Multiple Feature Mutation in Papuanesia
A typological survey

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Mutation in Papuanesia shows the same tendencies that we see in segmental affixes.
Outline

Introduction: What is Multiple Feature Mutation?

Method: Sample & Database

Results

Discussion: Mutation resembles Affixation

Conclusion
Introduction: What is Multiple Feature Mutation?
Report the results of a survey on multiple feature mutation (MFM) in Papuanesia.

Results show similarities to segmental affixation in several properties.

Potential argument for an item-based approach to morphology.
Introduction

Terminology I: Mutation

▶ Multiple feature mutation is a kind of mutation.

**Mutation**

Two word forms are related via mutation, if

- a. one form is morphologically derived from the other and
- b. there is a difference in some segmental feature for some stem segment and
- c. this difference cannot be explained as the regular application of a phonological process.

(1) Schematized Segmental Mutation

$$\Sigma \xrightarrow{\text{seg. diff.}} \Sigma' \xrightarrow{\text{morph. der.}} \text{(Aff)}$$
Introduction

Terminology II: Not Mutation

- Tonal changes and length manipulation are excluded.
- Mutation is different from suppletive allomorphy, because the remaining part of the stem is kept constant and it applies regularly to a set of stems.
- Mutation is different from substitution because it yields different results for different targets.
Introduction

Terminology III: Papuanesia

- Papuanesia includes Insular South East Asia as well as the island of Papua and Oceania (excluding Australia).
- Based on the six macro-areas from Hammarström & Donohue (2014) with the goal to establish a small number of areas with less interaction between the areas than inside them.

Figure 1: Linguistic macro-areas of the world (Hammarström & Donohue, 2014)
Method
Method

Database

- Part of the MAMPF database (Gleim et al., 2019).
- 75 mutation patterns in Papuanesia.
- 46 segmental MFM patterns in Papuanesia from 31 languages.
Method
Genealogical affiliation

- All languages with MFM included, not controlled for genealogical affiliation.

(2) Genealogical affiliation of languages in the sample

<table>
<thead>
<tr>
<th>Genus Category</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceanic</td>
<td>15</td>
<td>48.4%</td>
</tr>
<tr>
<td>Non-Oceanic Austronesian</td>
<td>11</td>
<td>35.5%</td>
</tr>
<tr>
<td>Non-Austronesian</td>
<td>5</td>
<td>16.1%</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Method
Geographical distribution

- Restricted to languages from Papuanesia.

Figure 2: Geographical distribution of the 31 languages surveyed (Oceanic=blue, Other Austronesian=orange, Non-Austronesian=white) © OpenStreetMap contributors
## Method

### Surveyed Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target</td>
<td>Consonant, Vowel</td>
</tr>
<tr>
<td>Edge</td>
<td>Left, Right, n.a.</td>
</tr>
<tr>
<td>Lexical Category</td>
<td>Noun, Verb, Noun&amp;Verb, other</td>
</tr>
<tr>
<td>Segmental material present</td>
<td>yes, no</td>
</tr>
</tbody>
</table>
Method
Examples: Edge I

▶ **Left** edge vowel mutation on nouns with segmental material

(4) Chamorro (Austronesian, GU, MP) (Kaplan, 2008, 1)

a. nána
   mother
   ‘mother’

b. i nána
   the mother
   ‘the mother’

c. gúma?
   house
   ‘house’

d. i gúma?
   the house
   ‘the house’
Method

Examples: Edge II

Right edge vowel mutation on nouns with segmental material

(5) Komnzo (Morehead-Wasur, PNG) (Döhler, 2016, 85)

a. kar-fo
   village-ABL
   ‘to the village’

b. kar-fø-wæ
   village-ABL-EMPH
   ‘really towards the village’

c. nima
   like.this
   ‘this way’

d. nimæ-wæ
   like.this-EMPH
   ‘really like this’
Other vowel mutation on nouns with segmental material

(6) Nimboran (Nimboranic, ID) (Anceaux, 1965, 186)

a. ŋgedúo-man-t-ãm
draw.SG-INCL.DU.S-PRS-INCL
‘You (sg) and I draw here.’

b. ŋgedúo-te-men-t-ím
draw.SG-DUR-INCL.DU.S-PRS-INCL
‘You (sg) and I are drawing here.’
Method

Examples: Target

▶ Right edge **consonant** mutation on verbs with segmental material

(7) Pitu Ulunna Salu (Austronesian, ID) (Campbell, 1991, 19-23)

a. maʔ-túlaʔ
   STAT-speak
   ‘to speak’

b. ki-tulás-am
   1DU.EXCL-speak-APPL
   ‘We tell (him).’

c. um-petuak
   TR-view
   ‘to watch’

d. pa-petuas-am
   CAUS-view-NMLZR
   ‘a view’
Method
Examples: Segmental Material

- Left edge consonant mutation on verbs **without** segmental material

(8) Maskelynes (Oceanic, VU) (Healy, 2013, 149-151)

a. \text{ti(ti)-i}
   twist-OBJ
   ‘to twist something’

b. \text{n\text{di}(\text{n\text{di})}}
   twist\text{\backslash AMBITR}
   ‘twist’

c. \text{xaru\text{\text{\beta^w}}-i}
   scratch-OBJ
   ‘to scratch something’

d. \text{karu\text{\text{\beta^w}}}
   scratch\text{\backslash AMBITR}
   ‘scratch’
Results
Vowels mutation is slightly more frequent than consonant mutation.

Might be unexpected if Nasal substitution (Blust, 2004) and Nasal/Oral alternations (Lynch, 1975) were expected to account for most of the data.

(9) Consonant and Vowel Targets in MFM

<table>
<thead>
<tr>
<th>Target</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consonant</td>
<td>20</td>
<td>43.5%</td>
</tr>
<tr>
<td>Vowel</td>
<td>26</td>
<td>56.5%</td>
</tr>
</tbody>
</table>
MFM occurs more often at the left edge. This mirrors the exceptionality of Papuanesia from the global suffixation trend.

(10) **Mutation Edge in Papuanesia**

<table>
<thead>
<tr>
<th>Edge</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>27</td>
<td>58.7%</td>
</tr>
<tr>
<td>Right</td>
<td>17</td>
<td>37.0%</td>
</tr>
<tr>
<td>n.a.</td>
<td>2</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

(11) **Affixation Edge in Papuanesia and the world (Dryer, 2013b)**

<table>
<thead>
<tr>
<th>Edge</th>
<th>Papuanesia</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Left</td>
<td>39</td>
<td>19.2%</td>
</tr>
<tr>
<td>Right</td>
<td>67</td>
<td>37.0%</td>
</tr>
<tr>
<td>other</td>
<td>86</td>
<td>42.3%</td>
</tr>
</tbody>
</table>
Results

Lexical Category

- MFM occurs more often on verbs.
- Fits the relative rarity of case and plural marking in Papuanesia (Nichols & Bickel, 2013; Dryer, 2013a; Haspelmath, 2013).
- Additionally, TAM marking is rather frequent (Dahl & Velupillai, 2013a,b,c; van der Auwera & Ammann, 2013b,a)

(12) Lexical Category of Mutation in Papuanesia

<table>
<thead>
<tr>
<th>Lex. Cat.</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun</td>
<td>12</td>
<td>26.1%</td>
</tr>
<tr>
<td>Verb</td>
<td>30</td>
<td>65.2%</td>
</tr>
<tr>
<td>Noun&amp;Verb</td>
<td>3</td>
<td>6.5%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2.2%</td>
</tr>
</tbody>
</table>
Results
Segmental material present

- Roughly two thirds of MFM with segmental material present.
- Still one third ‘pure’ mutation.
- Surprising because previous work found non-concatenative morphology to be rare in this area (Bickel & Nichols, 2013).

(13) Presence of segmental material in MFM

<table>
<thead>
<tr>
<th>Segmental material</th>
<th>number</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>17</td>
<td>37.0%</td>
</tr>
<tr>
<td>Yes</td>
<td>29</td>
<td>63.0%</td>
</tr>
</tbody>
</table>
Not all features are completely independent.\(^1\)
General dispreference for right edge consonant mutation.
Vowel mutation without segmental material is rare.
Mutation without segmental material at the right edge is rare.

\(^1\)In this section, I report results of \(\chi^2\) tests. However, the data points are not completely independent, because they can include several patterns from the same language. The results should therefore be taken with a grain of salt.
Results

Interaction: Edge × Target

- General dispreference for right edge consonant mutation.
- Can be related to syllable structure.
- Word-initially consonants are more frequent than vowels.
- Word finally, vowels are more frequent.

(14) Universal tendency for left-edge consonant mutation
There are more pattern of left-edge consonant mutation than there are right edge consonant mutations.

(15) Target and Edge ($\chi^2=17.31, p=0.000032$)

<table>
<thead>
<tr>
<th>Edge\Target</th>
<th>Consonant</th>
<th>Vowel</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>19</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td>Right</td>
<td>1</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Sum</td>
<td>20</td>
<td>26</td>
<td>46</td>
</tr>
</tbody>
</table>
Results

Interaction: Segmental Material $\times$ Target

- Only one case of vowel mutation without segmental material present.
- Surprising and unclear what conditions this correlation.

(16) Segmental material and Target ($\chi^2=28.1383$, $p<.00001.$)

<table>
<thead>
<tr>
<th>Segmental material $\backslash$ Target</th>
<th>C</th>
<th>V</th>
<th>sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>4</td>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>sum</td>
<td>20</td>
<td>26</td>
<td>46</td>
</tr>
</tbody>
</table>
Results
Interaction: Segmental Material $\times$ Edge

- Only one case of right edge mutation without material present.
- Surprising and unclear what conditions this correlation.

\[(17)\] Edge and Segmental material ($\chi^2 = 12.536$, $p = 0.000399$)

<table>
<thead>
<tr>
<th>Segmental material $\backslash$ Edge</th>
<th>Left</th>
<th>Right</th>
<th>sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>11</td>
<td>16</td>
<td>27</td>
</tr>
<tr>
<td>No</td>
<td>16</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>sum</td>
<td>27</td>
<td>17</td>
<td>44</td>
</tr>
</tbody>
</table>
Discussion
The dispreference for right edge mutation mirrors the absence of a strong suffixation preference in Papuanesia.

Similarly to segmental morphology, mutation tends to occur in the verbal domain.

Potential argument for treating mutation and affixation the same, e.g. strictly item based approaches or strictly construction based approaches.
Discussion

Left Edge Consonant mutation

- Consonant mutation shows a strong preference for the left edge.
- This can be explained with universal phonotactic preferences for CV syllables.
- Words more frequently have consonants in initial position than in final position.
- Tendency is expected to hold for all macro-areas.
Tendencies against right edge mutation without segmental material present and against vowel mutation without segmental material remain unexplained so far.

No possible explanation by comparison to affixation, since presence of segmental material is a variable.

For the same reason, no possible explanation from phonotactics.
Conclusion
Multiple Feature mutation resembles segmental morphology in edge orientation (left) and lexical category (verb).

A strong bias against consonant mutation can be explained by phonotactic tendencies.

Correlations of segmental material with target and edge remain a puzzle.


