The consequences of dissimilation in Sundanese*

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1 Introduction

Studies of phonological assimilation have played a central role in the development of current phonological theory. As widely discussed in the literature, assimilation is an extremely common phonological process cross-linguistically and therefore an adequate phonological theory should represent it simply and naturally. This has led to the current view of assimilation as spreading (Clements 1976; Goldsmith 1976; Hayes 1986; among others). Much less work has addressed itself to the issue of dissimilation, but recently it has been suggested that dissimilation should be analysed as delinking followed by default fill-in (Odden 1987; Poser 1987; McCarthy 1988; Yip 1988). This approach is schematised in (1):

(1) Dissimilation as delinking

\[ +F +F \rightarrow -F +F \]

Missing value filled in by default: \([0F] \rightarrow [-F]\]

In the case of two tier-adjacent identical feature specifications, one of the specifications is delinked. The missing value is then filled in by a default rule. Dissimilation thus consists of two independent processes, delinking and default fill-in.

It has been argued that dissimilation is motivated by the Obligatory Contour Principle (OCP), the principle that adjacent identical elements are prohibited (McCarty 1985, 1988; Kisse 1988; Yip 1988). Yip (1988: 73), following earlier work by McCarthy, takes the position that 'all rules involving identity of target and trigger with an output in which they are no longer identical and adjacent are OCP-triggered rules'. It is thus an OCP violation which requires delinking of one of the offending specifications in a sequence of identical feature specifications. When this is followed by default fill-in, this yields dissimilation. Another possible result of deleting a feature matrix occurs if deletion is followed by application of redundancy rules that insert the opposite value of the
deleted feature(s)... This of course is dissimilation, and such rules are widely found in natural languages' (Yip 1988: 80-81).

Yip discusses what kind of language data would falsify the claim that such delinking is indeed motivated by the OCP:

The kind of case that would, I think, require a weakening of this claim would be a language with the following properties:

(i) Dissimilation of F: $\bar{z}F \rightarrow \bar{z}F / -\bar{z}F$

(ii) Demonstrable morpheme-internal $\bar{z}F\bar{z}F$ sequences, as opposed to doubly linked $\bar{z}F$

(ii) would show that the OCP did not operate on $\bar{z}F\bar{z}F$ sequences. It thus could not act to trigger a rule like (i).

(Yip 1988: 73)

Turning Yip's prediction around, if dissimilation is motivated by the OCP, then other aspects of the phonology, as well as underlying phonotactic patterns, should display the same restrictions. Thus we need to examine rules of dissimilation in the broader context of the lexical structure and phonology of the languages in which such rules obtain. (See Goodman 1992 for a similar argument.)

Sundanese (an Austronesian language, spoken in West Java, Indonesia) displays a case of dissimilation in the form of the plural marker. At first blush, the factors conditioning the shape of this formative appear to violate the OCP; yet upon closer inspection, we will see that the constraints motivating the dissimilation hold more generally in the lexical and phonological representations of Sundanese. Thus Yip's prediction is borne out.

In Sundanese, a formative = $ar = or = al$ marks the plural, as exemplified in (2), where $-$ indicates infixation:

(2) a. kusut $ar \rightarrow k=ar=usut$

'b. daftar $al \rightarrow d=al=ahar$

'eat' PL

'lilik $al \rightarrow l=al=itik$

'little' PL

b. visualisasi 'visualise'

\textit{di-visualisasi-kin} $ar \rightarrow \textit{di-v=ar=visualisasi-kin}$

\textit{pass-visualise- Vbl suff} PL

'visualised'

As exemplified in (2a), the plural marker, either $= ar = or = al =$, is usually infixed after the first consonant of the root. The process is highly productive, as exemplified in (2b) by the pluralisation of a recent borrowing such as \textit{visualisasi}. Verbs, adjectives and a few nouns exhibit such infixed forms. The observed pattern of allomorphic alternation is triggered by both assimilation and dissimilation. As this morphophonemic process is productive and regular, it should be accounted for by rule. The pattern of infixation also adequate account of the.

The structure of the ip of infixation. In §3, the point that the allomorphy results argued that $= ar = $ should be alternation is proposed. It is not motivated by the C markedness and for our conclude in §5. The dat Sundanese speakers ffor where what is considere

2 Infixation

Sundanese has a rich system of infixes. Both prefixes are morphologically and are full infixes, on the other hand their structural representation shape VC: $= ar = / = a$ marker is productive and the difference between Sundanese, as exemplified

(3) a. CV affixes at

i. CV+V-in

ii. CV+C-in

b. VC affixes at

i. VC+V-in

ii. VC+C-in

In (3) we observe that prefixed, whether the nIn contrast, a VC affix is initial root (3b.i), bu
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The pattern of infixation also merits attention, as it is directly related to an adequate account of the allomorphic alternation.

The structure of the paper is as follows. In §2, we consider the process of infixation. In §3, the pattern of allomorphy is presented and it is shown that the allomorphy results from both assimilation and dissimilation. It is argued that *=ar*= should be taken as underlying and an analysis of the alternation is proposed. Yet, on the face of it, the analysis of dissimilation is not motivated by the OCP as predicted, thereby posing questions about markedness and underspecification. We address these issues in §4 and conclude in §5. The data discussed here are from work with two native Sundanese speakers from Bandung, the capital of Sunda (West Java), where what is considered to be the standard dialect is spoken.

2 Infixation

Sundanese has a rich system of affixation, including prefixes, suffixes and infixes. Both prefixes and suffixes are of course extremely common cross-linguistically and are fairly straightforward to account for formally. True infixes, on the other hand, are much rarer and pose problems in terms of their structural representation. Sundanese has three infixes, all of the shape VC: *=ar*= /=ar/=, *=um*=, *=um*=. Of these, only the plural marker is productive and we thus focus our attention on it. Noteworthy is the difference between CV and VC affixes at the beginning of a root in Sundanese, as exemplified in (3):

(3) a. CV affixes at the beginning of a word
   i. CV+V-initial root = prefix di stur → di-stur
      PASS 'arrange'
   ii. CV+C-initial root = prefix di dahar → di-dahar
       PASS 'eat'

b. VC affixes at the beginning of a word
   i. VC+V-initial root = prefix anjin → ar-anjin
      PL 'you'
      ar ayim → ar-ayim
      PL 'patient'
   ii. VC+C-initial root = infix ar damaŋ → d = ar = amaŋ
       PL 'well' (ADJ)
       ar poho → p = ar = oho
       PL 'forget'

In (3) we observe that a CV affix at the beginning of a word is always prefixed, whether the root starts with a vowel (3a.i) or a consonant (3a.ii). In contrast, a VC affix at the beginning of a word is prefixed with a vowel-initial root (3b.i), but infixed after the root-initial consonant with a
A generalisation emerges: the placement of infixes in Sundanese is prosodically conditioned and has the net effect of maximising open (CV) syllables and avoiding unallowable CC sequences. (Anderson 1972 makes a similar observation.) An adequate account of infixation in Sundanese needs to incorporate this generalisation.

McCarthy & Prince (1986, 1990) argue that infixation should be analysed as melodic extraprosodicity. Following this view, they sketch out an analysis of infixation in Sundanese, whereby the initial C is extraprosodic; the infix is really a prefix; and the Onset Rule, which resyllabifies a consonant to become a syllable onset, applies twice. Their analysis is exemplified in (4) (following McCarthy & Prince 1986: 48):

\[
\begin{align*}
\text{(4)} & \quad \text{a.} \quad [nir'is] \quad \text{‘to cool oneself’ sc} \\
& \quad [nari'isi] \quad \text{PL} \\
& \quad \text{b.} \quad \begin{array}{c}
\sigma \\
\sigma \\
\sigma \\
\sigma \\
\end{array} \\
& \quad \text{c.} \quad \begin{array}{c}
ar \end{array} \\
\end{align*}
\]

The infix is proposed to have the shape in (4b). (Note that the proposed representation seems to assume underlying syllabification.) The root-initial /n/ is extraprosodic, and the Onset Rule applies twice, yielding the derived representation in (4c). Basic to this analysis is Planar Segregation (see McCarthy 1989), which assumes that separate morphemes constitute independent phonological planes. In support of their analysis, McCarthy & Prince (1986: 48) claim that ‘the representation of the affixed melody on a separate tier is independently required by Sundanese nasal harmony’.

There are a number of problems with this view:

(i) The basic insight that the infix is located prosodically, not melodically, is missed. The pattern of infixation has to do with syllable structure, not melodic structure, as implied by McCarthy & Prince’s view of melodic extraprosodicity. Under their account, all consonant-initial verbal and adjectival roots in the language would need to have an extraprosodic initial consonant.

(ii) A widely held view is that there can be no phonological interaction between separate planes, before Plane Conflation (see McCarthy 1989 and Yip 1988 for discussion). Yet several phonological rules of Sundanese refer to both the infix and the rest of the form, including nasal harmony. These processes include both lexical and postlexical ones. This would require Plane Conflation before the relevant phonology, but there is no evidence that the intervening unconfounded stage exists in the derivation.

(iii) The facts of nasal harmony do not constitute an argument in favour of the plural infix being represented on a separate tier (plane). As argued by Cohn (1990), the facts of Sundanese nasal harmony can be accounted for in a straightforward manner by a cyclic analysis within the framework of Lexical Phonology. Nasal harmony is shown to be a lexical rule, applying both before a directly for the apparent.

I propose, instead, as infixes in Sundanese are before the first mora of rules of syllabification, the case of di- is syllabic (=un= or =in= finally) or a marked syllable; before the first mora of the the placement of the if speaker knows about allowable syllable structure only affixes of the shape (mora.) How the distinctive formally encoded is an.

In order to see how syllabification are needed following syllabification

\[
\begin{align*}
\text{(5)} & \quad \text{Syllabification} \\
& \quad \text{Basic syllable str} \\
& \quad \text{a.} \quad \text{Assign a mor} \\
& \quad \text{b.} \quad \text{Each mora is} \\
& \quad \text{c.} \quad \text{Associate a p} \\
& \quad \text{d.} \quad \text{Associate a t} \\
& \quad \text{the RHYME).} \\
& \end{align*}
\]

Following Hyman (1 argued to be the basic representation of stress, t aspects of syllabification language with no unde element by rule (5a). Su are no long vowels and
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The effect of infixes on sequences of syllables in Sundanese should be sketched out in detail. In their analysis, McCarthy and Prince take a single-plane analysis of the affixal melody on the affixal syllables in Sundanese nasal harmony.

Comparatively, not melodic, but syllabic, yielding the phonological interaction of McCarthy and Prince's view McCarthy 1989 and see the rules of Sundanese (as onset).

The mora is argued to be the basic unit of phonological weight, basic to the representation of stress, tone and the syllable. As widely noted, certain aspects of syllabification are universal and others language-specific. In a language with no underlying moras, a mora is assigned to each vocalic element by rule (5a). Sundanese allows only one mora per syllable, as there are no long vowels and coda consonants do not affect the weight count;
thus each mora is dominated by a syllable (5b). Hayes (1989) captures the fact that onsets (typically) do not contribute to phonological weight by associating onset consonants directly to the syllable node (5c). Finally, in a language where coda consonants do not contribute weight, an unsyllabified consonant following a vocalic element is associated to the preceding mora (5d).

Following this view of syllabification, the plural marker of Sundanese can be correctly positioned, occurring initially with a vowel-initial root or following the first consonant of a consonant-initial root, as shown in the derivations in (6):

(6) Sample derivations

<table>
<thead>
<tr>
<th>UR</th>
<th>a. dahar</th>
<th>b. ayim</th>
<th>c. damañ</th>
</tr>
</thead>
<tbody>
<tr>
<td>syllabification</td>
<td>σ σ</td>
<td>σ σ</td>
<td>σ σ</td>
</tr>
<tr>
<td></td>
<td>d a h a r</td>
<td>a y i m</td>
<td>d a m a n</td>
</tr>
<tr>
<td>affixation</td>
<td>σ σ</td>
<td>σ σ</td>
<td>σ σ</td>
</tr>
<tr>
<td></td>
<td>d i = d a h a r</td>
<td>a r + a y i m</td>
<td>d = a r = a m a n</td>
</tr>
<tr>
<td>syllabification</td>
<td>σ σ σ</td>
<td>σ σ σ</td>
<td>σ σ σ</td>
</tr>
<tr>
<td></td>
<td>d i = d a h a r</td>
<td>a r + a y i m</td>
<td>d = a r = a m a n</td>
</tr>
<tr>
<td>output</td>
<td>[di$da$har]</td>
<td>[a$ra$yim]</td>
<td>[da$ra$ma$ñ]</td>
</tr>
</tbody>
</table>

($σ$ = syllable division)

Assuming that syllabification is either an EVERYWHERE PROCESS or applies cyclically, the root is syllabified at the beginning of the derivation, as shown in each of the three examples. Affixation then occurs, triggering a reappllication of the syllabification algorithm. In (6a), $μi$ is prefixed and syllabified as an additional syllable. In (6b) = $ar$ = is positioned before the first mora of the root. The vowel is assigned a mora and a syllable, while the consonant is syllabified as the onset of the first syllable of the root. In (6c) = $ar$ = is again located before the first mora of the root, necessarily detaching /d/ from the first root syllable. The vowel is again assigned both a mora and a syllable and then (5c) is applied twice, making /d/ the onset of the first syllable of the word and /r/ the onset of the first syllable of the root. While application of the Onset syllabic structure is assa

3 Allomorphy of the plural

As exemplified above in = $ar$ = or = $al$ =. This can be characterised in terms of the consonant and vowel (7a, b), respectively, and (8):

(7) a. Sundanese consonants

| p | t | c | k |
| b | d | j | g |
| m | n | p | n |
| s' |
| l/r |
| w | y |

(8) a. Canonical root

\[
\begin{array}{c}
R_1 \\
\sigma \ \\
O_1 \ V \ (R_1) \\
\end{array}
\]

$O = \text{onset, } R = \sigma$

$O_1, O_2 = \text{any consonant}$

$R_1 = \text{nasal home}$

few others

$R_2 = \text{most consonant}$

$C_2 = /r/, /l/ \text{ after
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...syllable of the root. While this approach is similar to McCarthy & Prince’s application of the Onset Rule, it differs in the fact that no underlying syllabic structure is assumed for the infix and all aspects of its syllabification follow from the general rules of syllabification in the language.

We see then that the simple assumption that infixes are located before the first mora of the root in Sundanese, together with independently motivated principles of syllabification, account directly for the observed location of the plural marker in Sundanese. If we refer directly to the prosodic structure, there is no motivation for representing the infix in Sundanese on a separate plane. This accounts directly for the morphological domains in which phonological rules are observed to apply in Sundanese and avoids an unmotivated stage of the derivation before Plane Conflation.

3 Allomorphy of the plural marker

As exemplified above in (2a), the plural marker may take the shape of =ar= or =al=. This allomorphic alternation is a systematic one and can be characterised in terms of the canonical root pattern of Sundanese. The consonant and vowel inventories of Sundanese are presented in (7a,b), respectively, and the canonical root patterns are schematised in (8):

(7) a. Sundanese consonant inventory  b. Sundanese vowel inventory

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>p</td>
<td>t</td>
<td>c</td>
</tr>
<tr>
<td>b</td>
<td>d</td>
<td>j</td>
</tr>
<tr>
<td>m</td>
<td>n</td>
<td>s</td>
</tr>
<tr>
<td>v</td>
<td>w</td>
<td>y</td>
</tr>
<tr>
<td>r</td>
<td>h</td>
<td></td>
</tr>
</tbody>
</table>

(8) a. Canonical root pattern of Sundanese

ROOT

O₁  V (R₁) (O₂) (C₂) V (R₂)

O = onset, R = rhyme
O₁, O₂ = any consonant
R₁ = nasal homorganic to the following stop, /r/ and (quite rarely) a few others
R₂ = most consonants, except palatal [-continuant] consonants
C₂ = /r/, /l/ after a stop (quite rare)
As schematized in (8a), most roots are disyllabic, with each syllable consisting minimally of a vowel. Both syllables have an optional onset (O₁, O₂), typically consisting of a single consonant, although in the second syllable, a stop may be followed by a liquid (C₃). Both syllables may have an optional consonant in the rhyme (R₁, R₂). These root patterns are exemplified in (8b).

As shown in the chart in (9), the allomorphic alternation between =ar= and =al= is conditioned by the presence of either /r/ or /l/ in the root. If neither /r/ nor /l/ is present, the =ar= variant is used.⁸

(9)

O₁
rVCVC
rabit ‘wounded’
riwat ‘startled’

R₁
CVRVC
hormat ‘respect’
parecka ‘handsome’

O₂
CV(OrVC
di-kirim ‘sent’
curiga ‘suspicous’

C₂
CV(CrVC
combrek ‘cold’
motret ‘take a picture’

R₂
CVCVr
bocor ‘leaking’
bintar ‘rich’

CVICVC
lิlēl=VCVC
lิlēl=ītik
lิlēl=āga

CVICVC
C=al=VCVC
p=al=ārmat
p=al=ārceeka

CV(C)VC
c=al=irim
C=al=uriga

CV(C)IVC
g=al=Silis
 gulat ‘stretch’

C=al=VCVC
C=al=VCVC
C=al=VCVC
C=al=VCVC

C=al=VCVC
b=al=ācor
b=al=āgbar

CVCI
C=al=VCVC
b=al=ācor
m=al=āhul

CVCI
C=al=VCVC
b=al=ācor
m=al=āhul

Consider first roots not having a root-initial variant. But in the case form appears with the either of the first two a variant appears with the the first syllable or second second member of a cot onset of a third syllable =al= variant. The pat study are very consist Robins (1959: 343): ‘T-al- is used with form containing a following r Words of any other str

With /l/-initial roots, to the initial /l/ (box i beginning of the first or two /r’s (boxes (b–c)) facts, then, in the next s rules should obtain.

In order to account for the assimilation process for account for the assimilating /r/-dissimilation, respect specified for the feature

Following the view Lateral Assimilation to a root-initial /l/:

(10) Lateral Assimilation

\[ \sigma - \sigma \]

[+lat] [-lat]

When the /r/ of the the [+lateral] specific concomitant delinking of [ ]

As discussed in §1, d
Consider first roots containing /l/. If an /l/ occurs anywhere in the root, except root-initially, the infixed form appears with the \(-ar=\) variant. But in the case of a root-initial /l/, as seen in box (a), the infixed form appears with the \(-al=\) variant. In the case of roots with /r/, if either of the first two syllables starts with an /r/ (O₁ or O₂), the infixed variant appears with the \(-ar=\) variant. But if /r/ occurs in the rhyme of the first syllable or second syllable (boxes (b), (d), respectively) or as the second member of a complex onset to a second syllable (box (c)) or as the onset of a third syllable (box (e)), then the infixed form occurs with the \(-al=\) variant. The patterns observed for the two speakers in the present study are very consistent and concur with the observations made by Robins (1959: 343): 'The variants -ar/-al- are contextually determined; -al- is used with forms whose initial consonant is I, and with those containing a following r, except as initial consonant of the second syllable. Words of any other structure regularly infix -ar-.'

With /l/-initial roots, we have a case of assimilation: the infix assimilates to the initial /l/ (box (a)). When an /r/ occurs in the root, except as the beginning of the first or second syllable, we have assimilation between the two /r/’s (boxes (b-e)). I first propose an analysis to account for these facts, then, in the next section (§4), I will turn to the question of why these rules should obtain.

In order to account for the observed pattern of allomorphy, I assume that the underlying form of the infix is \(-ar=\) and propose two rules to account for the assimilation and dissimilation: Lateral Assimilation and /r/-dissimilation, respectively. I assume that only the liquids /l/r/ are specified for the feature [lateral] in Sundanese.

Following the view of assimilation as spreading, I propose a rule of Lateral Assimilation to account for the assimilation of the /r/ of the infix to a root-initial /l/:

\[ \text{(10) Lateral Assimilation} \]

\[ \sigma \quad \sigma \]

applies to /r/ of the plural marker, between two adjacent syllables

\[ [+\text{lat}] \quad [-\text{lat}] \]

When the /r/ of the infix is preceded by an /l/ in the previous syllable, the [+lateral] specification of the /l/ spreads to the right, with concomitant delinking of [-lateral].

As discussed in §1, dissimilation has been argued to consist of delinking...
of two tier-adjacent identical feature specifications, followed by default fill-in of the missing value. Following this approach, /r/-dissimilation can be represented as follows:

\[
\begin{array}{c}
\text{applies to } /r/ \text{ of the plural marker} \\
[-\text{lat}] [-\text{lat}] & \rightarrow & [+\text{lat}] [-\text{lat}]
\end{array}
\]

a. The first [-lat] is delinked (due to tier-adjacent [-lat] specifications).

b. 
\[
\begin{array}{c}
[-\text{cons}] \\
[+\text{son}] \\
[-\text{nass}] \\
[\text{[lat]]}
\end{array}
\rightarrow [+\text{lat}]
\]

When the /r/ of the plural infix is followed by a tier-adjacent [-lateral] specification, the first lateral specification is delinked. Delinking is then followed by a rule filling in a [+lateral] specification for liquids unspecified for [lateral]. Note, however, that the filling-in of [+lateral] is not a general default rule in Sundanese, as /r/ appears to be less marked than /l/, an issue we return to below. However, the rule as stated does not account for the fact that delinking is blocked if the second [-lateral] specification occurs as the onset of the second syllable. Thus it wrongly predicts that the plural of /curiga/ would be *[caluriga], rather than the attested [earuriga]. This condition on the rule is a point we return to below in §4.2.

Sample derivations of both Lateral Assimilation and /r/-dissimilation are presented in (12):

\[
\begin{array}{c|c|c|c}
\text{UR} & \text{a. kusut} & \text{b. litik} & \text{c. dahar} \\
\hline
\text{syllabification} & \sigma & \sigma & \sigma & \sigma \\
\text{infixation} & \mu & \mu & \mu & \mu \\
\text{input} & \text{k} & \text{a} & \text{r} & \text{u} & \text{s} & \text{t} & \text{l} & \text{a} & \text{r} & \text{i} & \text{t} & \text{i} & \text{k} & \text{d} & \text{a} & \text{r} & \text{a} & \text{h} & \text{a} & \text{r}
\end{array}
\]

4 Problems and i

Although the allophones forwardly under the pr this view of dissimilat specification? (ii) Is Lateral Assimilation? (iii) Why is /r/-dissimilation occur as onsets of two
ions, followed by default each, /r/-dissimilation can
to /r/ of the
marker

r-adjacent [-lat]

a tier-adjacent [-lateral] linked. Delinking is then on for liquids unspecified [+lateral] is not a general less marked than /l/, an sted does not account for [-lateral] specification it wrongly predicts that rather than the attested e return to below in §4.2, on and /r/-dissimilation
c. dahar

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syllabification

\[ \begin{array}{c}
\sigma & \sigma & \sigma \\
\mu & \mu & \mu \\
k = a r = u s u t & l = a r = i t i k & d = a r = a h a r
\end{array} \]

Lateral
Assimilation

[+lat] [-lat]

/r/-dissimilation

a. delinking

[+lat] [-lat]

b. [+lat]-insertion

[+lat] [-lat]

output

[karasut] [lalitik] [dalahar]

In each case, the root is first syllabified, following the principles of syllabification discussed in §2. The plural marker =ar= is then inserted before the first mora of the root. This results in resyllabification. In (12a), as there are no /r/’s or /l/’s in the root, neither Lateral Assimilation nor /r/-dissimilation is applicable, resulting in the form [karasut]. In (12b), the root-initial consonant is an /l/, which triggers the application of Lateral Assimilation. The [+lateral] specification of the root-initial /l/ spreads to the /r/ of the infix, triggering delinking of the [-lateral] specification, resulting in the form [lalitik]. In (12c), Lateral Assimilation is not applicable, but /r/-dissimilation is, due to the root-final /r/. The [-lateral] specification of the /r/ of the infix is delinked and a [+lateral] specification is inserted, giving the form [dalahar]. We see, then, that the two proposed rules, Lateral Assimilation and /r/-dissimilation, basically account for the observed allomorphy of the plural marker in Sundanese.

4 Problems and issues

Although the allomorphy of =ar= =al= is accounted for straightforwardly under the proposed analysis, some questions arise. (i) How does this view of dissimilation relate to questions of markedness and underspecification? (ii) How general are the rules of /r/-dissimilation and Lateral Assimilation? Do they apply only to the /r/ of the plural marker? (iii) Why is /r/-dissimilation blocked if the two [-lateral] specifications occur as onsets of two adjacent syllables? In other words, why tolerate
closer /r/’s, but not ones farther away? We address the first question in §4.1 and the remaining questions in §4.2.

4.1 Dissimilation: markedness and underspecification

Adequate formal accounts of dissimilation need to address issues of markedness and underspecification. In order to consider the nature of these issues, we turn to liquid dissimilation in Latin. As discussed by Steriade (1987: 351):


These facts can only be accounted for if both + and – specifications are present within the class of liquids at the time that the rule applies, since an intervening /r/ blocks dissimilation between two /l/’s. As argued by Steriade, these facts can be accounted for directly under the view of Contrastive Underspecification, whereby both values of a feature are specified within a contrasting class (in this case the class of liquids) and no value is specified otherwise, as exemplified in the following derivation: 10

\[
\begin{array}{c|c|c}
\text{Liquid Dissimilation} & \text{milit-alis} & \text{litor-alis} \\
\text{a. delinking} & \text{milit-alis} & - \\
& \text{+l} & \text{+l} \\
\text{b. default fill-in} & \text{milit-aris} & \text{litor-alis} \\
[ ] & \text{-l} & \text{-l} & \text{-l} & \text{-l} & \text{+l} & \text{+l} \\
\text{output} & [\text{militaris}] & [\text{litoralis}] \\
\end{array}
\]

Following a view of Radical Underspecification (Kiparsky 1982; Archangeli & Pulleyblank 1986; among others), in which only one value is specified underlyingly, a default fill-in rule must apply before dissimilation to block the application of dissimilation in cases such as [litoralis]. But the rule must only provide default values to /r/, not to any other consonants, since only an intervening /r/, not any other intervening consonant, blocks the application of the rule. Since delinking is followed by default fill-in,
then separate default fill-in rules must apply before and after delinking, as exemplified in (14):

\[
\begin{array}{l}
\text{(14) phonological} \\
\text{input} \\
\text{default fill-in} \\
\text{[+cons [+]son [+]nas] \rightarrow [-L]} \\
\text{Liquid Dissimilation} \\
\text{a. delinking} \\
\text{[militaris]} \\
\text{[militaris]} \\
\text{b. default fill-in} \\
\text{[litoralis]} \\
\text{[militaris]} \\
\text{[litoralis]} \\
\text{output} \\
\end{array}
\]

As argued by Steriade (1987), these facts constitute a strong argument in favour of Contrastive Underspecification, since there is no independent evidence of the stage before the first default rule applies.\(^{11}\)

As observed by Odden (1987: 237), following the assumption that ‘default rules introduce unmarked feature values…this entails that the results of dissimilations should be relatively [less marked].’ For the feature [lateral], [+lateral] is usually assumed to be the marked value (as are + values in general) and thus liquid dissimilation in Latin is consistent with this prediction.

The facts of dissimilation in Sundanese are quite similar to those of liquid dissimilation in Latin, except that in Sundanese, the dissimilation is triggered by /r/, not /l/; thus /l/, not /r/, gets filled in by default. This difference could be accounted for if we assume that markedness relations are language-specific (though contra the basic notion of markedness) and that Sundanese differs from Latin in that it is /r/, and not /l/, that is marked in the former. Unfortunately this view is not tenable, as within the phonology of Sundanese, /r/ appears to be less marked, e.g. it has a broader phonotactic distribution. It is not then a difference in markedness per se that accounts for the difference between dissimilation in Sundanese and Latin. In the case of Latin, dissimilation results in unmarked segments (as predicted by Odden) while in Sundanese, dissimilation applies between unmarked segments resulting in marked ones. Kaisse (1988) makes a similar observation based on the facts of continuant dissimilation in Modern Greek. Dissimilation occurs between two ad-
adjacent obstruents that agree in continuancy, resulting in the delinking and feature fill-in of both values of the feature [continuant]. Thus, although an attractive suggestion, the view that feature specifications lost due to the delinking of tier-adjacent identical specifications are filled in by general default rules cannot be maintained.

The fact that dissimilation may occur between unmarked values poses additional problems for a Radical Under specification account of dissimilation. Following Radical Under specification, it is generally assumed that it is marked values that are specified underlingly (though cf. Archangeli & Pulleyblank 1989). Thus in Sundanese, only [+lateral] would be specified underlingly. But before dissimilation applies, default fill-in must provide [-lateral] specifications to /r/’s, but not to other consonants, since it is between /r/’s that dissimilation occurs. Yet following delinking, it is [+lateral] specifications that must be provided to account for the observed outputs. Thus again two fill-in rules are required, the first to assign [-lateral] specifications to /r/, the second to reassign [+lateral] specifications to those /r/’s which lose their lateral specifications.

We conclude then that the facts of dissimilation in Sundanese lend additional support to the conclusion that both values are specified within a contrasting class, as dissimilation itself requires the presence of [-lateral] specifications. The facts of Sundanese, however, argue against the view that dissimilation necessarily occurs between more marked values, resulting in less marked ones. But following Contrastive Under specification, this poses no formal problem, since both values are present underlingly and plausibly either could be filled in by rule after dissimilation applies. In the case of Latin, it is the unmarked [-lateral] specification that is inserted after delinking, while in Sundanese it is the [+lateral] specification which is filled in.

4.2 Dissimilation and the OCP

Dissimilation in Latin and Sundanese differ, at least superficially, in another respect: in Latin the process of dissimilation is seen to be strictly local (on the [lateral] tier), while in Sundanese dissimilation appears to apply between /r/’s which are farther apart and not ones that are closer together, e.g. /s=ar=idor=/--[saliidoru], but /r=ar=ahit/>=[rarahit]. This brings us back to the two remaining questions posed at the beginning of this section, repeated here: (i) How general are the rules of /r/-dissimilation and Lateral Assimilation? Do they apply only to the /r/ of the plural marker? (ii) Why tolerant /r/’s which are close to each other? These cases appear to be violations of the OCP, unless they constitute doubly linked structure. We turn now to these questions.

Other cases of dissimilation of /r/’s occur in Sundanese, as exemplified in (15):

(15) Other cases of dissimilation are:

a. in borrowed forms
b. other morphologically complex forms, A
c. parallel to a prefix and an affix in Sundanese which
   occur across word boundaries or between a prefix and a prefix

As exemplified in (15a), which contain two /r/’s.

...
The consequences of dissimilation in Sundanese

(15) Other cases of dissimilation of /r/’s

a. in borrowed forms: rapor, also lapor or rapot ‘report’
   direktur, also dalektur ‘director’

b. other morphologically complex forms:
   i. para putra\textsuperscript{12} → pala putra
      pl. ‘young male’
   ii. pira(g)+kadar ‘type’ ‘fate’
   iii. balo+siar ‘thing’ ‘seek’
      → pilakadar ‘only’
      balansiari ‘seek a livelihood’

(Eringa 1949: 95)

As exemplified in (15a), dissimilation may occur in borrowed forms which contain two /r/’s. Dissimilation also occurs in other morphologically complex forms. As noted by Eringa (1949), in certain cases it may occur across word boundaries, in a phrase (15b.i), in a compound (15b.ii) or between a prefix and a root (15b.iii). \textit{barar-} is the only other indigenous affix in Sundanese which has an /r/ in it. In these cases, dissimilation is optional, but this is not surprising, as the rule may be less apt to apply across stronger phonological boundaries, such as a word boundary. Additionally, the prefix \textit{barar-} may function more like a compound than a prefix. The occurrence of dissimilation in such cases, although optional, suggests that dissimilation in Sundanese is a more systematic process in the language, not limited only to the plural marker.

As discussed in §1, if dissimilation is indeed motivated by the OCP, then morpheme structure constraints would be expected to parallel the observed rules and any tier-adjacent identical feature specifications which occur morpheme-internally must be doubly linked structures, rather than a sequence of identical values. In order to test this claim, let us examine the distribution of morpheme-internal liquids in Sundanese.

In considering constraints first on /r/’s, then on /t/’s and /l/’s, quite striking phonotactic constraints emerge. The following generalisations are based on rough calculations from the \textit{Kamus Umum Basa Sunda} (Lembaga Basa & Sastra Sunda 1985), the most complete dictionary of Sundanese, with an estimated 17,000 entries. These observations are based on a consideration of /r/- and /l/-initial forms.

Of approximately 960 /r/-initial entries, 105 have more than one /r/.

These 105 cases fall into the following three patterns:

(16) Phonotactic constraints on /r/’s (\ldots = additional segments)

\begin{tabular}{llll}
\textbf{pattern} & \textbf{no.} & \textbf{examples} \\
\hline
\textit{a}. \textit{iV}_1V_2\ldots & 67 & 57 V_j = V_2 & rara ‘braid’ \\
& & = copying of 1st & sya\textsuperscript{\textit{ro}}d ‘pull in (as in} \\
& & syllable & \textit{string of a kite} \\
\end{tabular
b. rVCrVC 20 V₁C₁ = V₂C₂
= copying of CVC
ragrag ‘fall’
nribii ‘arms overly full’
c. r...t 18 17 are recent
borrowings
radar ‘radar’
restoran ‘restaurant’

As summarised in (16a), in the majority of /r/-initial cases with two /r/’s, (67 forms), the form consists of a /rVrV.../ sequence, where the second /r/ is the onset of the second syllable. In 57 of these 67 cases, the first and second vowels are the same, thus they constitute a PHONOLICAL COPY of the first syllable. As shown in (16b), in 20 cases the /r/’s are onsets to the first and second syllables, both of which are heavy. In 19 of these 20 cases, the vowel and consonant of the rhyme in the first and second syllables are the same, thus the forms consist phonologically of a copy of a monosyllabic form. Finally, as shown in (16c), in 18 cases there is a second /r/ in the form, not occurring as an onset to the second syllable. Of these 18 cases, 17 are clearly recent borrowings. Based on /r/-initial forms, we conclude that roots with two /r/’s in the indigenous vocabulary are almost non-existent, unless the form involves a phonological copy of the first syllable. In addition there are no cases with /r/’s in both the onset and rhyme of the same syllable.

Constraints also obtain on the distribution of /r/’s and /l/’s. Although /r/’s and /l/’s may co-occur in some positions within the word, clear restrictions apply in cases with /r/ and /l/ in the onset of the first two syllables:

(17) Phonotactic constraints on /r/’s and /l/’s

<table>
<thead>
<tr>
<th>pattern</th>
<th>no.</th>
<th>examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>rVIV...</td>
<td>4</td>
<td>are recent borrowings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>relatip ‘relative’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rolet ‘roulette’</td>
</tr>
<tr>
<td>IVrV...</td>
<td>26</td>
<td>are recent borrowings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lori ‘small train’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>larab ‘arithmetic’</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>have an alternate form</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lirih ~ lirih ‘talk softly’</td>
</tr>
<tr>
<td></td>
<td>/rVrV/</td>
<td></td>
</tr>
</tbody>
</table>

As summarised in (17a), of the approximately 960 /r/-initial roots, the pattern /rVIV.../, with /r/ as the onset of the first and /l/ as the onset of the second syllable, only occurs in four forms and all four of these forms are recent borrowings. As shown in (17b), of the approximately 990 /r/-initial entries, 26 are of the shape /IVrV.../, where /l/ is the onset of the first and /r/ the onset of the second syllable. Of these 26 cases, four are recent borrowings and of the remaining cases, twelve have alternate forms of the shape /rVrV.../. Thus we see that forms of the shape /# [lateral] V [-lateral] V.../ are rare, and when they occur they often have an alternate form of the shape /rVrV.../.

The following general morphologically complete the onset of adjacent syllable. (ii) There is a t of the initial two syllable in answer to the se distribution of two /r/’s than just in the context (optionally) in other m boundaries. Basic phon Although the behaviour a strong tendency again initial two syllables of t Sundanese display the alternation of the plural

This leads us to our indeed motivated by the should display similar sequences of /r/’s are dissimilation is motiv able to an-adjacent like speci however, in Sundanese applies between more di situation? First we note Sundanese, even if they are still tier-adjacent syllables tolerated? If w of constituting two disc counterexamples are ju sequence of identical doubly linked, as illust

(18) a. tara

Such a representation i vowels are specified derivationally. In con violation.

If two /r/’s as the complex forms also cor why just in these case /r/’s constitute a linke these cases involve lin account for this, I pro
The consequences of dissimilation in Sundanese

The following generalisations emerge: (i) In both monomorphemic and morphologically complex forms, two /r/’s are avoided unless they are in the onset of adjacent syllables, usually a phonological copy of an initial syllable. (ii) There is a tendency to avoid two unlike liquids in the onsets of the initial two syllables of a form.

In answer to the second question, we see that constraints on the distribution of two /r/’s and /l/’s hold much more generally than just in the context of the plural marker. /r/-dissimilation applies (optionally) in other morphologically complex forms and across word boundaries. Basic phonotactic patterns also conform to such constraints. Although the behaviour of Lateral Assimilation is less systematic, there is a strong tendency against dissimilar liquids occurring as onsets of the initial two syllables of the form. Thus other aspects of the phonology of Sundanese display the same restrictions exhibited by the allomorphic alternation of the plural marker.

This leads us to our third question. Yip argues that if dissimilation is indeed motivated by the OCP, then other aspects of a phonological system should display similar constraints. As predicted by Yip, we find that sequences of /r/’s are constrained more generally in Sundanese. Yet if dissimilation is motivated by the OCP, it should always apply between tier-adjacent like specifications (as seen to be the case above in Latin); however, in Sundanese dissimilation is blocked between closer /r/’s, but applies between more distant ones. How can we account for this surprising situation? First we note that in the more distant cases of dissimilation in Sundanese, even if the /r/’s are separated by as much as two syllables, they are still tier-adjacent. But why are /r/’s in the onset of two adjacent syllables tolerated? If we assume that these /r/’s are doubly linked instead of constituting two discrete [-lateral] specifications, then these apparent counterexamples are just as predicted. This suggests that underlyingly a sequence of identical liquids in two adjacent syllable onsets must be doubly linked, as illustrated in (18a):

(18) a. r ara b. * r ara

\[\neg\text{-lat} \quad \neg\text{-lat}\]

Such a representation is plausible, since there is no reason to assume that vowels are specified for the feature [lateral], either underlyingly or derivationally. In contrast, the structure in (18b) would be an OCP violation.

If two /r/’s as the onsets of adjacent syllables in morphologically complex forms also constitute linked structures, we have an explanation of why just in these cases /r/-dissimilation is blocked. If the two adjacent /r/’s constitute a linked structure, no OCP violation would occur. But if these cases involve linked structures, these must be created by rule. To account for this, I propose a rule of Lateral Node Merger:
Identical lateral specifications in adjacent syllable onsets are merged into a single lateral feature specification. (This rule is represented under the assumption that only segments in the onset are directly dominated by the syllable node, following Hayes 1989.) Lateral Node Merger applies before /r/-dissimilation, thereby bleeding it. The rule of Lateral Node Merger accounts for the fact that /r/-dissimilation does not apply if an /r/ constitutes the onset of the first or second syllable of a root. In addition, /r/-dissimilation is not restricted to the /r/ of the plural marker, as was assumed above.

Sample derivations exemplifying both Lateral Node Merger and /r/-dissimilation are presented in (20):

(20) Sample derivations

<table>
<thead>
<tr>
<th>UR</th>
<th>a. dahir</th>
<th>b. riiwat</th>
<th>c. curiga</th>
</tr>
</thead>
</table>

*infixation and syllabification*

<table>
<thead>
<tr>
<th>a. delinking</th>
<th>(da) • (aha) •</th>
</tr>
</thead>
<tbody>
<tr>
<td>[−lat] [−lat]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. [−lat]-insertion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(da) • (aha) •</td>
</tr>
<tr>
<td>[−lat] [−lat]</td>
</tr>
</tbody>
</table>

*output*

<table>
<thead>
<tr>
<th>dalahir</th>
<th>riiwat</th>
<th>curiga</th>
</tr>
</thead>
</table>

In (20a) the environment for adjacent [−lateral] specification, application of /r/-dissimilation, and initial root, the onset of an adjacent syllable Node Merger, as noted above, in this case is observed instead of the /r/-dissimilation. This can be accounted for by having a more general constraint which disallows in Sundanese any root of the /r/ of the root in an onset, e.g., *motret*, /r/ as a thing special about the Sundanese grammar. Node Merger in these cases, both Node Merger and /r/-allomorphy of the plural, can be accounted for (as summarised in [9]).

Finally, consider the /l/-initial roots, e.g., *garil*, for the proposed rule outcome of the rule of avoid sequences of two syllables of a word (**/# both /r/- and /l/-initial Assimilation look suspect except that the lateral spillover that Lateral Assimilation could be accounted for also). Two observations leading to a less systematic than the variant of the plural for roots where /l/ appears in *garil*, not *galilis*. Limited by the environment parallel is interesting, both Lateral Assimilation...
In (20a) the environment for Lateral Node Merger is not met: the tier-adjacent [-lateral] specifications create an OCP violation, triggering the application of /r/-dissimilation. But, as exemplified in (20b), with an /r/-initial root, the outcome of infixation is a sequence of two /r/’s in the onset of adjacent syllables, which meets the structural description of Lateral Node Merger, thereby bleeding the application of /r/-dissimilation. Similarly, if the onset of the second syllable is an /r/, as shown in (20c), this also results in a sequence of two /r/’s in adjacent onsets, again triggering Lateral Node Merger.

As noted above, in a few cases where O₁ or O₂ is an /r/, =al= is observed instead of the expected =or=, or both forms are acceptable. This can be accounted for if Lateral Node Merger fails to apply in these cases, thus allowing /r/-dissimilation to apply, yielding the =al= variant.

Lateral Node Merger does not apply when the /r/ of the root is in the rhyme of the first syllable, e.g. /pareka/, /p = al = areka/, since the structural description of the rule is not met. I believe that this relates to a more general constraint whereby sequences of two /r/’s within a syllable are disallowed in Sundanese. Finally, Lateral Node Merger does not apply if the /r/ of the root appears in the second syllable as part of a complex onset, e.g. /motret/, /m = al = o tre t/. This suggests that there is something special about the structure of these complex onsets, though I do not have a formal mechanism to propose to block the application of Lateral Node Merger in these cases. We conclude that the interaction of Lateral Node Merger and /r/-dissimilation accounts for the observed pattern of allomorphy of the plural marker when an /r/ is present in the root (as summarised in (9)).

Finally, consider the case where the =al= allomorph appears in /l/-initial roots, e.g. /litik/, /l = al = itik/. These forms were accounted for with the proposed rule of Lateral Assimilation, in (10). The derivational outcome of the rule of Lateral Assimilation is parallel to the tendency to avoid sequences of two unlike liquids in the onsets of the two initial syllables of a word (*/* [zilateral] V [−zilateral] V.../) discussed above for both /r/- and /l/-initial roots. The structure and output of Lateral Assimilation look suspiciously similar to the rule of Lateral Node Merger, except that the lateral specifications are opposite. This raises the possibility that Lateral Assimilation and the parallel constraint on underlying forms could be accounted for with a more general statement of Lateral Node Merger, involving any two lateral specifications, whether the same or the opposite. Two observations argue against such a generalised rule. First, the underlying constraint on */# [zilateral] V [−zilateral] V.../ sequences is less systematic than that observed for forms with two /r/’s. Second, the =al= variant of the plural marker appears with /l/-initial roots, but not for roots where /l/ appears as the onset of the second syllable, e.g. /gilis/, /garilis/, not */galilis/. The environment of Lateral Assimilation is more limited than the environment of Lateral Node Merger. Thus, although the parallel is interesting, these differences argue that we need to maintain both Lateral Assimilation and Lateral Node Merger as distinct rules.¹⁴
In summary, assuming a rule of Lateral Node Merger, we see that the patterns of allomorphy observed in the plural marker are as expected, if the OCP holds both underlyingly and derivationally in Sundanese. These results lend strong support to the view that rules of dissimilation are motivated by the OCP.

5 Conclusions

We have examined in some detail the formal properties of the plural marker =ar= of Sundanese. We have considered both its behaviour as an infix and the allomorphic alternation between the =ar= and =al= variants. The unusual property of the plural marker, whereby it appears as both an infix and a prefix, results in maximising preferred syllable types. The allomorphy of the plural marker involves both assimilation and dissimilation, accounted for in the proposed analysis by three rules: /r/-dissimilation, Lateral Node Merger and Lateral Assimilation. The facts of Sundanese are compatible with the current view of dissimilation as delinking and subsequent feature fill-in. Yet Sundanese provides strong evidence that dissimilation does not always result in less marked segments, as had been previously suggested. Furthermore the case of Sundanese lends further support in favour of Contrastive Underspecification, rather than Radical Underspecification. Finally, examination of the general phonological patterns of Sundanese reveals that Sundanese offers clear support for the view that dissimilation is an OCP-driven process, in that both the rule of /r/-dissimilation and more general phonotactic patterns behave alike.

NOTES

[1] Although the infix is typically referred to as a plural marker, Ewing (1991) has shown that the formative actually creates distributive forms. I will nevertheless continue to refer to it as a plural marker. The reader is referred there for discussion of both the semantics and pragmatics of such forms.

[2] This process has also been briefly described in the literature on Sundanese (see Eringa 1949, Robins 1959 and Van Syoc 1959).

[3] Root-initial consonant clusters are very rare and I have yet to find such a root from which a plural form can be constructed.

[4] I understand the use of /t/ here to be the same as plan. As discussed by McCarthy (1989).

[5] See also Anderson (1991) for a similar criticism of McCarthy & Prince's view of infixation.

REFERENCES

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[6] A somewhat different approach is taken by Anderson (1972) and Moorevetic (1977). They propose that the infixed of Sundanese are only infixes on the surface; they are underlyingly prefixes which are metathesised via a reordering rule. I believe that an account which correctly locates the affix at the time of affixation is to be preferred.


[8] The patterns exemplified here are very robust, but a few counterexamples occur. In particular, in the case where O or O_i is an /r/, a couple of instances of */ːəl=*

[9] /l/ and /r/ also differ in their specifications for [continuant] (see Cohn 1990). I assume that appropriate [continuant] specifications result automatically from a change in specification for the feature [lateral].

[10] Steriade does not provide explicit derivations of dissimilation in Latin, but her discussion is consistent with the view of dissimilation presented here.

[11] Archangeli (1988) argues that, although the above facts constitute a convincing argument, other arguments suggest the opposite conclusion. The reader is referred here for consideration of these other arguments.

[12] An anonymous reviewer wonders whether para has */ːəl=/ infixed in it. Although historically */ːəl=/ may be etymologically related to para, there is no synchronic connection. /*ːəl/ is not an occurring form and para is clearly monomorphemic.

[13] I use the term phonological copy to refer to a sequence of phonological material that is the same as another sequence. I do not mean to imply that these sequences are phonologically derived through a process of copying. I use the term to distinguish them from the results of the morphological process of reduplication. The former may or may not be due to the latter. Morphologically, partial reduplication of an initial syllable occurs in Sundanese, serving a number of functions. Although a few of the cases of phonological copy result from such partial reduplication, most of them do not; rather they are monomorphemic.

[14] Anderson (1991) suggests that the */ːəl=/ allomorph in /l/ initial roots is not a general phonological rule of Sundanese, but specific to the plural marker. This is difficult to determine, as no other morphological contexts create a comparable phonological context. However, restrictions on the distribution of two or more */ːəl=/’s morpheme-internally are similar to those observed for */r/’s. This suggests that Lateral Assimilation is the derivational parallel to an underlying constraint on */ːər/ sequences, in much the same way that */ːəl=/ -dissimilation parallels a constraint on */ːr/ sequences.

REFERENCES


1 Introduction

This paper argues for a paradigm that generates diminutive (or augmentative) form preceding diminutives (or augmentatives). It also maps the absolutive and accusative cases in a constraint on surfaces with right-proximal prepositions. The analysis is based on a comparison between 'corona' and 'mama' as examples of obligatory contour. The explanation is given with the help of two examples: 'corona' and 'mama'.

A close examination of the examples shows that the surface case is the account of all the main patterns in constructions. Each of the forms matches the following structure:

(1) stem
    a. la čarnaka
    b. la korona
    c. el pan
    d. la madre
    e. la komadre
    f. el menu
    g. el pye
    h. el dinosawyr