represented by [nəskúd] and [əpərəskúd] that form it from a root ending in sk that appears only in the participle. Under b) there is [r̄əzólt], [póst], and perhaps [əstrέt] if the suppletive root is əstrέ and not əstrέt itself. [póst] could be analyzed as [póz+t], the z being related to the z of some verbs in c), like [umέz], [ətέz], [fóz], [əntέz], [prέz] these z alternate with the root final consonant in other forms (t, n, n) but is followed by no participle marker in these cases, as compared with [póz+t].

6.   Verbs with Root Final W

Putting aside the participle forms, that are specially irregular (like for G-verbs) the class I shall refer to as "root-final W" is characterized by presenting a root ending in Vw in certain forms, and can be subdivided in seven groups. These groups are determined by the alternants of the root in V̌w: V̌b, V̌g, V̌sk, V̌g, V̌yg and έy, and an irregularity in the thematic vowel (thematic vowel of III in forms where I is expected).

Group W-1. Formed by *beure* 'to drink', *moure* 'to move', *deure* 'must', *ploure* 'to rain' and their compounds. They have roots in V̌G in the same forms as in the G class, namely 1PI, PS, IS, and Pa. But in addition to root VW, characteristic of the class, appears in 2, 3,6PI, Inf, F, and C. In the rest of the forms the root is VB; as the paradigm of *beure* reveals:

(29) PI	II	PS	IS	F	C	Inf,Ger, Pa, 2,5, 6Imp
bɛ́k	bəb íə	bɛ́g i	bəg és	bəw ré	bəw ríə	bɛ́w rə
bɛ́w s	bəb íəs	bɛ́g is	bəg ésis	bəw rás	bəw ríəs	bəb ént
bɛ́w	bəb íə	bɛ́g i	bəg és	bəw rá	bəw ríə	bəg úd
bəb ɛ́m	bəb íəm	bəg ɛ́m	bəg ésim	bəw rɛ́m	bəw ríəm	bɛ́w
bəb ɛ́w	bəb íəw	bəg ɛ́w	bəg ésiw	bəw rɛ́w	bəw ríəw	bəb ɛ́w
bɛ́w ən	bəb íən	bɛ́g in	bəg ésin	bəw rán	bəw ríən	bɛ́g int

The thematic vowel distribution and the tense endings are the same as in (21). The rest of the alternations (devoiced g in [bɛ́k], ε→ə if unstressed) are already familiar. The way to account for the alternations in the root-final consonant will be faced in the next section, after all seven groups have been examined.

Group W-2. It is formed by *escriure* 'to write' and its compounds. Except for the participle, that has the root variant əskrí and takes the participle marker t mentioned in (28) and following discussion, the root forms are the same as for group W-1, i.e. əskríw, əskríb, əskríg for the same forms. But for *escriure*, the thematic vowels for forms with əskríb is always í, that is, it takes the conj. III thematic vowel instead of conj. I for these forms. Compare them with those for *beure*:

(30) PI	II	Ger
4 bəb ɛ́m--əskrib ím	bəb íə--əskrib íə	bəb ént--əskrib ínt
5 bəb ɛ́w--əskrib íw	bəb íəs--əskrib íəs	
	bəb íə--əskrib íə	5 Imp
	bəb íəm--əskrib íəm	bəb ɛ́w--əskrib íw
	bəb íəw--əskrib íəw	
	bəb íən--əskrib íən	

The II makes no difference, since these conj. II verbs have normally thematic vowel í already. Other forms show the alternations of group W-1 (e.g. əskrík, əskríw, etc.) but in the subjunctives both stems əskríg (+ thematic vowel Ø, ɛ́, or ə) and əskríbí do appear:

(31) <u>PS</u>   <u>IS</u>

      əskríg i   əskrig és,   əskrib ís

      əskríg is   əskrig ésis,   əskrib ísis

      əskríg i   əskrig és,   əskrib ís

      əskrig ém, əskrib ím   əskrig ésim,   əskrib ísim

      əskrig éw, əskrib íw   əskrig ésiw,   əskrib ísiw

      əskríg in   əskrig ésin,   əskrib ísin

The thematic vowel distribution is thus the following:

(32) <u>Thematic vowel</u>: *escriure* (and *viure*) (W-2, W-3)

    1,2,3,6PI; 1,2,3,6PS; 2,6Imp   ∅ = I = III

    II; 4,5PI; Ger; 5Imp (4,5PS;   í = III
    IS)

    (4,5PS)   é = I

    (IS)   é = I

    Inf, F, C, Pa   ∅   (ú for <u>Pa</u> of *viure*)

Participle takes t: əskrít, and lacks thematic vowel.

Group W-3. *Viure* 'to live' and its compounds are very similar to *escriure*. The distribution of the thematic vowel is the same, and so are the variant forms in the subjunctive. The only difference is in the root final g which is instead sk, and the participle that is formed from the root in sk with regular thematic vowel ú and participle marker d. We thus have, instead of əskríw~əskríb~əskríg, bíw~bíb~bísk:

(33) <u>PI</u>   <u>PS</u>   <u>IS</u>

    bísk   bísk i   bisk és,   bib ís

    bíw s   bísk is   bisk ésis, bib ísis

    bíw   bísk i   bisk és,   bib ís

    bib ím   bisk ém, bibím   bisk ésim, bib ísim

    etc.   bisk éw, bibíw   bisk ésiw, bib ísiw

           bísk in   bisk ésin, bib ísin

Group W-4. *Coure* 'to cook', *plaure* 'to please', *cloure* 'to close' and their compounds present -V̊w~-V̊g root alternations, but no b appears corresponding to group W-1 -V̊b root. Thus, besides the forms [kók̩], [ków̩s], [kóg̩i], etc, we find

(34)

	PI	II	Ger	5 Imp	Pa
4	ku ɛ́m	ku ʃə	ku ént	ku ɛ́w	kúy t
5	ku ɛ́w	ku ʃəs			
		ku ʃə			
		ku ʃəm			
		ku ʃəw			
		ku ʃən			

The participle is formed by adding the participle marker t already mentioned before to the root kúy without thematic vowel. *Coure* when it has derived meaning (e.g. 'to smart'), and *plaure*, make the participle regularly, as Group R-1: [kugúd], [pləgúd]. *Cloure* has [klóz], without thematic vowel or participle marker.

Group W-5. *Caure* 'to fall' and its compounds have the following paradigm:

(35)

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6 Imp
káy k	kɛ́y ə	káyg i	kəyg és	kəw ré	kəw ríə	káw rə
káw s	kɛ́y əs	káyg is	kəyg ésis	kəw rás	kəw ríəs	kəy ént
káw	kɛ́y ə	káyg i	kəyg és	kəw rá	kəw ríə	kəyg úd
kəy ɛ́m	kɛ́y əm	kəyg ɛ́m	kəyg ésim	kəw rɛ́m	kəw ríəm	káw
kəy ɛ́w	kɛ́y əw	kəyg ɛ́w	kəyg ésiw	kəw rɛ́w	kəw ríəw	kəy ɛ́w
káw ən	kɛ́y ən	káyg in	kəyg ésin	kəw rán	kəw ríən	káyg int

Abstracting away from the II, which is characteristic of groups W-5, W-6 and W-7, as we shall see, W-5 is entirely parallel to group W-1, having, instead of V̊w~V̊b~V̊g, V̊w~V̊y~V̊yg, respectively (cf. (29) and (35)).

One might consider the alternative of extending the set of thematic vowels to cover unstressed vowels appearing after the root (see section 2). This proposal might seem attractive to handle the II [kéyə], etc., deriving it from /kɛ+i+ə/, i being the thematic vowel. After stress had been assigned to ɛ, Glide Formation would derive [kéyə]. The analysis consistent with the position taken here would instead have a root kéy and postulate absence of thematic vowel in II for *caure* and similar verbs. Two facts favor, I think, my solution—and therefore the theory that is consistent only with it. First notice that the root in II is idiosyncratic anyway, since it has the vowel é instead of the á of other root-stressed forms; in addition the y of the root posited for II appears also in other forms with and without g: [kayg+i], but also [kəy+ém], [kəy+ént], etc. Secondly, Glide Formation doesn't apply across + in verbs, as [krɛ́+i] 'he creates' (subj.), [ʌú+i] 'it shines' (subj.), [fi+ém] 'we confide', [su+és] 'he sweated' (subj.) show. It could be argued that it doesn't apply in the contexts C__V and V__C, but that it does in V__V. So part of the force of the argument would rest on independent motivation of Glide Formation for this context. The only examples I can think of, [əzəu+ét] 'Esau' (diminutive) and [bənžui+ási] 'benzoinaceous' suggest the contrary. Therefore *caure* will have the following root alternants and thematic vowels:

(36) <u>Thematic vowel:</u> *caure, creure* (W-5, W-6, W-7) <u>Root:</u>

1,2,3,6PI; 1,2,3,6PS; 2,6Imp	Ø = I = III	káw 2,3,6PI; 2Imp F; C; Inf
4,5PI; 4,5PS, 5Imp	ɛ́ = I	
PS	é = I	káyg PS,IS,Pa, 1PI,6Imp
Ger	é	
Pa	ú	kéy 4,5PI; II; Ger; 5Imp
Inf, F, C, II	Ø	

Group W-6. It is formed by *creure* 'to believe', *seure* 'to sit', *jeure* 'to lie', *treure* 'to take from' and their compounds. They have a paradigm similar to the last group: [krɛ́w]~[káw], [krəyɛ́m]~[kəyɛ́m], [krɛ́yə]~[kéyə], but in the forms that in group W-5 take Vyg, they have Vg:

(37)

<u>1PI</u>	<u>PS</u>	<u>IS</u>	<u>Pa</u>	<u>6Imp</u>
krɛ́k	krɛ́g i	krəg és	krəg úd	krɛ́g int
	krɛ́g is	krəg ésis		
	krɛ́g i	krəg és		
	krəg ɛ́m	krəg ésim		
	krəg ɛ́w	krəg ésiw		
	krɛ́g in	krəg ésin		

The root alternants are thus the same of (36) but with g instead of yg. In addition, one verb of the group, *treure* has irregular participle [tré+t].

Group W-7. *Riure* 'to laugh' and its compounds are similar to *creure* of group W-6, but lack the root final y in all forms where *creure* has it, except for II. Compare the following forms with those in (35) for *caure* (which are similar for *creure*):

(38)	PI	II	Ger	5Imp
4	r̄i ɛ́m	r̄ɛ́y ə	r̄i ɛ́nt	r̄i ɛ́w
5	r̄i ɛ́w	r̄ɛ́y əs		
		r̄ɛ́y ə		
		r̄ɛ́y əm		
		r̄ɛ́y əw		
		r̄ɛ́y ən		

Thus, whereas *caure* of group W-5 has y after the root vowel in most forms, *creure* of W-6 lacks them before root final g, *riure* of W-7 has it only in II. Otherwise, putting participles aside, the stem forms are completely parallel.

7. On Accounting for Subregularities

In the preceding three sections, thirteen groups of verbs belonging to the "irregular" conjugation II were examined. They constitute both the bulk and the least irregular part of conjugation II. Remaining are some 17 verbs which show a greater degree of irregular variation; they will be dealt with in later sections.

The set of verbs studied can be characterized, as far as irregularity is concerned, as follows: a) high degree of irregularity in the participle (high number of verbs with different root in that tense, ∅ and ú for the thematic vowel, ∅, t, and d for the tense marker); b) few irregularities in the tense and personal markers (u and ∅ for 1PI, r and ə for Inf); c) some irregularities due to different distribution of thematic vowels ɛ, é and í; d) most irregularities due to existence of different root alternants. In this section I shall examine this last fact. It should be clear from the foregoing presentation that the stem alternants that are responsible for almost all irregularities are not just completely suppletive, unrelated morphemes. The regularities in the theme vowel can be partially captured, as has been suggested earlier, by considering conj.

II as taking the theme vowels of conjs. I and III. The tenses in which they follow I or III vary for each verb, but except for two verbs, *soler* and *valer*, if a given verb takes some thematic vowel in a given form, then the same thematic vowel is in that form in conj. I or in conj. III.

The alternations in the stem are summarized in (39):

(39) <u>Last consonant(s) in roots subject to alternation</u>

GROUP	Inf	F;C;2,3, 6PI;2Imp	II	5Imp;4, 5PI	Ger	1,2,3, 6PS	4,5PS;IS 1PI;6Imp	Pa
batre R-1	-	-	-	-	-	-	-	-
temer R-2	-	-	-	-	-	-	-	-
fondre G-1	-	-	-	-	-	g	g	see (28)
prendre G-2	-	-	-	-	-	g	g	see (28)
soler G-3	-	-	-	-	-	g	g	g
valer "	g	-	-	-	-	g	g	g
aparèixer G-4	š	š	š	š	š	š,g	š,g	g
conèixer "	š	š	š	š	š	š,g	š,g	g
beure W-1	w	w	b	b	b	g	g	g
escriure W-2	w	w	b	b	b	g	b,g	g
viure W-3	w	w	b	b	b	sk	b,sk	sk
coure W-4	w	w	-	-	-	g	g	g
caure W-5	w	w	y	y	y	yg	yg	yg
creure W-6	w	w	y	y	y	g	g	g
riure W-7	w	w	y	-	-	g	g	g

As (39) suggests, most irregularities in the allomorphic variants of the root are due to alternations in the last or last two consonants (the other cases of alternation, which are not present in (39), are the alternations prén~pén in *prendre* and the change in the stressed vowel of the stem to έ in II in *caure*, and *riure*). This fact, and the fact that a small number of alternation define by cross classification a considerable class of verbs, indicate that the root alternations are not just cases

of suppletion, and that the existing regularities ought to be expressed in the grammar.

The perhaps obvious way to capture such regularities is to set up a single underlying form for every verb root (except in real cases of suppletion), and derive the root alternants by phonological rules. Under this solution it is the phonological rule that captures the regularities. In fact, if we used "root alternations" in a broader sense, to include any surface phonetic alternation, we already have made use in the preceding discussion of phonological rules to account for such alternations: ə Insertion, D-Insertion, and several of the rules presented in Chapters 1 and 2. The verb *perdre* 'to lose', for example, which belongs to the "regular" conj. II (i.e. group R-1) like *batre*, has surface roots pέr̄d in 1PI [pέr̄du], pέr̄t in 3PI [pέr̄d], pέr̄ in 2PI [pέr̄s], and pər̄d in 4PI [pər̄dέm]. But an underlying root /pέrd/ and rules of r → r̄, Final Obstruent Devoicing, Cluster Simplification and Vowel Reduction will account for the alternations. We can thus have a homogeneous treatment of root alternations, and claim that wherever regularities exist they have to be captured by an underlying root and phonological rules that derive the surface forms that correspond to it. I would like to suggest that this approach is inadequate, and that the rules accounting for surface-root alternations are not homogeneous, but divided into two sets, MORPHOLOGICAL RULES and PHONOLOGICAL RULES.

If the rules that account for the alternations in (39) were to be considered phonological rules, they would present the following peculiar properties:

1) <u>Underlying character of input and output</u>. Whereas phonological rules can, but must not operate in terms of underlying segments, it appears that all the alternations in (39) (and any other alternation that characterizes differences among alternating verb stems) are alternation among underlying segments. Notice also that although some phonological rules effect changes in terms of underlying segments, since they are stated in terms of phonological features the same rules can effect very often other changes that don't involve underlying distinctions. The only case that might be viewed as conflicting with this claim is found in the verb *caber* to be discussed later, in section 8. There the alternation also involves stress. But it was shown in Chapter 1 that stress is present underlyingly, which allows us to save the proposed generalization.

2) <u>Indeterminacy of directionality</u>. It is a curious fact that these rules could be formulated, for any rule of the form A → B, also as B → A. In other words, there is no evidence that suggests that either A or B is the underlying segment for any given alternation A-B. Although I don't want to argue that this is ALWAYS the case for morphological rules, it is a fact that it is NEVER the case for phonological rules. For every phonological rule discussed so far there are reasons to determine the direction in which the rule has to apply. Even in cases where

this seems at first glance difficult to determine, there is evidence to decide the underlying representation and the directionality of the rule (recall, e.g., the discussion of r→r̄ in Chapter 2, section 4).

3) <u>Morphological conditioning</u>. Any careful inspection of the context in which such rules operate will reveal that there is no natural phonological context definable. This is particularly striking because the set of endings after the root being relatively small, it becomes easier to define a phonological context for any arbitrary set of forms. Although both phonological and morphological rules might mention phonological and morphological properties, it is obvious which properties are more likely to determine phonological or morphological processes.

4) <u>Segregation</u>. In all cases where the ordering of such alternations with respect to a phonological rule is crucial, the phonological rule is ordered after. In *fóng~fón*, for example, if Assimilation of Nasals and Cluster Simplification were ordered before the rule that accounts for the alternation, instead of 1PI fón and 3PI fón, we would get, depending on the directionality of the rule, 1PI fón, 3PI *fón; or 1PI *fóng, 3PI fón.

I shall illustrate these properties with the discussion of what I think is the best case for a phonological treatment of an alternation of the sort examined, namely the alternation b~w. This is the only case where there is an independent phonological rule with the same effect, the rule presented in Chapter 2 which read

(40) $b \rightarrow w / \begin{bmatrix} +syll \\ +stress \end{bmatrix} \underline{\quad} (C) \#\#$

In the three groups where this alternation occurs (W-1 *beure*, W-2 *escriure*, W-3 *viure*), the forms and contexts of appearance of b and w are the same, so I shall illustrate the alternation with just one example, *beure*:

(41) b   w

II	PI	PI	F	C
bəb íə	4 bəb έm	2 béw s	bəw ré	bəw ríə
bəb íəs	5 bəb έw	3 béw	bəw rás	bəw ríəs
bəb íə		6 béw ən	bəw rá	bəw ríə
bəb íəm	<u>5Imp</u>	<u>2Imp</u>	bəw rέm	bəw ríəm
bəb íəw	bəb έw	béw	bəw rέw	bəw ríəw
bəb íən	<u>Ger</u>	<u>Inf</u>	bəw rán	bəw ríən
	bəb ént	béw rə		

It is tempting to account for the cases where w appears word finally or before a word final consonant deriving it by (40), and extend this rule to cover the rest of the cases, namely 6PI, Inf, F, and C forms. Notice incidentally that a rule w → b would not work since it would apply to verbs where no b appears to give *[kubíə], *[kubɛ́m], *[kubɛ́nt] for *coure* (cf. (33)). Let's consider several arguments against accounting for (41) and similar cases by rule (40). First, it was argued in Chapter 2 that b → w didn't apply before a consonant, despite some instances of alternations -bV-~-wC-. Second, one would expect [bɛ́bən] and not [bɛ́wən] in 6PI. Notice that there is one way out of this objection: one could argue that the form at the time (40) applies is bɛ́b+n, i.e. root and G marker n, without any tense ending. There is some reason to take this position. Consider the 6PI forms in the three conjugations, along with some other forms (all forms from (1)):

(42)

6PI	2PI	3PI
mír ən	mír əs	mír ə
búλ ən	búλ s	búλ
bát ən	bát s	bát

ə could be just a tense marker for conj. I, and have ∅ for the tense marker of present for conjs. II, and III, ə being inserted by rule before n. But there exist a couple of verbs in conjs. II and III with root final vowel, *lluir* 'to shine', and *dur* 'to bring' (cf. section 9). Here the forms expected, if there were a ə-Insertion rule applying to 6PI, would be *[λún] and *[dún], and we get instead the forms predicted by the existence of tense marker ə, [λúən], [dúən]. Notice that formulating ə-Insertion in the environment V __ +n won't help, because then the future forms for 6 would be subject to it and we would get *[mirəráən], *[bətráən], and *[buλiráən] (cf. (1)); even for *beure* itself: *[bəwráən].

Finally, consider other verbs with root final b, *rebre* 'to receive', *concebre* 'to conceive', *saber* 'to know', *caber* 'to fit in'. In all the forms where *beure* has b (41), they show b (except for 5Imp and Ger in *saber* and *caber*, which show an additional irregularity in these tenses). But in those where w appears for *beure*, b stays (assimilated in voicing or devoiced word finally), as some of the forms illustrate:

(43)
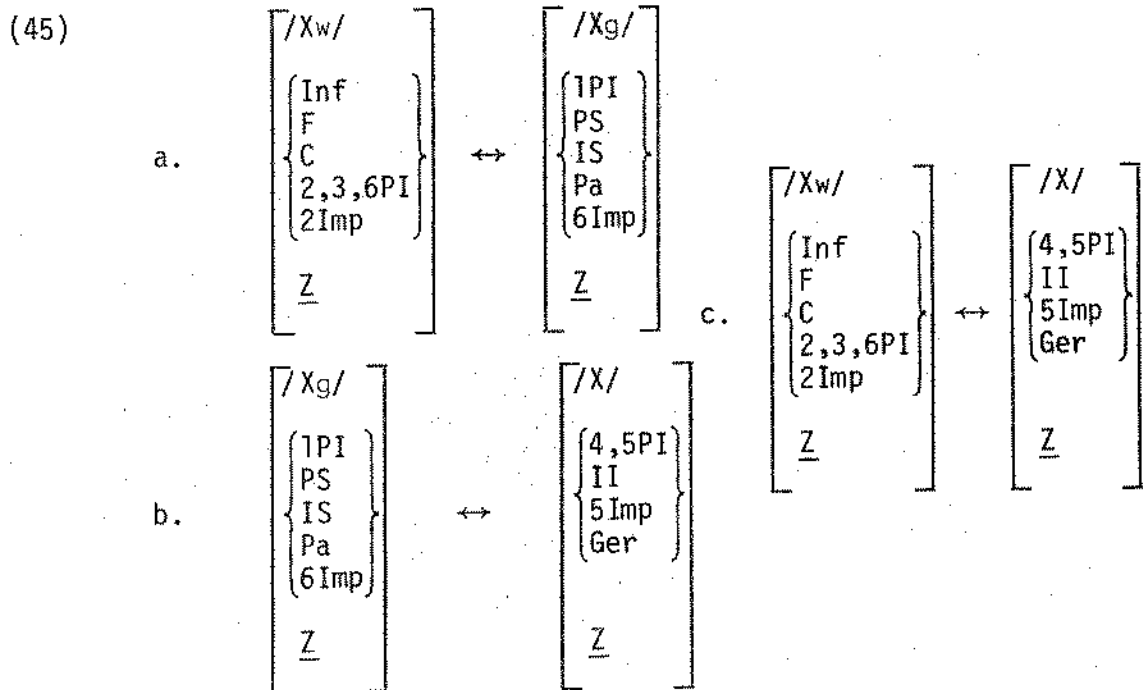
1PI	4PI	3PI	2PI	F
r̄əbíə	r̄əbɛ́m	r̄ɛ́p	r̄ɛ́ps	rəbrɛ́
kunsəbíə	kunsəbɛ́m	kunsɛ́p	kunsɛ́ps	kunsəbrɛ́
səbíə	səbɛ́m	sáp	sáps	səbrɛ́
kəbíə	kəbɛ́m	káp	káps	kəbrɛ́

The previous discussion and the four properties of root alternations suggest that they are separate from phonological rules in two respects: they are ordered before all phonological rules (therefore distinct from them, i.e. there exists a b~w alternation and a b → w rule), and they have different properties, i.e. they are characterized differently as for their form. Some of these properties were outlined above, but, being restricted here to a small domain of allomorphy, Catalan verb morphology, I will not try to give a narrower characterization of them. There is however one property that deserves special attention, namely the indeterminacy in setting up an underlying form for the root and determining the direction in which the rule operates. One might propose, seeking to overcome this difficulty, that the root of *conèixer*, for example, is kunéC with an unspecified, or perhaps partly specified, final consonant. A rule then derives the root alternants kunéš and kunég in the appropriate environments. But this approach runs into serious difficulty when faced with alternations like Ø~g, w~sk.
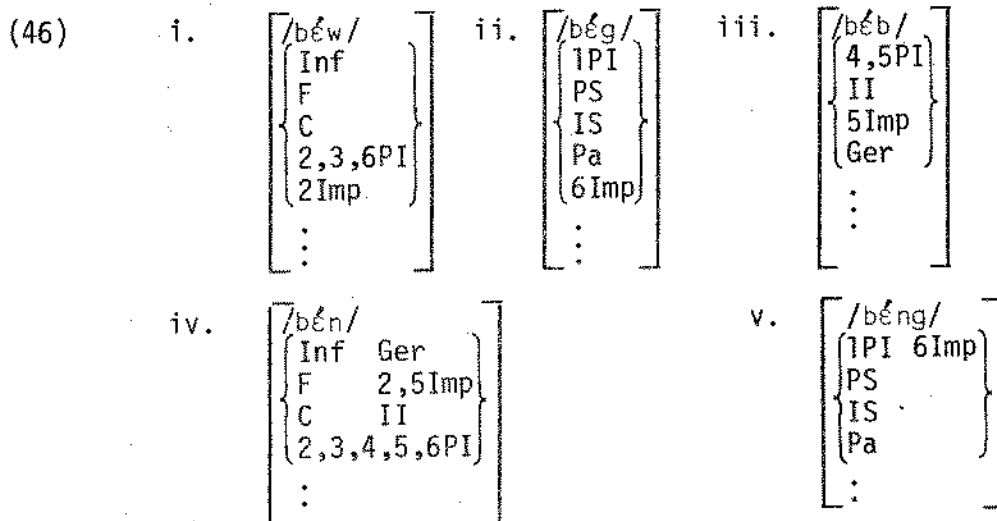
These difficulties can be overcome once a more articulate theory of the lexicon is presented. It is indeed in the lexicon where one expects to find lexical subregularities of the type discussed to be accounted for. Jackendoff (1975) presents a theory of the lexicon derived from the Lexicalist Hypothesis where lexical entries are fully specified and regularities are expressed by rules which, instead of being operative in derivations serve as means for the evaluation measure in determining the amount of idiosyncratic information in the lexicon. Thus, for example, both *decide* and *decision* are entered in the lexicon with all their phonological, syntactic and semantic properties. Instead of having a rule deriving NOUNS with the meaning X' from VERBS with the meaning X by adding the suffix *-ion*, a parallel rule will RELATE the fully specified entries. In other words, it will relate NOUNS with the meaning X' of the form Y*ion* with VERBS with the meaning X of the form Y. Such a rule expresses the generalization that deverbal nominalization with *-ion* is a morphological process in English, and is used by the evaluation measure to reflect the fact that a lexicon with *decide* and *decision* is less complex than a lexicon with *decide* and *jelly*, *ceteris paribus*. Jackendoff (1975) applies the "full entry" theory to derivational morphology, compounds, and idioms. Here I shall try to show that it can be extended to inflectional morphology (or at least irregular inflectional morphology) as well. This extension of the "full entry theory" would have as a consequence that what we have been calling root alternants will be entered separately in the lexicon. One might further assume that the whole inflected form is entered, as in Halle (1973c). I shall remain neutral with respect to this possibility. At least, then, for a verb like *coure* (group W-4), we shall have separate entries for the root alternants /kɔ́w/, /kɔ́g/ and /kɔ́/:

(44)

$$
\begin{bmatrix} /\text{kɔ́w}/ \\ \begin{Bmatrix} \text{Inf} \\ \text{F} \\ \text{C} \\ 2,3,6\text{PI} \\ 2\text{Imp} \\ \vdots \end{Bmatrix} \end{bmatrix}
\quad
\begin{bmatrix} /\text{kɔ́g}/ \\ \begin{Bmatrix} 1\text{PI} \\ \text{PS} \\ \text{IS} \\ \text{Pa} \\ 6\text{Imp} \\ \vdots \end{Bmatrix} \end{bmatrix}
\quad
\begin{bmatrix} /\text{kɔ́}/ \\ \begin{Bmatrix} 4,5\text{PI} \\ \text{II} \\ 5\text{Imp} \\ \text{Ger} \\ \vdots \end{Bmatrix} \end{bmatrix}
$$

Rules (45a, b, c) relate these lexical entries and are used by the evaluation measure to determine the relative complexity of the set of entries in (44) (as well as parallel ones). It should establish, for example, that (44) is more complex than the entries for *batre*, which has only one root *bát*, but less complex than *ser* (section 9) that has roots *síg*, *fó*, *ér*, etc. For the important question of how the evaluation measure should account for these facts, see Jackendoff (1975).

(45)

a.
$$\begin{bmatrix} /Xw/ \\ \begin{Bmatrix} Inf \\ F \\ C \\ 2,3,6PI \\ 2Imp \end{Bmatrix} \\ \underline{Z} \end{bmatrix} \leftrightarrow \begin{bmatrix} /Xg/ \\ \begin{Bmatrix} 1PI \\ PS \\ IS \\ Pa \\ 6Imp \end{Bmatrix} \\ \underline{Z} \end{bmatrix}$$

b.
$$\begin{bmatrix} /Xg/ \\ \begin{Bmatrix} 1PI \\ PS \\ IS \\ Pa \\ 6Imp \end{Bmatrix} \\ \underline{Z} \end{bmatrix} \leftrightarrow \begin{bmatrix} /X/ \\ \begin{Bmatrix} 4,5PI \\ II \\ 5Imp \\ Ger \end{Bmatrix} \\ \underline{Z} \end{bmatrix}$$

c.
$$\begin{bmatrix} /Xw/ \\ \begin{Bmatrix} Inf \\ F \\ C \\ 2,3,6PI \\ 2Imp \end{Bmatrix} \\ \underline{Z} \end{bmatrix} \leftrightarrow \begin{bmatrix} /X/ \\ \begin{Bmatrix} 4,5PI \\ II \\ 5Imp \\ Ger \end{Bmatrix} \\ \underline{Z} \end{bmatrix}$$

Notice that (45a, b) are not used just for *coure* and verbs in the same group, like *plaure* and *cloure*, but for other classes as well. (45a), for example, will relate the entries (46i) and (46ii)—and another rule (46i) and (46iii), etc.—and rule (45b) will relate (46iv) and (46v):

(46)

i.
$$\begin{bmatrix} /béw/ \\ \begin{Bmatrix} Inf \\ F \\ C \\ 2,3,6PI \\ 2Imp \end{Bmatrix} \\ \vdots \end{bmatrix}$$

ii.
$$\begin{bmatrix} /bég/ \\ \begin{Bmatrix} 1PI \\ PS \\ IS \\ Pa \\ 6Imp \end{Bmatrix} \\ \vdots \end{bmatrix}$$

iii.
$$\begin{bmatrix} /béb/ \\ \begin{Bmatrix} 4,5PI \\ II \\ 5Imp \\ Ger \end{Bmatrix} \\ \vdots \end{bmatrix}$$

iv.
$$\begin{bmatrix} /bén/ \\ \begin{Bmatrix} Inf & Ger \\ F & 2,5Imp \\ C & II \\ 2,3,4,5,6PI \end{Bmatrix} \\ \vdots \end{bmatrix}$$

v.
$$\begin{bmatrix} /béng/ \\ \begin{Bmatrix} 1PI & 6Imp \\ PS \\ IS \\ Pa \end{Bmatrix} \\ \vdots \end{bmatrix}$$

This treatment can be naturally extended to all the root alternations summarized in (39), and the cross classifying subregularities captured by redundancy rules like (45).

The four properties that distinguished root alternations from phonological rules are automatically predicted in this analysis. The underlying character of input and output is a consequence of the fact phonological information in the lexicon is represented in underlying form; thus rules relating two items in the lexicon will have necessarily that property. The indeterminacy of directionality is also a necessary consequence, since rules like (44a, b) RELATE items and do not play a role in DERIVATIONS. Finally, morphological conditioning follows also from the kind of information present in lexical entries, and the SEGREGATION of lexical redundancy rules from phonological rules is also predicted.

8. Verbs with Alternating Root Vowel

The six verbs in this class are characterized by having several of the irregularities encountered in the verbs considered so far: alternations in the last consonant of the root, irregular distribution of the theme vowel, irregularities in tense markers.

Consider the paradigm of *venir* 'to come'.

(46)

1PI	II	PS	IS	F	C	Inf,Ger, Pá,2,5, 6Imp
bíɲ	bən íə	bíŋg i	biŋg és	bin dré	bin dríə	bín drə
bén s	bən íəs	bíŋg is	biŋg ésis	bin drás	bin dríəs	bən ír
bé	bən íə	bíŋg i	biŋg és	bin drá	bin dríə	bən ínt
bən ím	bən íəm	biŋg ém	biŋg ésim	bin drém	bin dríəm	biŋg úd
bən íw	bən íəw	biŋg éw	biŋg ésiw	bin dréw	bin dríəw	bín ə
bén ən	bən íən	bíŋg in	biŋg ésin	bin drán	bin dríən	bən íw
						bíŋg int

Venir has four root alternants *bén, bé, bin, biŋg*. The distribution of the thematic vowel is also irregular, namely:

(47) <u>Thematic vowel</u>: *venir, tenir*

1,2,3,6PI; 1,2,3,6PS; 2,6Imp	$\emptyset$ = I = III
II; 4,5PI; 5Imp; Ger; (Inf)	í = III
4,5PS	ế = I
IS	é = I
(Inf)	$\emptyset$
Pa	ú

The ŋ in 1PI bíŋ and in other forms before g, as well as the epenthetic d in Inf, F, and C have been already dealt with for other verbs (see section 5). Consider now the alternation *bén~bé*. *Bé* appears only in 3PI [bé], the only form where it is word final. In Chapter 2 a rule deleting word final n after a stressed vowel was motivated, so it might be possible to reduce the root alternants to three and account for *bé* by the N-Deletion rule. But whereas in nominals the general case is deletion, and non-deletion is exceptional, in verbs the opposite is true. The only case of deletion is 3PI in *venir, tenir* and their compounds. But in other cases, even in *venir* and *tenir* in the future, there is no deletion:

(48)

prén	'he takes'	bindrán	(6F)
fón	'he melts'	tindrán	(6F)
són	'they are'		
fán	'they make'		

It would be very odd to extend the treatment of nominals to verb forms in this respect, since it would mean to mark as exceptional the majority of verbs that have a form with root final n in the context V ___ ##, and mark all the 6F forms as exceptional, too, for any verb. A more striking example that favors the treatment of *bé* as a root alternant is furnished by the compounds of *venir* and *tenir* that form 2Imp on the root *bén*, *tén*, and not on *bíng*, *tíng*. Compare 3PI and 2Imp of *prevenir* 'to prevent, to warn', *avenir* 'to get on well', *obtenir* 'to obtain', and *detenir* 'to stop, to arrest':

(49)

3PI	2Imp
prəbé	prəbén
əbé	əbén
upté	uptén
dəté	dətén

If the 3PI forms are subject to the rule and the forms of 2Imp are exceptions, the root should be marked as an exception in 2Imp but not in 3PI. Notice incidentally that here again we find a clear illustration of the property of morphological conditioning assigned to rules determining allomorphy in the preceding section. There is no hope to find a phonological environment to distinguish 3PI from 2Imp in (49), since both would be underlyingly /prə+bén/, etc.

Tenir 'to have, possess' is exactly parallel to *venir* except in 2Imp where it shows up as [tíŋgəz]. In addition to forming 2Imp on the root alternant with final g, and having the tense marker ə, the 2nd person marker z, which was replaced in Imperatives by the marker Ø in most verbs, is here extended to Imperatives also.

Poder 'to be able to', shows the following paradigm.

(50)	PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
	púk	pud íə	púg i	pug és	pud ré	pud ríə	pug ér
	pɔ́t s	pud íəs	púg is	pug ésis	pud rás	pud ríəs	pug ént
	pɔ́t	pud íə	púg i	pug és	pud rá	pud ríə	pug úd
	pud ém	pud íəm	pug ém	pug ésim	pud rém	pud ríəm	púg əz
	pud éw	pud íəw	pug éw	pug ésiw	pud réw	pud ríəw	pug éw
	pɔ́d ən	pud íən	púg in	pug ésin	pud rán	pud ríən	púg int

Here the alternations in the root vowel show up when it is stressed, for otherwise ɔ merges with u by Vowel Reduction. Notice that in root-stressed forms u appears always with the root final consonant g, and ɔ with d, which allows to set up just two root alternants, pɔ́d and púg. The t in [pɔ́ts] and [pɔ́t] is gotten through the general rules of Final Obstruent Devoicing and Voicing Assimilation, and 2Imp [púgəz] with tense marker ə and person marker z is similar to [tíŋgəz] of *tenir*. The thematic vowels are the ones typical of conj. II except for Inf and Ger where instead of lack of thematic vowel and thematic vowel é, respectively, we find a thematic vowel ɛ in both cases. Thus *poder* is similar to the verbs in G3 *soler* and *valer* in this respect.

Voler 'to want' follows the pattern of *poder*, with roots bɔ́l and búlg, but presents an anomalous form for 1PI, where instead of [búlk] we get the alternant root [búy].

Except for 1PI *saber* 'to know' and *caber* 'to fit in' have parallel forms. The root alternants of these verbs are special in that one of

them has exceptionally penultimate stress, thus originating after addition of endings the only proparoxytone verb forms in Catalan verb morphology. The roots are *káb~kápig* for *caber*, and *sáb~sápig*, and *sé* (for 1PI) for *saber*. Here is the conjugation of *caber* and the diverging 1PI of *saber*:

(51)

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
káb u	kəb íə	kápig ə	kəpig és	kəb ré	kəb ríə	kəpig ér
káp s	kəb íəs	kápig əs	kəpig ésis	kəb rás	kəb ríəs	kəpig ént
káp	kəb íə	kápig ə	kəpig és	kəb rá	kəb ríə	kəpig úd
kəb ém	kəb íəm	kəpig ém	kəpig ésim	kəb rém	kəb ríəm	kápig əz
kəb éw	kəb íəw	kəpig éw	kəpig ésiw	kəb réw	kəb ríəw	kəpig éw
káb ən	kəb íən	kápig ən	kəpig ésin	kəb rán	kəb ríən	kápig int

IPI

sé

Notice that 1PI of *caber* takes the tense ending u of R-1 group, and that the distribution of thematic vowels, with é in Inf and Ger, is the same as for *voler* and *poder*.

9.   Other Irregular Verbs

    To complete the presentation of Catalan Verb morphology, I shall extend the analysis developed in the preceding sections to the eleven remaining irregular verbs that are included in Appendix II.

    Dir 'to say'. The roots are díw, díg, déy, dí. It is similar to *riure*, group G-7, except that the root dí appears in F, C, Inf, and Pa, instead of the root with w, and root díg appears in 2,5Imp, which shows the familiar ending əz in 2 (see (50)).

    Dur 'to bring' just has three roots: dú, dúg and dúy. dú appears in the same forms as dí and díw in dir, and in addition in 2,5Imp.

    Veure 'to see'. It has the familiar roots béw, béy, and instead of the root with g it has béž (but béy appears in IS, 4,5PS and 5Imp). Notice that 1PI is béč and not béš by Final Obstruent Devoicing. The affrication of word final ž is a general process of Catalan as the following alternations show:

(52) mərážá 'to make dizzy'   mərɛ́č 'dizziness'

      bɔ́žə   'mad' (fem.)   bɔ́č   'mad' (masc.)

      r̄əžɛ́t   'small jet'   r̄áč   'jet'

      r̄užɔ́   'redness'   r̄ɔ́č   'red'

      pəsəžá 'to walk'   pəsɛ́č 'walk'

The root for Pa is bíz (see end of section 5) with tense marker t.

Fer 'to make'. The root féy is restricted to II, in this case.
The root with ž, faž, has the same distribution as in the preceding verb,
veure. The other roots are fá, fé, and f. Tense and person markers are
the regular ones (16) and (22), except for the second person marker in
2Imp.

Anar 'to go' shows the root with final ž in the same forms as the
two preceding verbs (báž). The other roots are bá (2,3,6PI) bé for 2Imp
(with person marker z), and án which takes thematic vowels of conj. III
(F and C) and of I, and has thematic vowel é in free variation with ɛ in
4,5PI; 4,5PS and 5Imp.

"*Vaig*" is the auxiliary used for the perfective preterite tense,
and is used for that reason only in the present. There are roots báž
and bárəž for 1, bá for 3 and bá and bárə for the other persons.

Eixir 'to get out' is a perfectly regular IIIb conjugation verb,
but has two alternant roots, íš and áš. Notice that this looks like a
good case for positing a phonological rule, since the alternation is
correlated with stress. However, presence of stress on the root is also
correlated with presence of a thematic vowel or a stressed desinence
(since if the ending is stressed, Destressing will wipe out the root's
stress). And, in turn, the presence of the thematic vowel and a stressed
desinence are determined morphologically. Therefore either characteriza-
tion of the environment will do. Since this alternation seems to have
the property of indeterminacy of directionality that was discussed above,
it seems more plausible to express it through a morphological rule.

Estar 'to be, to stay' has roots əstíg for PS, IS, 1PI and 2,6Imp,
and ást with thematic vowel of conj. I for the rest of the forms. In
addition to tense and person markers of 2Imp ə, z, it has the particular-
ity of extending the thematic vowel to 2,3,6PI.

Donar 'to give' has a regular conj. I paradigm, but in addition to
the regular conj. I forms it has forms with a root dóng for the forms
that typically show root final velar (1PI, PS, IS, 6Imp).

Haver 'have' has the familiar root forms áb, áž, áw, ág and the thematic vowel ế in Inf and Ger (like *soler* and *valer* of group G-3). In addition, it has monovocalic roots for PI: é and í for 1, á for 2, 3,6 and ế for 4,5. When used in the construction *haver de*+Inf, 'to have to', the 1PI has the root of 1,2,3,6PS áž. It should be noted that the forms [ás], [á], [án] can be destressed and reduced to [əs], [ə], [ən], but not in the construction just mentioned: [əmirát] 'he has looked' but [ádəmirá] 'he has to look'.

Ser 'to be' is the verb that shows more polymorphism in the root, and most suppletion also. The roots are síg, sé, fó, ér, sóg, ét, só, és. As in W-5, W-6, W-7, *dir*, *dur*, *veure*, *fer*, there is no thematic vowel in II, but this also happens in roots fó, sé, só. Person markers are regular (z in 2Imp as many verbs in conj. II) but we find the irregular tense marker rə along with the regular ríə in the conditional.

PERCEPTUAL LEVEL OF NONMAIN STRESS IN COMPOUNDS

I summarize here one of the experiments described in Mascaró (1975). Compounds of the type exemplified in (43) in Chapter 1, two-word phrases with a secondary stress and a simple word with a single stress were used to test the assumption that compounds (and some phrases) have a secondary stress in addition to the main stress (see, e.g., Marvà (1932), 405; Fabra (1912), 193-195; Badia (1951). For a different point of view, see Barnils (1933), 18-19, 28-29).

A list of 36 words or phrases containing pairs of homonyms was recorded in random order, and three subjects* were asked to identify each word with two written choices, one being the word read, the other its homonym. Four extra items were recorded at the beginning to give the subjects practice before the test. Examples of the items recorded and the words (or phrases) in the answer sheet are given below. (The vowel whose stress level has to be determined is underlined.)

Word Recorded	Answer Sheet	
Mitja nit [mìjə##nít]	*mitja nit* [mìjə##nít]	'half a night'
	mitjanit [mi̱jə#nít]	'midnight'
sistemes [sistéməs]	*sis temes* [sìs##téməs]	'six topics'
	sistemes [sistéməs]	'systems'
hipo-polar [i̱pu#pulár]	*hipo-polar* [i̱pu#pulár]	'hipopolar'
	i popular [i̱pupulár]	'and popular'

The pair of choices in the answer sheet were identical to each other phonetically, except, in principle, for the first vowel which had secondary stress (in two-word phrases like [mìjə##nít]), was unstressed (in simple words like [sistémes]) or its stress level had to be determined by the experiment.

The question to be answered then is whether the problem vowel (P) is identified with the secondary stressed vowel (S), with the unstressed vowel (U), or is kept distinct from both.

The following figure gives the results of the experiment. The stimuli are grouped according to their vowel and the vowel of the homonym presented as a second choice. Number of correct and incorrect identifications of the word (or phrase) recorded, as well as total for pairs containing and not containing a secondary stressed vowel (S) are given.

Options Presented			Answers		
A stimulus	B		correct	incorrect	total
S		P	8	1	9
S		U	10	2	12
P		S	8	1	9
P		U	11	21	32
U		S	11	1	12
U		P	19	14	33

	correct	incorrect	total	Percentage correct
Total U, P vs. S (SP, SU, PS, US)	37	5	42	88
Total U vs. P (PU, UP)	30	35	65	48

These are the basic results. However I will introduce a slight modification. It was observed after the test, that an item ([ùn##tán] 'a quantity') might have been uttered with unstressed first vowel, [un] being both indefinite article and numeral. If this were true it would belong to category U or P, but not S. The results when [un##tán] is discarded are given below. I present also the number of homonymic pairs P-U or U-P for which the same option was chosen, and related figures to be discussed directly.

Options Presented			Answers		
A stimulus	B		correct	incorrect	total
S		P	8	1	9
S		U	9	0	9
P		S	8	1	9
P		U	11	21	32
U		S	9	0	9
U		P	19	14	33

				Percentage correct
Total U, P vs. S	34	2	36	94
Total U vs. P	30	35	65	48

Number of pairs of stimuli with same/different response (same word chosen for both homonyms)

	equal	different
	19	13
after dis-carding [ùn##tán]	21	14

The main conclusions of the experiment are that for the data used there is just a binary distinction between secondary and zero stress. There is a clear distinction between S stressed words on one side, and U and P stressed words on the other (88 percent correct identification; 94 percent after correction). In addition, the subjects were unable to distinguish between U stressed and P stressed homonyms, which means that, perceptually at least, there is no stress distinction between them (48 percent correct identification). The correction introduced by eliminating one item makes the conclusion more clear, but it is sufficiently supported without the correction.

It might be objected that it is possible that subjects might have tended to choose a specific option because of some other factor such as frequency of use, likelihood to appear in isolation, etc. As the last figure in the preceding sections shows, there seems to be some tendency towards making the same choice for both homonyms. However, when the two pairs of homonyms for which the same choice was selected by the three subjects are discarded, the percentage of correct choices drops only to 45 percent, which assigns little importance to that factor.

APPENDIX II

PARADIGMS OF IRREGULAR II VERBS

dir 'to say'

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
dík	déy ə	díg i	dig és	di ré	di ríə	dí r
díw s	déy əs	díg is	dig ésis	di rás	di ríəs	di ént
díw	déy ə	díg i	dig és	di rá	di ríə	dí t
di ém	déy əm	dig ém	dig ésim	di rém	di ríəm	díg əz
di éw	déy əw	dig éw	dig ésiw	di réw	di ríəw	dig éw
díw ən	déy ən	díg in	dig ésin	di rán	di ríən	díg int

dur 'to bring'

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
dúk	dúy ə	dúg i	dug és	du ré	du ríə	dú r
dú s	dúy əs	dúg is	dug ésis	du rás	du ríəs	du ént
dú	dúy ə	dúg i	dug és	du rá	du ríə	dú t
du ém	dúy əm	dug ém	dug ésim	du rém	du ríəm	dú
du éw	dúy əw	dug éw	dug ésiw	du réw	du ríəw	du éw
dú ən	dúy ən	dúg in	dug ésin	du rán	du ríən	dúg int

veure 'to see'

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
béč	béy ə	béž i	bəy és	bəw ré	bəw ríə	béw rə
béw s	béy əs	béž is	bəy ésis	bəw rás	bəw ríəs	bəy ént
béw	béy ə	béž i	bəy és	bəw rá	bəw ríə	bís t
bəy ém	béy əm	bəy ém	bəy ésim	bəw rém	bəw ríəm	béw
bəy éw	béy əw	bəy éw	bəy ésiw	bəw réw	bəw ríəw	bəy éw
béw ən	béy ən	béž in	bəy ésin	bəw rán	bəw ríən	béž int

fer 'to make'

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
fáč	féy ə	fáž i	f és	fə ré	fə ríə	fé r
fá s	féy əs	fáž is	f ésis	fə rás	fə ríəs	fé nt
fá	féy ə	fáž i	f és	fə rá	fə ríə	fé t
f ém	féy əm	f ém	f ésim	fə rém	fə ríəm	féz
féw	féy əw	f éw	f ésiw	fə réw	fə ríəw	f éw
fá n	féy ən	fáž in	f ésin	fə rán	fə ríən	fáž int

anar 'to go'

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
báč	ən ábə	báž i	ən és	ən iré	ən iríə	ən ár
bá s	ən ábəs	báž is	ən ésis	ən irás	ən iríəs	ən ánt
bá	ən ábə	báž i	ən és	ən irá	ən iríə	ən ád
ən ém*	ən ábəm	ən ém*	ən ésim	ən irém	ən iríəm	bé z
ən éw*	ən ábəw	ən éw*	ən ésiw	ən iréw	ən iríəw	ən éw*
bá n	ən ábən	báž in	ən ésin	ən irán	ən iríən	báž int

*also ən ém, ən éw

"vaig" (defective auxiliary)

báč, bárəč

bá s, bárə s

bá

bá m, bár əm

bá w, bár əw

bá n, bár ən

eixir 'to get out'

PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
íš u	əš íə	íš i	əš ís	əš irɛ́	əš iríə	əš ír
íš əs	əš íəs	íš is	əš ísis	əš irás	əš iríəs	əš ínt
íš	əš íə	íš i	əš ís	əš irá	əš iríə	əš íd
əš ím	əš íəm	əš ím	əš ísim	əš irɛ́m	əš iríəm	íš
əš íw	əš íəw	əš íw	əš ísiw	əš irɛ́w	əš iríəw	əš íw
íš ən	əš íən	íš in	əš ísin	əš irán	əš iríən	íš int

estar 'to be, to stay'

əstík	əst ábə	əstíg i	əstig és	əstə rɛ́	əstə ríə	əst ár
əst ás	əst ábəs	əstíg is	əstig ésis	əstə rás	əstə ríəs	əst ánt
əst á	əst ábə	əstíg i	əstig és	əstə rá	əstə ríə	əst ád
əst ɛ́m	əst ábəm	əstig ɛ́m	əstig ésim	əstə rɛ́m	əstə ríəm	əstíg əz
əst ɛ́w	əst ábəw	əstig ɛ́w	əstig ésiw	əstə rɛ́w	əstə ríəw	əst ɛ́w
əst án	əst ábən	əstíg in	əstig ésin	əstə rán	əstə ríən	əstíg int

donar 'to give'

dón u, dóŋ	dun ábə	dón i, dóŋg i	dun és, duŋg és	dunə rɛ́	dunə ríə	dun ár
dón əs	dun ábəs	dón is, dóŋg is	dun ésis, duŋg ésis	dunə rás	dunə ríəs	dun ánt
dón ə	dun ábʊ	dón i, dóŋg i	dun és, duŋg és	dunə rá	dunə ríə	dun ád
dun ɛ́m	dun ábəm	dun ɛ́m, duŋg ɛ́m	dun ésim, duŋg ésim	dunə rɛ́m	dunə ríəm	dón ə
dun ɛ́w	dun ábəw	dun ɛ́w, duŋg ɛ́w	dun ésiw, duŋg ésiw	dunə rɛ́w	dunə ríəw	dun ɛ́w
dón ən	dun ábən	dón in, dóŋg in	dun ésin, duŋg esin	dunə rán	dunə ríən	dón int, doŋg int

	PI	II	PS	IS	F	C	Inf,Ger, Pa,2,5, 6Imp
haver '(to) have'							
	é,í,ắč	əb íə	ắž i	əg és	əw ré	əw ríə	əb έr
	á s	əb íəs	ắž is	əg ésis	əw rás	əw ríəs	əb έnt
	á	əb íə	ắž i	əg és	əw rá	əw ríə	əg úd
	έm	əb íəm	əg έm	əg ésim	əw rέm	əw ríəm	-
	έw	əb íəw	əg έw	əg ésiw	əw rέw	əw ríəw	-
	á n	əb íən	ắž in	əg ésin	əw rán	əw ríən	-
ser 'to be'							
	só k	ér ə	síg i	sig és, fó s	sə ré	sə ríə fó rə	sé r
	έt s	ér əs	síg is	sig ésis, sə rás fó sis		sə ríəs fó rəs	sé nt
	és	ér ə	síg i	sig és, sə rá fó s		sə ríə fó rə	sig úd
	só m	ér əm	sig έm	sig ésim, sə rέm fó sim		sə ríəm fó rəm	síg əz
	só w	ér əw	sig έw	sig ésiw, sə rέw fó siw		sə ríəw fó rəw	sig έw
	só n	ér ən	síg in	sig ésin, sə rán fó sin		sə ríən fó rən	síg int

FOOTNOTES

Chapter 1

[1]As will be pointed out later, almost all verb stems have final stress. See (5) and corresponding discussion.

[2]The first three items are either left unstressed or are wrongly stressed if instead of Minor SR, MSR applies. The forms *Helsínki* and *Helsinkí* are, I think, also found, but the same is true of *Hélsinki* (see Coromines (1971), 58), and therefore the stress rules should have a way to stress this word on the antepenultimate syllable.

[3]Wheeler includes /v/ in the phoneme inventory. The a's in (17) later reduce to ə by a rule to be discussed in section 6.

[4]See Moll (1929).

[5]See Goldsmith (1976) for an exposition of autosegmental theory. If autosegmental character was extended to stress patterns, stress, although still underlying, would not be a feature on vowels, but on a separate (autosegmental) representation. It would then be possible to have monosyllabic suffixes like *ik* with penultimate stress that would be associated later in the derivation with the syllable preceding *ik*.

[6]For the features ATR (Advanced Tongue Root) and CP (Constricted Pharynx) see Halle and Stevens (1969) and Perkell (1971), respectively. The physiological evidence available (Cerdà (1972)) is not decisive for the determination of the phonetic specification of ə with respect to [ATR]. The only motivation to characterize it phonologically as [+ATR] lies in the phonological processes to be discussed in this section.

[7]Most grammars don't register these cases, which are rather recent. Influence from Spanish must have been a determining factor, but these words show up with ɔ, ɛ, ə, etc., which are not found in Castilian Spanish, and therefore they are not just cases of foreign pronunciations.

[8]It might be possible to collapse (49a) and (49b) into a rule stating that ɔ, o reduce to u, and ɛ, e to ə unless followed by a, but this is not crucial. Notice that [-CP] is assigned to "reduced" a by convention since *[+CP, +ATR].

[9]Later in this chapter I shall treat LEXICAL EXCEPTIONS as exceptions to morpheme structure conditions rather than as exceptions to (49a).

[10]Literally [pɔ́kə] 'little', [bərɡóɲə] 'sense of shame'.

[11]It could also be o since ó becomes ɔ́ before prestressed suffixes like *ik* by a rule to be discussed later in this section.

[12]*raonament* should be underlyingly /raónámént/, the final t being deleted by Cluster Simplification, rule (28) in Chapter 2.

[13]This entails that the part of Vowel Reduction that has the effect a → ə should in fact be a separate rule, not affected by the SCC. Notice that if it is formulated as a separate rule, it won't be affected by the SCC since it will not be a neutralization rule, and therefore not cyclic.

[14]A crucial case would be a proparoxytone ending in -Vbl, which should show up as -Vbl, but as V́pl if a prestressed suffix followed, since assignment of stress by the IC-Rule would constitute introduction of specific information for the SCC. I don't know of any such case.

Chapter 2

[1]Most of the phenomena described in this chapter can be found in Badia (1951) (see however the review in Coromines (1971), 245-275), and also in a generative framework, in Lleó (1970) and Wheeler (1974).

[2][intərɛ́ŋnə] and the following examples are compounds and have therefore internal #; see Chapter 1, section 8.

[3]The first element in the cluster could be also z, since the stop is devoiced word finally and z assimilates in voicing to it.

[4]*órt és* with deletion comes out as [ɔ́rés], since the rules (17) and (18) don't apply. *gúst és* is, with deletion [gúzés] by a rule that voices continuants across ##, before a following vowel; [gúsc] and [gúsígi] by Contraction (23).

[5]The u is probably inserted between sibilant and s by a rule similar to (10) in Chapter 3.

[6]Probably also *verge* 'virgin'~*virginal* 'virginal', and *orde* '(ecclesiastic) order'~*ordenar*~'to ordain'. These are not mentioned in Fabra's list because they don't alternate in some dialects with plurals with n.

[7]w appears as a result of the rule of Glide Formation discussed in the first chapter.

Chapter 3

[1]The forms of Barcelona dialect I present here differ in some cases from Moll (1929). His data were collected in 1916 and 1920. I also

haven't included all cases of coexisting forms in Barcelona, restricting to free variant coexisting forms that are very common.

[2]The voicing specification of 2nd person sg. marker can be determined when it appears in Imperatives of some irregular verbs. In this tense a clitic can follow the verb form and the rules that devoice final obstruents and voice sibilants before vowels across don't apply. We have, e.g. (see section 8) [tíngəs] 'have!', but [tíngəzu] 'have it!'. (But for *tossir* 'to cough' a regular conj. II verb with bare root Imperative [tús] 'cough!' we have [túsi] 'cough there!'.)

[3]With the exception of two irregular verbs, *caber* and *saber* which will be discussed in section 8.

[4]/dór/ and /mént/ are phonetically [dó] and [mén] as a result of R-Deletion and Cluster Simplification discussed in Chapter 2. [plə] derives from /bl/ by B-Devoicing (Chapter 1) and ə-Insertion, rule (11) below.

[5]This analysis is not consistent with the one proposed for the interaction of Assimilation of Nasals and Cluster Simplification in Ch. 2, section 7, since roots like *fong* should be "derived" in some sense in order to allow the SCC not to block application of Assimilation of Nasals. The issue is important, but I'll leave it open.

[6]r could not have been inserted, i.e. /pén/ → [prén], etc., because then we would expect also /bén/ 'he sells' → *[brén], /dapén/ 'he depends' → *[dəprén], etc.

[7]This could seem to run against the analysis of Glide Formation presented in Chapter 1, but in nominals i does become a glide ([əlžəbráṭyk], see Chapter 1, section 5). It is worth noting that all the cases where Glide Formation doesn't apply to verbs are cases where the thematic vowel is lacking (when it is present and destressed, underlying stress prevents application of Glide Formation): [kré+∅+i], [λú+∅+i], etc.

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