CONSONANT ALTERNATIONS IN CATALAN

by

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Catalan, a Romance language spoken by approximately 8 million people, has a phonology rich in alternations. The data in this problem is taken from Standard Eastern Catalan, the dialect spoken in Barcelona and throughout northeastern Spain.

The data is divided into six sections, each of which demonstrates one phonological process, and some of the rules do interact with each other. The sections are organized so that the student can progress through the data and clearly see the rule interactions. The data described could either be presented in class or given as homework problems.

1. Obstruent Terminal Devoicing

\[
\begin{array}{lll}
\text{[}\lambda\acute{o}\text{p}] & \text{illop} & \text{'wolf (m)'} \\
\text{[}\lambda\acute{o}\beta\text{a}] & \text{illoba} & \text{'wolf (f)'} \\
\text{[k}\acute{\text{a}}\text{p}] & \text{cap} & \text{'head'} \\
\text{[k}\acute{\text{a}}\text{p\acute{e}t}] & \text{capet} & \text{'head (diminutive)'} \\
\text{[}\tilde{\text{o}}\text{m}\acute{\text{i}}\text{k}] & \text{amic} & \text{'friend (m)'} \\
\text{[}\tilde{\text{o}}\text{m}\acute{\text{i}}\text{y}\text{a}] & \text{amiga} & \text{'friend (f)'} \\
\text{[s}\acute{\text{e}}\text{k}] & \text{sec} & \text{'dry (m)'} \\
\text{[s}\acute{\text{e}}\text{k}\omega] & \text{seca} & \text{'dry (f)'} \\
\text{[f}\acute{\text{r}}\text{\acute{e}}\text{t}] & \text{fred} & \text{'cold (m)'} \\
\text{[f}\acute{\text{r}}\text{\acute{e}}\text{d\omega}] & \text{freda} & \text{'cold (f)'} \\
\text{[t}\acute{\text{t}}\text{t}] & \text{tot} & \text{'all (m)'} \\
\text{[t}\acute{\text{t}}\text{\omega}] & \text{tota} & \text{'all (f)'}
\end{array}
\]

\[2\]

I would like to thank Dan Dinnsen and Gina Hardalo for their helpful comments on earlier versions of this paper.
1. (Continued)

\[
\begin{array}{ll}
[\lambda e\check{e}] & l\text{leig} & \text{'ugly (m)'} \\
[\lambda e\acute{a}] & l\text{letja} & \text{'ugly (f)'} \\
[\delta e\text{sp\acute{a}}\check{e}] & \text{despax} & \text{'office (m)'} \\
[\delta e\text{sp\acute{a}}\check{e}\acute{u}] & \text{despatxos} & \text{'offices (m)'} \\
[\acute{g}r\acute{i}\check{a}] & \text{gris} & \text{'grey (m)'} \\
[\grave{g}r\acute{r}\acute{a}] & \text{grisa} & \text{'grey (f)'} \\
[\acute{g}r\acute{r}\acute{o}s} & \text{gros} & \text{'large (m)'} \\
[\grave{g}r\grave{r}\acute{a}s} & \text{grossa} & \text{'large (f)'} \\
[p\check{e}\check{e}] & \text{peix} & \text{'fish (m)'} \\
[p\acute{e}\acute{s}u\acute{s}] & \text{peixos} & \text{'fish (pl, m)'} \\
\end{array}
\]

Rule: [-sonorant] → [-voice] / ___ #

Final obstruent devoicing in Catalan is similar to that in many other languages (e.g. Russian, German). It is somewhat different, however, because in intervocalic position, voiced stops do not occur; rather, the corresponding voiced spirants appear (like Spanish). It is clear that an intervocalic voicing rule would not correctly account for the data, because intervocalic voiced and voiceless obstruents occur (cf. seca [seka], despatxos [dœspačus], grossa [grosa]).

2. Affricate Alternations

There are several alternations which involve affricates:

(a) \(\varepsilon \sim \varepsilon\) (non-alternating)

\[
\begin{array}{ll}
[\varepsilon \text{ski\check{c}a}] & \text{esquitxar} & \text{'to splash'} \\
[\varepsilon \text{ski\acute{c}a}] & \text{esquitx} & \text{'}a\ water\ splash' \\
[\delta e\text{spa\acute{c}e}] & \text{despatx} & \text{'}office (m)'} \\
[\delta e\text{spa\acute{c}e}\acute{u}] & \text{despatxos} & \text{'}offices (m)'} \\
\end{array}
\]
2. (Continued)

(b) ŋ ~ n

\[\text{mitja} \quad \text{mig} \quad \text{lletja} \quad \text{lleig} \quad \text{desig} \quad \text{desitjos} \]
\[
\text{mit'ja} \quad \text{mig} \quad \text{lletja} \quad \text{lleig} \quad \text{desig} \quad \text{desitjos}
\]

\[\begin{align*}
\text{mitja} & \quad \text{'half (f)}' \\
\text{mig} & \quad \text{'half (m)}' \\
\text{lletja} & \quad \text{'ugly (f)}' \\
\text{lleig} & \quad \text{'ugly (m)}' \\
\text{desig} & \quad \text{'desire (m)}' \\
\text{desitjos} & \quad \text{'desires (m)}'
\end{align*}\]

(c) ŋ ~ n

\[\begin{align*}
\text{passejar} & \quad \text{passeig} \quad \text{roja} \quad \text{roig} \quad \text{vaig} \quad \text{vagi} \quad \text{veig} \quad \text{vegi}
\end{align*}\]

\[\begin{align*}
\text{passejar} & \quad \text{'to take a walk'} \\
passeig & \quad \text{'a walk'} \\
roja & \quad \text{'red (f)}' \\
roig & \quad \text{'red (m)}' \\
vaig & \quad \text{'I go (indicative)}' \\
vagi & \quad \text{'I go (subjunctive)}' \\
veig & \quad \text{'I see (indicative)}' \\
vegi & \quad \text{'I see (subjunctive)}'
\end{align*}\]

(d) fricative alternations z ~ s; ň ~ ñ; s ~ š

\[\begin{align*}
\text{vas} & \quad \text{basos} \quad \text{gros} \quad \text{grossa} \quad \text{nas} \quad \text{nassos} \quad \text{gris} \quad \text{grisa}
\end{align*}\]

\[\begin{align*}
\text{drinking glass (m)}' \\
\text{drinking glasses (m)}' \\
\text{large (m)}' \\
\text{large (f)}' \\
\text{nose (m)}' \\
\text{noses (m)}' \\
\text{grey (m)}' \\
\text{grey (f)}'
\end{align*}\]
2d. (Continued)

\[\text{peix} \quad \text{'fish (m)'}\]
\[\text{peixos} \quad \text{'fish (pl, m)'}\]
\[\text{mateix} \quad \text{'same (m)'}\]
\[\text{mateixa} \quad \text{'same (f)'}\]

The non-alternating stems, as in (a), are best described in terms of an underlying /ɛ/ in the absence of any alternation. The data in (b) is similar to that in section (1): the voiced consonant appears intervocally and the voiceless consonant occurs word-finally, and thus the same rule of Terminal Devoicing will account for the data.

The remaining alternation, /ɛ/ - /ɔ/, is unique among other obstruent alternations in Catalan. /ɔ/ is the only voiced obstruent in the language that does not alternate with its voiceless counterpart, /ɛ/, in word-final position; rather, medial /ɔ/ alternates with word-final [ɛ] (as seen in (2c)). To establish the directionality of the process--does ɔ-ɛ or does ɛ-ɔ--it is necessary to consider all the data in (2). Since there are many examples of final [ɛ] which do not alternate with medial [ɔ] (e.g. mig/mitja [miŋ]/[miˈtja]; despats/despatxs [despaŋ]/[despaˈtʃus]), a rule converting /ɛ/ into [ɔ] in medial position would have numerous exceptions and thus items would have to be lexically-marked to undergo the rule. On the other hand, a rule converting ɔ-ɛ in word-final position would be a purely phonological, exceptionless rule. If /ɔ/ → [ɛ] word-finally, two changes are effected: /ɔ/ becomes both [-continuant] and [-voice], as shown in rule (2e):

(2) e. Stop-formation ɔ → ɛ

\[
\begin{align*}
\text{[-sonorant]} \\
\text{[-antior]} \\
\text{+_voice}
\end{align*} \rightarrow \begin{align*}
\text{[-continuant]} \\
\text{[-voice]}
\end{align*} / __ #
\]

However, it is not necessary to incorporate [-voice] in the structural change of the stop-formation rule. As was seen in (1), Catalan has an independently motivated rule of terminal devoicing. By incorporating [-voice] into rule (2e), information would be repeated and the rule's formulation would be unnecessarily complicated. Accordingly, rule (2e) is revised as follows:

(2) f. Stop-formation ɔ → ʃ (final version)

\[
\begin{align*}
\text{[-sonorant]} \\
\text{[-antior]} \\
\text{+_voice}
\end{align*} \rightarrow \begin{align*}
\text{[-continuant]} \\
\end{align*} / __ #
\]
Then the rule of Terminal Devoicing (1) will apply and convert /ʒ/ into [z].
/ʒ/ is specified in rule (2F) as [-sonorant, -anterior, +voice] so as to
distinguish it from /ʃ/ and /z/, which do not become [-continuant] word-
finally (cf. peixos [peˈʃəs] 'fish (pl)', peix [peˈʃi] 'fish'; grisə [grɪsə]
'grey (f)', gris [grɪs] 'grey (m)'). As formulated, the rule will also
apply to voiced velar obstruents. In word-final position, however, /ʒ/ →
[k] as part of Terminal Devoicing (cf. Section 1) and thus the structural
description of the rule does not need to be further restricted.

3. Strident Voicing

| [gríːs]   | gris    | 'grey (m)' |
| [gríːsə]  | grisə   | 'grey (f)' |
| [báːs]    | vas     | 'drinking glass (m)' |
| [báːsə]   | vasos    | 'drinking glasses (m)' |
| [gós]     | gos     | 'dog (m)' |
| [gósə]    | gossos  | 'dogs (m)' |
| [káːʃə]   | caça    | 'he/she hunts' |
| [káːʃə]   | casa    | 'he/she marries' |
| [peʃ]     | peix    | 'fish (m)' |
| [peʃə]    | peixos  | 'fish (pl, m)' |
| [sêk]     | sec     | 'dry (m)' |
| [sêkə]    | seca    | 'dry (f)' |
| [ɔmik]    | amic    | 'friend (m)' |
| [ɔmiˈɣə]  | amiga   | 'friend (f)' |
| [ʃɔp]     | llop    | 'wolf (m)' |
| [ʃɔˈʃə]   | lloba   | 'wolf (f)' |
| [ʃɾt]     | fred    | 'cold (m)' |
| [ʃɾˈʃə]   | freda   | 'cold (f)' |
| [pəˈʃəʒ]  | passeig | 'a walk (m)' |
| [pəˈʃəʒə] | passejar | 'to take a walk' |
[grîz i néyɾə] gris i negre 'grey and black'
[gòz əmâblə] gos amable 'friendly dog'
[gòs ətít] gos petit 'small dog'
[bàx ənòrmə] vas enorme 'enormous drinking glass'
[λòp ənòrmə] llop enorme 'enormous wolf'
[fɾèt i néyɾə] fred i negre 'cold and black'
[pèx ənòrmə] peix enorme 'enormous fish'
[pèx ətít] peix petit 'small fish'
[pèx əuník] peix bonic 'pretty fish'
[pèx nèyɾə] peix negre 'black fish'
[sèk i néyɾə] sec i negre 'dry and black'
[ənlík əmâblə] amic amable 'nice friend'
[despàj ənòrmə] despatx enorme 'enormous office'
[despàč ətít] despatx petit 'small office'
[despàj əròs] despatx gros 'large office'
[pəsəɾə ənòrmə] passeig enorme 'enormous walk'
[pəsəɾə əlärk] passeig llarg 'long walk'

Rule (3): [+strident] → [+voice] / # [+voice]

From the theoretical standpoint, this process is interesting not only because a contrast is neutralized in favor of the marked member of the opposition (e.g. ənòrmə > ənòrmə), but also because the process crucially depends on a word boundary. Given the data, students should arrive at the above rule by noting that:

a) voicing by rule only occurs across a word boundary (cf. caçà [kázə], gossos [gózus]);

b) only stridents are affected (cf. amic amable [əmíkəmáblə], even though the underlying form for 'friend' is /amig/); and,

c) strident voicing occurs in the environment of any voiced segment (i.e. vowel or voiced consonant).
4. Regressive Voice Assimilation

All obstruent clusters and all heterosyllabic obstruent-consonant
clusters agree in voice; however, voiceless obstruent-{l} clusters are
permitted syllable-initially. Assimilation occurs across word boundaries
as well as within words, as shown below:

\[
\begin{array}{lll}
[\text{ple}] & \text{ple} & \text{'full'}
\\
[\text{kláw}] & \text{clau} & \text{'key'}
\\
[\text{fló}] & \text{flor} & \text{'flower'}
\\
[\text{kréša}] & \text{créixer} & \text{'to grow'}
\\
[\text{bláw}] & \text{blau} & \text{'blue'}
\\
[\text{grós}] & \text{gros} & \text{'large'}
\\
[\text{bóska}] & \text{bosc} & \text{'forest'}
\\
[\text{putšé}] & \text{potser} & \text{'maybe'}
\\
[\text{kápsa}] & \text{capça} & \text{'pellet'}
\\
[\text{kěptá}] & \text{captar} & \text{'to beg'}
\\
[\text{ōjěktiu}] & \text{adjectiu} & \text{'adjective'}
\\
[\text{ęgyžámen}] & \text{examen} & \text{'exam'}
\\
[\text{omík}] & \text{amic} & \text{'friend (m)'}
\\
[\text{omỳga}] & \text{amiga} & \text{'friend (f)'}
\\
[\text{omíksa}] & \text{amics} & \text{'friends (m)'}
\\
[\text{káp}] & \text{cap} & \text{'no, none'}
\\
[\text{dinés}] & \text{diners} & \text{'money'}
\\
[\text{kàb dinés}] & \text{cap dinners} & \text{'no money'}
\\
[\text{žén}] & \text{gent} & \text{'people'}
\\
[\text{kàb žén}] & \text{cap gent} & \text{'no people'}
\end{array}
\]
4. (Continued)

[sentɪt] sentit 'sense'
[kàp sɛntɪt] cap sentit 'no sense'
[butɪγə] botiga 'store'
[kàb butɪγə] cap botiga 'no store'
[góč] goig 'pleasure'
[kàb góč] cap goig 'no pleasure'
[lɪt] llit 'bed, couch'
[kàb lɪt] cap llit 'no bed'
[monɛɾə] manera 'way'
[kàb monɛɾə] cap manera 'no way'
[pók] poc 'little'
[muðɛɾn] modern 'modern'
[pɔ̱g muðɛɾn] poc modern 'not very modern'
[dæsɛn] decent 'decent'
[pɔ̱g dæsɛɾ] poc decent 'not very decent'
[tɛms] temps 'time'
[pɔ̱k tɛms] poc temps 'little time'
[lɔ̱ːzik] lɔ̱ːgic 'logical'
[pɔ̱g ɔ̱ːzik] poc lɔ̱ːgic 'not very logical'
[lɛːç] lleig 'ugly'
[pɔ̱g ɛːç] poc lleig 'not very ugly'

Rule (4): [-sonorant] → [avoice] / __ [+consonant]

Condition: does not apply to pre-nuclear tautosyllabic clusters (Dinnsen 1978).
The condition allows for voiceless obstruents preceding sonorant consonants in syllable-initial position (e.g. *ple [plé], *flor [fló], *clau [kláw]). In all other positions obstruent/consonant clusters must agree in voice. The assimilation is regressive, as the second consonant in the cluster does not alternate.

As was noted under section (3), stridents voice across a word boundary when followed by a voiced segment. There is some overlap in the environments of strident voicing and regressive voice assimilation, specifically for instances of [+strident] \# [+consonant] [voice]. For example, in the phrase

<table>
<thead>
<tr>
<th>gos bonic</th>
<th>[gɔz bɔnik]</th>
<th>'handsome dog'</th>
</tr>
</thead>
<tbody>
<tr>
<td>/s/</td>
<td>( \rightarrow ) [z]</td>
<td></td>
</tr>
</tbody>
</table>

the structural description of both rules is met and the voiced value of /s/ in gos could be determined by either rule. As inferred from rules (3) and (4), the [z]'s derived from strident voicing should be identical to the [z]'s derived from regressive voice assimilation. No current phonological theory (to my knowledge) is able to identify which rule applies in cases analogous to gos bonic, although an instrumental study is currently underway (DeCesaris and Fourakis 1979) to see if there is phonetic evidence for eliminating the overlap in the two rules' environments.

5. Homorganic Stop Deletion

<table>
<thead>
<tr>
<th>(a)</th>
<th>masc.</th>
<th>fem.</th>
<th>masc. pl.</th>
<th>fem. pl.</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[sán]</td>
<td>[sánta]</td>
<td>[sáns]</td>
<td>[sántos]</td>
<td>'saint'</td>
<td></td>
</tr>
<tr>
<td>[blák]</td>
<td>[bláqkə]</td>
<td>[bláns]</td>
<td>[bláŋkəs]</td>
<td>'white'</td>
<td></td>
</tr>
<tr>
<td>[áž]</td>
<td>[ážtə]</td>
<td>[ážs]</td>
<td>[ážtəs]</td>
<td>'tall'</td>
<td></td>
</tr>
<tr>
<td>[əstúdián]</td>
<td>[əstúdiántə]</td>
<td>[əstúdiánəs]</td>
<td>[əstúdiántəs]</td>
<td>'student'</td>
<td></td>
</tr>
<tr>
<td>[kúr]</td>
<td>[kúrte]</td>
<td>[kúrs]</td>
<td>[kúrtəs]</td>
<td>'short'</td>
<td></td>
</tr>
<tr>
<td>[kélén]</td>
<td>[kélentə]</td>
<td>[kélens]</td>
<td>[kélentəs]</td>
<td>'hot'</td>
<td></td>
</tr>
<tr>
<td>[sór]</td>
<td>[sórə]</td>
<td>[sórs]</td>
<td>[sórəs]</td>
<td>'deaf'</td>
<td></td>
</tr>
<tr>
<td>[máť]</td>
<td>[mášə]</td>
<td>[mátəs]</td>
<td>[mášəs]</td>
<td>'bad'</td>
<td></td>
</tr>
<tr>
<td>[prím]</td>
<td>[prímo]</td>
<td>[prímas]</td>
<td>[prímas]</td>
<td>'thin'</td>
<td></td>
</tr>
</tbody>
</table>
5. (Continued)

<table>
<thead>
<tr>
<th>masc.</th>
<th>fem.</th>
<th>masc. pl.</th>
<th>fem. pl.</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[kuntén]</td>
<td>[kunténto]</td>
<td>[kunténs]</td>
<td>[kunténtes]</td>
<td>'content'</td>
</tr>
<tr>
<td>[mélá́t]</td>
<td>[mélá́tto]</td>
<td>[mélá́ts]</td>
<td>[mélá́ttes]</td>
<td>'sick'</td>
</tr>
<tr>
<td>[fó́sk]</td>
<td>[fó́sko]</td>
<td>[fó́sks]</td>
<td>[fó́skos]</td>
<td>'dark'</td>
</tr>
<tr>
<td>[lá́rk]</td>
<td>[lá́ryə̃]</td>
<td>[lá́rks]</td>
<td>[lá́ryə́s]</td>
<td>'long'</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>singular</th>
<th>plural</th>
<th>diminutive sg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ká́m]</td>
<td>[ká́ms]</td>
<td>[kompét] 'field'</td>
</tr>
<tr>
<td>[lá́m]</td>
<td>[lá́ms]</td>
<td>[łompét] 'ray, beam'</td>
</tr>
<tr>
<td>[trén]</td>
<td>[trénə̃s]</td>
<td>[tronét] 'train'</td>
</tr>
<tr>
<td>[kór]</td>
<td>[kórə̃s]</td>
<td>[kurét] 'heart'</td>
</tr>
</tbody>
</table>

Rule (5): $\left[\begin{array}{l}
\text{-sonorant} \\
\text{-continuant} \\
\text{antterior} \\
\text{bcoronal}
\end{array}\right] \rightarrow \emptyset / \left[\begin{array}{l}
\text{+consonant} \\
\text{+sonorant} \\
\text{antterior} \\
\text{bcoronal}
\end{array}\right] \quad ([s])$

(Obstruent stops in syllable-implosive position delete when preceded by a homorganic sonorant consonant.)

It should be pointed out that $\left[\begin{array}{l}
\text{+consonant} \\
\text{+sonorant}
\end{array}\right]$ clusters cannot occur in syllable-initial position; if such a cluster occurs word-medially, it is syllabified $\left[\begin{array}{l}
\text{+consonant} \\
\text{+sonorant}
\end{array}\right] \quad ([s])$ [+consonant], as in:

| (b) | sor $\delta\epsilon$ | 'deaf (f)' |
|     | kun $\theta\epsilon n$ $\theta\epsilon$ | 'content (f)' |
|     | až $\theta\epsilon$ | 'tall (f)' |
|     | kóm $\phi\epsilon n$ | 'little field' |

I have given the rule with an optional [s] (the plural marker) in the syllable. In fact, [s] is the only consonant which can occur in that position, and thus a more correct formulation of the rule would generalize the environment as $\left[\begin{array}{l}
\text{+consonant} \\
\text{+sonorant} \\
\text{antterior} \\
\text{bcoronal}
\end{array}\right]$ (Welsh 1977).
Homorganic Stop Deletion applies to all word classes—nouns ([kám]/[kampét]), adjectives ([blán]/[blángkø]), and also verbs ([dién] diént 'saying'/[diéntu] diént-ho 'saying it')—and thus is a purely phonological process. This will become important for the rule's interaction with the next process, N-deletion.

6. N-Deletion

<table>
<thead>
<tr>
<th>(a) masculine sg.</th>
<th>feminine sg.</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[saː] sa</td>
<td>[sá:no] sana</td>
<td>'healthy'</td>
</tr>
<tr>
<td>[prí:m] prim</td>
<td>[prí:no] prima</td>
<td>'thin'</td>
</tr>
<tr>
<td>[plá:] pla</td>
<td>[plá:no] plana</td>
<td>'level'</td>
</tr>
<tr>
<td>[sərè:] serè</td>
<td>[sərè:no] serena</td>
<td>'serene'</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>singular</th>
<th>plural</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[āni] any</td>
<td>[ānis] anys</td>
<td>'year'</td>
</tr>
<tr>
<td>[lúni] lluny</td>
<td>[nasió] nacios</td>
<td>'nation'</td>
</tr>
<tr>
<td>[trəduksió] traducció</td>
<td>[trəduksións] traduccions</td>
<td>'translation'</td>
</tr>
<tr>
<td>[kärn] carn</td>
<td>[kärns] carns</td>
<td>'meat'</td>
</tr>
<tr>
<td>[fusció] funció</td>
<td>[fusións] funcions</td>
<td>'functions'</td>
</tr>
<tr>
<td>[mudèrn] modern</td>
<td>[mudèrns] moderns</td>
<td>'modern'</td>
</tr>
<tr>
<td>[sufá:] sofà</td>
<td>[sufás] sofás</td>
<td>'sofa'</td>
</tr>
<tr>
<td>[rruβí:] robí</td>
<td>[rruβís] robís</td>
<td>'ruby'</td>
</tr>
<tr>
<td>[tέ:] te</td>
<td>[tés] tes</td>
<td>'tea'</td>
</tr>
<tr>
<td>[øyzámen] examen</td>
<td>[øyzámens] exàmens</td>
<td>'exam'</td>
</tr>
</tbody>
</table>

Rule: \([+\text{nasal}] [+\text{coronal}] \rightarrow \emptyset / [+\text{stress}] \quad \#\)

All of the words listed above in which final [n] deletes are either nouns or adjectives. In verbs, on the other hand, final [n] does not delete (Walsh 1977):
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[bén] ven 'he sells'
[bénon] venen 'they sell'
[fón] fon 'he melts'
[fónon] fonen 'they melt'
[bán] van 'they go'
[pón] pon 'he puts'
[bandrán] vendrán 'they will sell'
[ənirán] anirán 'they will go'

There are also a small number of nouns which retain final [n], e.g. [trán] tren 'train'; [kán] con 'cone'). Therefore N-deletion is an example of a morphologically-restricted rule with exceptions, and is revised as follows:

(c) N-deletion

\[ [+nasal] \rightarrow \emptyset / [+stress] \rightarrow \,^\#_{N,A} \]

7. The interaction of Homorganic Stop Deletion and N-deletion bears directly on the issue of rule ordering. Besides clearly demonstrating a counter-feeding order, the derivations point up the difference between morphological and phonological rules.

N-deletion is an opaque rule to the extent that there are nouns and adjectives which appear on the surface with final [n]. As was seen in section (5), nouns and adjectives do show a final [n] as the result of deleting a following [t]. The two rules, Homorganic Stop Deletion and N-deletion, are in a counter-feeding relationship, as can be seen in the following sample derivations:

<table>
<thead>
<tr>
<th>Counter-feeding order</th>
<th>/sant/ 'saint'</th>
<th>/kuntent/ 'content'</th>
<th>cf. /san/ 'healthy'</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-deletion</td>
<td>--</td>
<td>--</td>
<td>sa</td>
</tr>
<tr>
<td>Homo. St. Deletion</td>
<td>san</td>
<td>kunten</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>[sán]</td>
<td>[kunten]</td>
<td>[sá]</td>
</tr>
</tbody>
</table>
Feeding order (incorrect)

/sant/ 'saint' /kunten/ 'content' cf. /san/ 'healthy'

Homo. St. Deletion san kunten --
N-deletion sa kunte sa
* [sa] *[kunte] [sá]

If the rules applied in a feeding order, as they would in an unordered rules framework (Koutsoudas, Sanders and Noll 1974), then the incorrect forms * [sa] 'saint' and * [kunte] 'content' would result (as was pointed out by Roca 1976) and would predict that 'healthy' and 'saint' are homophonous. The counter-feeding order is evidently necessary to obtain the correct surface outputs. Walsh (1977) shows, however, that this instance of counter-feeding can be accounted for in the KSN framework. He notes that the rules are of two different types: Homorganic Stop Deletion is purely phonological, whereas N-deletion is morphologically restricted. Heformulates a universal principle of Morpholexical Precedence, which states "All rules which are morphologically or lexically conditioned apply before all strictly phonological rules" (1977:7) and further shows that this principle is independently needed within the KSN framework.
APPENDIX - Underlying Forms

Unless otherwise indicated, the forms listed below (by section) are those which can be derived from the data in the problem and do not always reflect the underlying forms which might be proposed in a complete Catalan grammar. For example, I have given the feminine ending as /o/ because it does not alternate in the Standard dialect, but evidence from other dialects indicates that the underlying form may be /a/. The Standard dialect is characterized by vowel reduction in unstressed position, as outlined below:

\[
\begin{array}{cc}
\text{stressed position} & \text{unstressed position} \\
\hline
\text{i} & \text{i} \\
\text{e} & \text{e} \\
\text{a} & \text{a} \\
\text{o} & \text{o} \\
\text{u} & \text{u} \\
\end{array}
\]

For further discussion, see Mascaró (1978:25-30).

Feminine singular /-o/

Masculine plural /-us/

Feminine plural /-ös/

1. /λόβ/  'wolf'
   /káp/  'head'
   /kapét/  'head (diminutive)'
   /omíq/  'friend'
   /sék/  'dry'
   /fréd/  'cold'
   /töt/  'all'
   /lěg/  'ugly'
   /despač/  'office'
   /gríz/  'grey'
   /grós/  'large'
   /pěš/  'fish'
2. /əskičár/  'to splash'*
/əskič/  'a water splash'
/daspáč/  'office'
/míž/  'half'
/lež/  'ugly'
/desźiʃ/  'desire'
/pesəżár/  'to take a walk'*
/pesźež/  'a walk'
/rráž/  'red'
/βáž/  'I go (indicative)'
/βáži/  'I go (subjunctive)'
/βěž/  'I see (indicative)'
/βěži/  'I see (subjunctive)'
/βáž/  'drinking glass'
/grós/  'large'
/nás/  'nose'
/gríž/  'grey'
/pesč/  'fish'
/motéš/  'same'

3. /gríž/  'grey'
/báž/  'drinking glass'
/góš/  'dog'
/káša/  'he/she hunts'
/kázo/  'he/she marries'
/pesč/  'fish'
/sék/  'dry'
/omlęg/  'friend'
/λób/  'wolf'
/fręd/  'cold'
/pesźež/  'a walk'
3. (Continued)

/pesəzár/  'to take a walk'*

/griz i néyre/  'grey and black'

/gos smábble/  'friendly dog'

/gos petit/  'small dog'

/baz enórmo/  'enormous drinking glass'

/lób enórmo/  'enormous wolf'

/frèd i néyre/  'cold and black'

/peš enórmo/  'enormous fish'

/peš petit/  'small fish'

/peš buník/  'pretty fish'

/peš néyre/  'black fish'

/sek i néyre/  'dry and black'

/amig smábble/  'nice friend'

/despèc enórmo/  'enormous office'

/despèc petit/  'small office'

/despèc grós/  'large office'

/pešëc enórmo/  'enormous walk'

/pešëc lárg/  'long walk' (cf. feminine [lārwy])

4. /plén/  'full' (cf. feminine [pléna])

/kláb/  'key' (cf. plural [klábæs])

/flór/  'flower'*

/krešér/  'to grow' *
4. (Continued)

/bláb/ 'blue' (cf. feminine [bláβe])
/grós/ 'large'
/dmuşk/ 'forest'
/putsó/ 'maybe'
/kápsə/ 'pellet'
/kóptär/ 'to beg'
/ojökťib/ 'adjective' (cf. feminine [ojökťibe])
/oŋžámən/ 'exam'
/omíg/ 'friend'
/káp/ 'no, none'
/dinés/ 'money'
/káp dinés/ 'no money'
/žént/ 'people'
/káp Žént/ 'no people'
/səntít/ 'sense'
/káp səntít/ 'no sense'
/bútiŋə/ 'store'
/káp bútiŋə/ 'no store'
/gőž/ 'pleasure' (cf. plural [gőžus])
/káp gőž/ 'no pleasure'
/λît/ 'bed, couch'
/káp λît/ 'no bed'
/mönèrə/ 'way'
/káp mönèrə/ 'no way'
4. (Continued)

/pōk/       'little'
/moʊdərn/   'modern'
/pək maʊdərn/   'not very modern'
/dəsɛnt/    'decent'
/pək dəsɛnt/   'not very decent'
/tɛms/      'time'
/pək tɛms/   'little time'
/loʊʒik/    'logical'
/pək loʊʒik/ 'not very logical'
/λɛʃ/       'ugly'
/pək λɛʃ/   'not very ugly'

5. /sænt/   'saint'
/blaŋk/    'white'
/ɔlt/      'tall'
/əstuəiənt/ 'student'
/kʊrt/     'short'
/kælənt/   'hot'
/sɔrd/     'deaf'
/mal/      'bad'
/prɪm/     'thin'
/kʊntɛnt/  'content'
/mələl/    'sick'
/tɔsk/     'dark'
5. (Continued)

| /lárg/  | 'long'     |
| /káp/   | 'field'    |
| /lámp/  | 'ray, beam'|
| /trén/  | 'train'    |
| /kór/   | 'heart'    |

6. /sán/       | 'healthy' |
| /prín/       | 'thin'    |
| /plán/       | 'level'   |
| /sorén/      | 'serene'  |
| /án/         | 'year'    |
| /lúñ/        | 'far'     |
| /nasión/     | 'nation'  |
| /tráduksióñ/ | 'translation' |
| /kárn/       | 'meat'    |
| /funsión/    | 'functions' |
| /muðérn/     | 'modern'  |
| /sufá/       | 'sofa'    |
| /rruðí/      | 'ruby'    |
| /té/         | 'tea'     |
| /oyzámen/    | 'exam'    |

*Word-final /z/ is deleted in verbs and in many nouns; for discussion see Mascaró (1978:65-68).*
References


