Multiple Feature Mutation in Papuanesia
A typological survey

Sören E. Tebay (tebay@uni-leipzig.de), Universität Leipzig

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Main Claim

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

1 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.

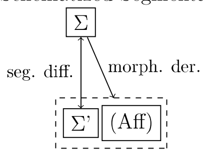
Terminology I: Mutation

- 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



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.

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.

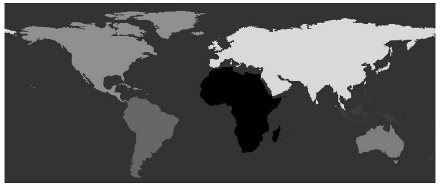


Figure 1: Linguistic macro-areas of the world (Hammarström & Donohue, 2014)

2 Method: Sample & Database

Database

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

Genealogical affiliation

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

(2) Genealogical affiliation of languages in the sample

Genus Category	number	percentage
Oceanic	15	48,4%
Non-Oceanic Austronesian	11	35,5%
Non-Austronesian	5	16,1%
Total	31	100,0%

Geographical distibution

- Restricted to languages from Papuanesia.

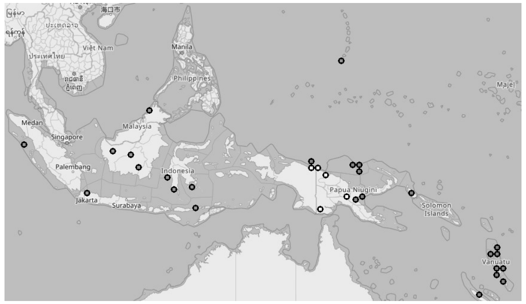


Figure 2: Geographical distibution of the 31 languages surveyed (Oceanic=blue, Other Austronesian=orange, Non-Austronesian=white) © OpenStreetMap contributors

Surveyed Properties

(3) Surveyed Properties

Properties	values
Target	Consonant, Vowel
Edge	Left, Right, n.a.
Lexical Category	Noun, Verb, Noun&Verb, other
Segmental material present	yes, no

Examples: Edge

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

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

a. nána
mother
'mother'

b. i næ̃na
the mother
'the mother'

c. gúmaʔ
house
'house'

d. i gímaʔ
the house
'the house'

- **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-ám
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.'

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'

Examples: Segmental Material

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

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

a. ti(ti)-i
twist-OBJ
'to twist something'

b. ⁿdi(ⁿdi)
twist\AMBITR
'twist'

c. xaruβʷ-i
scratch-OBJ
'to scratch something'

d. karuβ^w
scratch\AMBITR
'scratch'

3 Results

Target

- 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

Target	#	%
Consonant	20	43.5%
Vowel	26	56.5%

Mutation Edge

- MFM occurs more often at the left edge.

↪ mirrors exceptionality of Papuanesia from the global suffixation trend.

(10) Mutation Edge in Papuanesia

Edge	#	%
Left	27	58.7%
Right	17	37.0%
n.a.	2	4.3%

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

	Papuanesia		World	
Edge	#	%	#	%
Left	39	19.2%	152	15.7%
Right	67	37.0%	529	54.6%
other	86	42.3%	288	29.7%

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

Lex. Cat.	#	%
Noun	12	26.1%
Verb	30	65.2%
Noun&Verb	3	6.5%
Other	1	2.2%

Segmental material present

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

(13) Presence of segmental material in MFM

Segmental material	number	percentage
No	17	37.0%
Yes	29	63.0%

Interaction

- 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.

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 (χ^2=17.31,p=0.000032)

Edge\Target	Consonant	Vowel	Sum
Left	19	9	28
Right	1	17	18
Sum	20	26	46

Interaction: Segmental Material × Target

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

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

Segmental material\Target	C	V	sum
Yes	4	25	29
No	16	1	17
sum	20	26	46

[1] In this section, I report results of χ^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.

Interaction: Segmental Material × Edge

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

(17) Edge and Segmental material (χ^2=12.536, p=0.000399)

Segmental material\Edge	Left	Right	sum
Yes	11	16	27
No	16	1	17
sum	27	17	44

4 Discussion: Mutation resembles Affixation

- 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.

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.

Puzzles

- 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.

5 Conclusion

- Multiple Feature mutation resembles segmental morphology in edge orientation (left) and lexical category (verb).
- A strong bias against consonant mutation can be exaplained by phonotactic tendencies.
- Correlations of segmental material with target and edge remain a puzzle.

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A Surveyed languages, patterns and sources

Table 1: Languages surveyed in the typological study

Name	Affil-1	Glott	ISO 639.3	Wals Genus
Banoni	Austronesian	bann1247	bcm	Oceanic
West Coast Bajau	Austronesian	west2560	bdr	Sama-Bajaw
Paluai	Austronesian	balu1257	blq	Oceanic
Cemuhi	Austronesian	cemu1238	cam	Oceanic
Chamorro	Austronesian	cham1312	cha	Chamorro
Sye	Austronesian	siee1239	erg	Oceanic
Hote	Austronesian	hote1245	hot	Oceanic
Indonesian	Austronesian	cjin1234	ind	Malayo-Sumbawan
Jabêm	Austronesian	yabe1254	jae	Oceanic
Maskelynes	Austronesian	mask1242	klv	Oceanic
Lele	Austronesian	lele1270	lle	Oceanic
Raga	Austronesian	hano1246	lml	Oceanic
Lamen	Austronesian	lame1260	lmu	Oceanic
Lamaholot	Austronesian	lewo1244	lwt	Central Malayo-Polynesian
Lewo	Austronesian	lewo1242	lww	Oceanic
Makassarese	Austronesian	maka1311	mak	South Sulawesi
Maanyan	Austronesian	maan1238	mhy	Barito
Muna	Austronesian	muna1247	mnb	Celebic
Vurës	Austronesian	vure1239	msn	Oceanic
Mualang	Austronesian	mual1241	mtd	Malayo-Sumbawan
Nias	Austronesian	nias1242	nia	NW Sumatra-Barrier Islands
Nimboran	Nimboranic	nucl1633	nir	Nimboranic
Kadorih	Austronesian	otda1235	otd	Barito
Pitu Ulunna Salu	Austronesian	bamb1270	ptu	South Sulawesi
Kele	Austronesian	kele1258	sbc	Oceanic
Sakao	Austronesian	saka1289	sku	Oceanic
Komnzo	Morehead-Wasur	wara1294	tci	Morehead-Wasur
Tobati	Austronesian	toba1266	tti	Oceanic
Wutung	Sko	wutu1244	wut	Western Skou
Yeri	Nuclear Toricelli	yapu1240	yev	Wapei-Palei
Hua	Nuclear TNG	yaga1260	ygr	Eastern Highlands

Table 2: Patterns surveyed in the typological study

Id	Seg	Lex	Targ	Loc	Mult?
bcm1	Y	V	V	RM	collateral
bdr1	N	N, V	C	Ini	collateral
blq1	Y	N	V	RM	phonologically conditioned
cam1	N	N	C	Ini	collateral
cha1	Y	N	V	LM	collateral
cha2	Y	N	V	LM	collateral
cha3	Y	N	V	LM	collateral
erg1	Y	V	C	LM	straight
erg2	Y	V	V	Ini	straight
hot1	N	V	C	LM	collateral, phonologically conditioned
ind1	N	V	C	LM	collateral
jae1	Y	N	V	RM	collateral
jae2	Y	N	V	RM	collateral
klv1	Y	V	C	Ini	phonologically conditioned
lle1	Y	V	V	LM	collateral
lle2	Y	N	V	RM stem	collateral
lml1	N	V	C	Ini	straight
lmu1	N	V	C	Ini	collateral
lwt1	N	V	C	Ini	collateral
lww1	N	V	C	LM	collateral
mak1	Y	N, V	C	Ini	collateral, straight
mhy1	N	V	C	Ini	collateral
mnb1	Y	V	C	Ini	collateral
msn2	Y	N	V	RM	phonologically conditioned
mtd1	N	V	C	Ini	collateral
nia1	N	N	C	LM	phonologically conditioned
nir1	Y	V	V	All	straight
nir2	Y	V	V	RM	straight
nir3	Y	V	V	All	straight
nir4	Y	V	V	RM	straight
otd1	N	N, V	C	Ini	collateral
ptu2	N	V	C	Fin	collateral
sbc1	Y	Classfiers	V	LM	collateral
sbc2	Y	V	V	LM	collateral
sku1	Y	N	V	Fin	phonologically conditioned
tci1	Y	N	V	Fin	phonologically conditioned
tti1	N	V	C	Ini	collateral
wut1	N	V	C	Ini	phonologically conditioned
wut2	N	V	C	Ini	phonologically conditioned
yev1	Y	V	V	RM	collateral
yev2	N	V	V	LM	lexically conditioned
ygr1	Y	V	V	RM	collateral
ygr2	Y	V	V	RM	collateral
ygr3	Y	V	V	RM	collateral
ygr4	Y	V	V	RM	collateral
ygr5	Y	V	V	RM	collateral

Table 3: Sources used in the typological study

Id	Source
bcm1	Lynch et al. (2002, 447)
bdr1	Miller (2006, 240)
blq1	Schokkin (2014, 197)
cam1	Lynch et al. (2002, 756)
cha1	Kaplan (2008)
cha2	Kaplan (2008)
cha3	Kaplan (2008)
erg1	Crowley (1998)
erg2	Crowley (1998)
hot1	Muzzey (1979, 30)
ind1	Sneddon (2006, 20-23)
jae1	Lynch et al. (2002, 273)
jae2	Lynch et al. (2002, 273)
klv1	Healy (2013, 249–250)
lle1	Boettger (2015, 49)
lle2	Boettger (2015, 44)
lml1	Lynch et al. (2002, 632)
lmu1	Lynch et al. (2002, 676)
lwt1	Nagaya (2012, 125–127)
lww1	Early (1994, 151-170)
mak1	Jukes (2006, 94)
mhy1	Gudai (1985, 76)
mnb1	van den Berg (1989, 35)
msn2	Malau (2016, 281)
mtd1	Tjia (2007, 40–42)
nia1	Brown (2001, 69,342–366)
nir1	Inkelas (1993)
nir2	Inkelas (1993)
nir3	Inkelas (1993)
nir4	Inkelas (1993)
otd1	Inagaki (2006, 44)
ptu2	Campbell (1991, 23)
sbc1	Lynch et al. (2002, 129–131)
sbc2	Lynch et al. (2002, 136)
sku1	Lynch et al. (2002, 603)
tci1	Döhler (2016, 85)
tti1	Lynch et al. (2002, 194)
wut1	Marmion (2010, 297)
wut2	Marmion (2010, 297)
yev1	Wilson (2017, 362–368)
yev2	Wilson (2017, 371–375)
ygr1	Haiman (1980, 47–80)
ygr2	Haiman (1980, 47–80)
ygr3	Haiman (1980, 47–80)
ygr4	Haiman (1980, 47–80)
ygr5	Haiman (1980, 47–80)