Malagasy OCP targets a single affix:
implications for morphosyntactic generalization in learning[*]

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Investigators have uncovered evidence for phonological LEARNING BIASES: biases inherent in learners that favor certain language phonologies over others (Wilson 2006, Finley 2012, Moreton & Pater 2012, Hayes & White 2013, White 2014, McMullin & Hansson 2014, *a.o.*). To what extent can a learning bias be defied in language? This question bears directly on the theory of phonological learning, as it addresses the limits of learner capability.

A growing family of findings suggests that learners tend to favor phonological constraints that are morphosyntactically general—i.e., obeyed by at least several morphemes, or in multiple or all grammatical contexts. That phonological alternations are typically corroborated by the phonotactics of a given language was observed as early as Chomsky & Halle (1968) and Kenstowicz & Kisseberth (1977), but the generalizing tendency just mentioned has also been observed in a number of recent corpus studies: Martin (2007, 2011), Zuraw (2015), Breiss & Hayes (2018), and Shih & Zuraw (2018) observe cases of grammatical "leaking", in which strong phonotactic restrictions tend to manifest across word boundaries or compound boundaries, or affect the choice between grammatical constructions. Chong (2017) found that certain alternations purported to be apparent derived environment effects are just that—merely apparent. For example, though Korean *t*-palatalization triggered by high front vocoids was previously proposed

to constitute a derived environment effect due to there existing *ti*-sequences in some roots, Chong showed that such sequences are highly underattested in the Korean lexicon. Generalization effects were also borne out in artificial language learning experiments: Myers & Padgett (2014) found that participants generalize a phrase-final devoicing pattern to the word-final domain without exposure to unambiguous evidence; Chong (2017) found that participants more readily learned a suffixal harmony alternation when they were exposed to higher rates of root harmony, corroborating proposals that phonotactic generalizations assist in acquiring alternations (Tesar & Prince 2003, Hayes 2004, Jarosz 2006, *a.o.*).

In light of these findings, Martin (2011) and Chong (2017) propose learning models whereby whenever the learner weights positively a structure-specific constraint (e.g., applying only across a suffix boundary), it gives positive weight to an analogous structure-insensitive constraint, leading to the generalizing tendency. If there were to exist an alternation that applies consistently in a constrained morphosyntactic context without even an analogous *statistical tendency* in phonotactics to accompany it, then that would complicate our understanding of learners' preference for morphosyntactically general patterns, as it would suggest that wholly structure-specific alternations could be learned.

This squib presents one such alternation. Malagasy displays backness dissimilation, an alternation that has persisted across multiple generations that sends a back vowel to front in the presence of a nearby back vowel. The process applies very consistently to the passive imperative suffix, *–u,* and is blocked by intervening front vowels—a behavior

typical of dissimilation—suggesting the working of an OCP constraint. But –*u* is the only affix in the language that undergoes dissimilation, and is the only suffix even eligible to undergo it. Stems in the lexicon, moreover, show no preference for dissimilation whatsoever; they in fact display a modest but highly significant opposing preference for harmony. This suggests that Malagasy learners induce a morphologically specific OCP constraint—specific either to –*u* alone or to the suffix domain as a whole—without the need for a corroborating phonotactic trend. These findings suggest that *no* degree of morphosyntactic generality is a *necessary* condition for learning. Though learners might be biased towards acquiring grammatically general constraints, the Malagasy system suggests that they are capable of overriding it. I present this system below, and discuss the problems it poses for a theory in which learners favor grammatically general constraints.

1. Backness dissimilation applying to the passive imperative suffix

Unless otherwise specified, the data below come from the Malagasy Dictionary and Encyclopedia of Madagascar (hereafter MDEM; malagasyword.org; de la Beaujardière 2004), an annotated online corpus containing ~92,000 Malagasy words. The Malagasy vowel inventory is composed of [i e a u] (Parker 1883, de la Beaujardière 2004). There are four suffixes: the passive suffixes –*ina* and –*ana*, the active imperative suffix –*a*, and the passive imperative suffix –*u* (Parker 1883, Richardson 1885).[1]

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[1] MDEM specifies that –*u* can also attach to verbs to form relative imperatives, in addition to passive imperatives. I nevertheless follow Parker (1883), Manaster-Ramer (1995), *inter alia* in calling it a passive imperative suffix.

The passive imperative suffix conditionally undergoes backness dissimilation (Parker 1883, Zymet 2015): underlying *–u* (1a-b) surfaces as *–i* after stems containing *u* (2a-d) unless a front vowel intervenes (3a-b). The alternation conforms to patterns driven by the Obligatory Contour Principle (Leben 1973, Goldsmith 1976, *et seq*).

Underlying –u	(1a)	/bata+u/	[bata-u]	lift-PASS.IMP
	(1b)	/sava+u/	[sava-u]	inspect-PASS.IMP
Backness dissimilation	(2a)	/bab**u**+**u**/	[bab**u**-**i**]	plunder-PASS.IMP
	(2b)	/t**u**v+**u**/	[t**u**v-**i**]	fulfill-PASS.IMP
	(2c)	/s**u**av+**u**/	[s**u**av-**i**]	bless-PASS.IMP
	(2d)	/**u**^{n}dan+**u**/	[**u**^{n}dan-**i**]	bolster-PASS.IMP
Blocking by front vowels	(3a)	/t**u**ri+**u**/	[t**u**ri-**u**]	preach-PASS.IMP
	(3b)	/f**u**les+**u**/	[f**u**les-**u**]	thread-PASS.IMP

5,035 words in MDEM with the passive imperative suffix were extracted. The counts in Table 1 show that dissimilation is triggered by the presence of stem-internal *u*, applies regularly when the trigger is local and semi-regularly across *a*, and is regularly blocked by front vowels.

Context (ignoring consonants)	*–u*	*–i*	**Dissim. rate**	**Example**
No trigger	2649	8	0.0%	bata-u
Adjacent trigger	6	1365	99.6%	bab**u-i**
Intervening *a*	272	245	47.3%	tuda-**i**
Intervening front vowel	485	5	0.1%	t**u**ri-**u**

Table 1: *Counts for Malagasy backness dissimilation*

Multiple lines of evidence suggest that Malagasy speakers acquire this alternation. For one, the process applies very consistently, and in particular *essentially categorically* in the local case: the *–u* allomorph of the suffix surfaces after nearly all of the 1,884

stems that lack *u*, while the *–i* allomorph surfaces after nearly all of the 993 stems whose last vowel is *u*. Moreover, dissimilation is observed across at least two generations: it was reported as early as Parker (1883), and evidence for it appears in dictionaries since then (e.g., Abinal & Malzac 1888, Rajemisa 1985, de la Beaujardière 2004).

To further assess whether speakers extended the pattern to novel contexts, I conducted a study to determine whether dissimilation and its blocking is observed even when *–u* comes after loaned stems occurring in MDEM, as in (4a-d) below. Stems marked with (W) are indicated to be loans in the World Loanword Database (wold.clld.org; Adelaar 2009b); stems marked with (A) are indicated to be loans in Adelaar (2009a); stems marked with (Bl) are indicated to be loans in Blench (2008); and the rest are indicated to be loans in MDEM itself. The study uncovered fourteen loaned stems whose last vowel is *u*; even in these stems, we observe *categorical* dissimilation when the closest vowel to the suffix is a trigger, reflecting the pattern observed across the corpus. The study uncovered five stems whose second-to-last vowel is *u,* and whose last vowel is *a.* These words, on the whole, vary in whether they undergo dissimilation, and therefore also reflect the corpus pattern. Finally, the study uncovered five stems with a triggering *u* being separated from the suffix by front vowel(s); across all cases, we observe categorical blocking, again following the corpus pattern. These data suggest that speakers consistently extended the dissimilatory patterns observed in the corpus when they encountered eligible novel words. Below I provide some examples—for the full set of loanwords, see the Appendix.

					Loaned from
Categorical	(4a)	/aᵐpuᵐbu+u/	[aᵐpuᵐb**u-i**]	husk-PASS.IMP	Bantu (Bl)
Local	(4b)	/kiraru+u/	[kirar**u-i**]	shoe-PASS.IMP	Bantu (W)
Dissimilation	(4c)	/matsu+u/	[mats**u-i**]	march-PASS.IMP	English
	(4d)	/purufu+u/	[puruf**u-i**]	proof-PASS.IMP	English
	(4e)	/ikisukisu+u/	[ikisukis**u-i**]	pig call-PASS.IMP	French (W)
	(4f)	/paiⁿgur+u/	[paiⁿg**u**r-**i**]	hairpin-PASS.IMP	French
Variable	(4g)	/aᵐbuaz+u/	[aᵐb**u**az-**i**]	dog-PASS.IMP	Bantu
Nonlocal	(4h)	/ipataluha+u/	[ipatal**u**ha-(**u~i**)]	pants-PASS.IMP	French
Dissimilation	(4i)	/kuᵐpa+u/	[k**u**ᵐpa-**u**]	compass-PASS.IMP	French
Blocking	(4j)	/burusi+u/	[bur**u**si-**u**]	brush-PASS.IMP	French
	(4k)	/turusi+u/	[tur**u**si-**u**]	gauge-PASS.IMP	French
	(4l)	/uᵐbi+u/	[**u**ᵐbi-**u**]	ox-PASS.IMP	Bantu (Bl)

Remarkably, it would seem that the passive imperative suffix is the *only* affix to undergo dissimilation, and, assuming the process sends back vowels to front but not vice versa, is the only suffix even eligible to undergo it, as far as I am aware (being the only one to contain *u*). Even if we assume that dissimilation sends back vowels to front *and* vice versa, it is still not displayed by any other affix, according to an MDEM search—see the Appendix for details. If there were other evidence for a dissimilatory tendency in the grammar, we would expect to find it in phonotactics. We now turn to a corpus study of roots to assess whether this is the case.

2. A backness harmony trend in Malagasy stem phonotactics

Surprisingly, roots display a modest but highly significant tendency toward backness *harmony*. MDEM gives numerous harmonic roots:

(5) **k**i**ri** 'small hole' sar**u**t'**u** 'cape' **uzu**na 'curse'
  l**ufu** 'persistence' t**e**v**i**ka 'spasm' tsiⁿd'**i** 'compression'
  g**e**g**i** 'indiscreet' v**ulu** 'color' d**uku** 'identity'

Counts of tier-adjacent pairs involving only front or back vowels (*i*, *e*, and *u*) were enumerated across 4,514 roots that were extracted from MDEM. The counts reveal no preference for disharmonic sequences in roots, as Table 2 reveals below. Note that the majority of roots in the corpus are classified as nouns (2,737), adjectives (729), or adverbs (733); verbs are derived through affixation (*cf.* Keenan & Polinsky 1998).[2]

	# harmonic VC_0V *seq.s*	*# disharmonic* VC_0V *seq.s*	*# harmonic* VC_0aC_0V *seq.s*	*# disharmonic* VC_0aC_0V *seq.s*
Within noun roots	786	602	35	44
Within adj. roots	185	183	27	11
Within adv. roots	312	188	109	49
Within interj., conj., prep. roots	96	41	24	14
TOTAL	**1379**	**1014**	**205**	**118**

Table 2: *Raw counts of (dis/)harmonic sequences in roots*

There are around 350 more local harmonic sequences than local disharmonic sequences, and around 100 more nonlocal harmonic sequences than nonlocal disharmonic sequences. This makes backness dissimilation highly morphologically specific: it requires reference to the suffix domain or to the passive imperative suffix in particular, and lacks a counterpart generalization in stem phonotactics.

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[2] Some words displaying reduplication (*cf.* Lin 2005) were classified as roots in the corpus; in these cases, only the root involved in reduplication contributed to the counts, rather than the reduplicated stem as a whole. A conference reviewer points out that there could exist productive pseudoreduplication, with the first syllable being a copy of the second, potentially inflating the harmony rate. The corpus revealed that only 115 of the 4,514 roots have matching first and second syllables, with only 64 beginning with a front or back vowel ([diditra] = 'twisting', [vuvuka] = 'dust'). It is not at all obvious that the language possesses pseudoreduplication, considering how low the count is here.

In fact, as we will see, Malagasy displays a significant tendency toward backness *harmony* in roots—these counts are unlikely to have arisen by chance alone. The observed rates of local and nonlocal harmony are 1379/(1379 + 1014) = 57.3% and 205/(205+ 108) = 63.5%, respectively. We can calculate the expected local harmony rate given the frequencies of front and back vowels by extracting from roots all V_1V_2 sequences in which each vowel belongs to [i e u], and calculating $[p(V_1 = u) \times p(V_2 = u)]$ + $[p(V_1 = i$ or $e) \times p(V_2 = i$ or $e)]$, where e.g. $p(V_1 = u)$ is the number of instances of *u* in V_1 position divided by the number of instances of *i*, *e*, and *u* in V_1 position. The expected rate of nonlocal harmony is computed analogously over V_1aV_2 sequences. Doing this, we obtain 51.6% and 57.7% as expected rates of local and nonlocal harmony. Comparing the observed and expected rates, we find that observed rates (local: 57.3%; nonlocal: 63.5%) are higher than expected (local: 51.6%; nonlocal: 57.7%). To determine whether harmonic sequences occur *significantly* more than chance would predict, we can run a Monte Carlo simulation (Kessler 2001). To run a simulation for local vowel sequences, we gather pairs of tier-adjacent vowels belonging to [i e u], shuffle the second vowels of each pair and randomly concatenate each of them to a first vowel, calculate the new harmony rate, and then repeat 10,000 times. The simulation for nonlocal sequences (V_1aV_2) can be computed analogously. Figures 1a-b below show histograms of (non/)local harmony rate frequencies after the 10,000 trials.
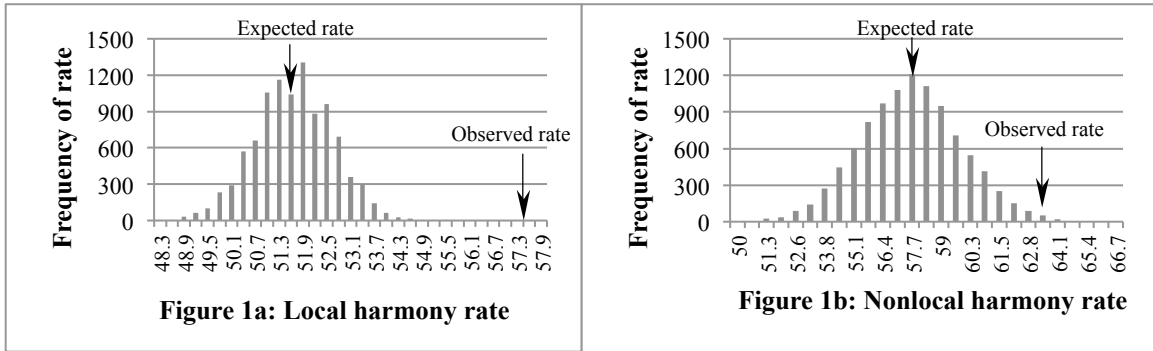
Figures 1a & 1b: *distribution of non/local harmony rates yielded by Monte Carlo trials*

For local harmony, the observed rate of 57.3% is greater than *any rate* yielded by 10,000 trials, and is thus significantly greater than chance would predict (est. $p < \frac{1}{10000} = 0.0001$). For nonlocal harmony, the observed rate of 63.5% is greater than 9,834 of the trials, and is thus significantly above chance as well (est. $p = \frac{10000-9834}{10000} = 0.008$). The results suggest that overrepresentation is not coincidental, but rather reflects a backness harmony preference in phonotactics. Note that there exists some evidence of a harmony alternation as well. The –*in*–/–*un*– infix is used to create passive verbs ([sava] = clear, [s-in-ava] = clear-PASS; [fidi] = choice, [f-in-idi] = choice-PASS). MDEM gives 288 words with –*in*– and 14 with –*un*–. –*in*– can surface before any vowel, and in particular surfaces before *u* in 56 forms. But in the 14 forms with –*un*–, the following vowel is always *u* ([b**u**ri] = round; [b-**u**n-**u**ri] = round-PASS), suggesting that –*un*– is selected to satisfy a (weak) harmony drive.[3] That an infix can harmonize while another suffix dissimilates is reminiscent of Yucatec Maya, in which two suffixes harmonize for backness and height, but another dissimilates for backness, and yet another for backness

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[3] An anonymous reviewer points out that these data suggest that infixes are treated as part of the stem in a way that other affixes are not. It may be that only prefixes, suffixes and other morphemes located at the edge depart from language-wide phonotactics.

and height (Blair 1964; see Krämer 2001 for an account). Altogether, these cases suggest that *contradictory* markedness preferences can target different morphemes or domains.

To summarize, Malagasy backness dissimilation applies consistently to the passive imperative suffix and displays blocking behavior typical of OCP. Roots, however, show no dissimilatory tendency, but rather a modest but highly significant harmony preference.

3. Discussion and potential analytical directions

The Malagasy system complicates the picture of how a morphosyntactic generality bias in phonological learning should be modeled. Martin (2011) finds that phonotactic generalizations can "leak" into the cross-boundary domain: in Navajo sibilant harmony and English geminate avoidance, a categorical generalization within roots is mirrored by a statistical tendency across compound boundaries. Moreover, Chong (2017)'s corpus study of Korean palatalization and Turkish velar deletion, alternations previously purported to constitute derived environment effects, suggests that the effect is merely apparent in that the alternations are either accompanied by a statistically significant phonotactic generalization, or not productive. To account for these facts, Martin and Chong propose learning models that cannot acquire wholly structure-specific principles—in particular, MaxEnt learning systems whereby whenever the learner weights positively a structure-specific constraint (e.g., applying only across a suffix boundary), it gives positive weight to an analogous domain-general constraint, leading over time to generalization across domains. Perhaps a variety of morphophonological frameworks that do not encode a generalizing bias would be able to capture the data (e.g, stratal approaches, indexation-based approaches, or cophonologies); but models that

cannot learn an alternation without phonotactic evidence, or that are biased to generalize the driving force for the alternation across domains, cannot obviously be applied to Malagasy, at least without further elaboration.

Here we briefly speculate upon a few potential solutions to the problem. First, perhaps when the passive imperative suffix was adopted in Malagasy, dissimilation arose to distinguish the suffix boundary (Robert Daland and Keren Rice, p.c.)—a drive that conflicts with the generalizing bias. Another possibility is to say that Malagasy OCP targets the passive imperative suffix *–u* rather than the entire suffix domain, and that in general any particular *morpheme* can depart from typical phonological behavior in a language as long as whole *domains* respect the generality property to some degree. For example, palatalization is a productive alternation in Korean despite there existing roots with [ti]-sequences (Kiparsky 1973, 1993; Iverson & Wheeler 1988); but Chong (2017)'s study shows that such roots are underattested in the language. Korean therefore displays the morphosyntactic generality property for the most part, with only some roots deviating from typical behavior. Of course, we cannot be *certain* that OCP targets the passive imperative exclusively in Malagasy: it may be that OCP scopes over the whole domain, with the one suffix violating it, *–u*, undergoing dissimilation. Alternatively, it could be that a generalizing bias applies even in the Malagasy case, but that Malagasy learners make use of a phonotactic harmony constraint that counteracts leaking of dissimilation into roots (see Zymet 2018 for a MaxEnt model involving this). Backness harmony *and* dissimilation are observed crosslinguistically (Parker 1883, Esztergár 1971, Campbell 1977, Clements & Sezer 1982, Itô 1984, Harrison 1999, *a.o.*) and the two can even apply

to different suffixes in the same language (as in both Malagasy and in Yucatec Maya—see Blair 1964, Krämer 2001).[4] Finally, a reviewer suggests that nonlocal (dis)harmony may inherently require domains, and therefore one might expect that drastic departure from language-wide phonotactics is possible only in such cases. A broader understanding of the typology of nonlocal restrictions—in particular, whether structure-insensitive restrictions exist—should eventually address this possibility.

4. Conclusion

Several findings now suggest that learners tend to favor morphosyntactically general phonological constraints. This squib argues that this bias, if it exists, can be overridden. Malagasy backness dissimilation applies very consistently to the passive imperative suffix *–u*, and displays blocking behavior typical of OCP. But *–u* is the only affix in the grammar that undergoes it, and is the only suffix even eligible to undergo it. Stems, on the other hand, display a modest but significant harmony trend. This suggests that Malagasy learners induce a morphologically specific OCP constraint—specific either to *–u* or to the suffix domain as a whole—without the need for a corroborating phonotactic trend. These findings suggest that *no* degree of morphosyntactic generality is a *necessary* condition for learning. Though learners might favor grammatically general constraints, the Malagasy system suggests that they are capable of overriding this bias.

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[4] A reviewer points out that, if the learner can entertain dissimilation in one domain and harmony in another, then we should find a system in which harmony applies across a boundary, with roots showing a dissimilatory tendency. Whether we find such a system is a question left to future investigation.

Appendix

Given below are Stems marked with (W) are indicated to be loans in the World Loanword Database (wold.clld.org; Adelaar 2009b); stems marked with (A) are indicated to be loans in Adelaar (2009a); stems marked with (Bl) are indicated to be loans in Blench (2008); and the rest are indicated to be loans in MDEM. It is again noted that, even in these stems, we observe *categorical* dissimilation when the closest vowel to the suffix is a trigger, variable—but extant—dissimilation when *a* intervenes, and categorical blocking when a front vowel intervenes, following the corpus-wide patterns illustrated in Table 1. These data suggest that speakers extended the dissimilatory patterns when they encountered eligible novel words.

					Loaned from
Categorical	(6a)	/akaⁿdᶻ**u**+**u**/	[akaⁿdᶻ**u**-**i**]	coat-PASS.IMP	Bantu (W)
Local	(6b)	/aᵐpuᵐb**u**+**u**/	[aᵐpuᵐb**u**-**i**]	husk-PASS.IMP	Bantu (Bl)
Dissimilation	(6c)	/aᵑgan**u**+**u**/	[aᵑgan**u**-**i**]	story-PASS.IMP	Bantu
	(6d)	/bab**u**+**u**/	[bab**u**-**i**]	plunder-PASS.IMP	Bantu
	(6e)	/kirar**u**+**u**/	[kirar**u**-**i**]	shoe-PASS.IMP	Bantu (W)
	(6f)	/kuhukuh**u**+**u**/	[kuhukuh**u**-**i**]	poultry call-PASS.IMP	Bantu (W)
	(6g)	/kulukul**u**+**u**/	[kulukul**u**-**i**]	turkey sound-PASS.IMP	Bantu (Bl)
	(6h)	/aref**u**t+**u**/	[aref**u**t-**i**]	rifle sound-PASS.IMP	English (A)
	(6i)	/mats**u**+**u**/	[mats**u**-**i**]	march-PASS.IMP	English
	(6j)	/pisupis**u**+**u**/	[pisupis**u**-**i**]	puss-PASS.IMP	English
	(6k)	/puruf**u**+**u**/	[puruf**u**-**i**]	proof-PASS.IMP	English
	(6l)	/ibila**u**r+**u**/	[ibila**u**r-**i**]	blot-PASS.IMP	English
	(6m)	/ikisukis**u**+**u**/	[ikisukis**u**-**i**]	pig call-PASS.IMP	French (W)
	(6n)	/paiᵑg**u**r+**u**/	[paiᵑg**u**r-**i**]	hairpin-PASS.IMP	French
Variable	(6o)	/aᵐb**u**az+**u**/	[aᵐb**u**az-**i**]	dog-PASS.IMP	Bantu
Nonlocal	(6p)	/ipatal**u**hav+**u**/	[ipatal**u**hav-**i**]	pants-PASS.IMP	French
Dissimilation	(6q)	/ipatal**u**ha+**u**/	[ipatal**u**ha-(**u~i**)]	pants-PASS.IMP	French
	(6r)	/av**u**na+**u**/	[av**u**na-**u**]	knot-PASS.IMP	Bantu (Bl)
	(6s)	/k**u**ᵐpa+**u**/	[k**u**ᵐpa-**u**]	compass-PASS.IMP	French

Blocking	(6t)	/bur**u**s**i**+**u**/	[bur**u**s**i**-**u**]	brush-PASS.IMP	French		
	(6u)	/tur**u**s**i**+**u**/	[tur**u**s**i**-**u**]	gauge-PASS.IMP	French		
	(6v)	/tab**u**r**i**+**u**/	[tab**u**r**i**-**u**]	round-PASS.IMP	Bantu		
	(6w)	/**u**ᵐb**i**+**u**/	[**u**ᵐb**i**-**u**]	ox-PASS.IMP	Bantu (Bl)		
	(6x)	/p**u**iz**i**n+**u**/	[p**u**iz**i**n-**u**]	poison-PASS.IMP	English		

Given below are all affixes in MDEM occurring with at least 20 stems and that can

place a front/back vowel tier-adjacent to a front/back root vowel. None of them alternate

based on the root vowel (see http://malagasyword.org/bins/derivLists?form#longScroll),

except for *–in–/–un–*, which displays some evidence of a harmony alternation (see

Section 3).

Pref.	**# forms w/ pref.**	**Circumf.**	**# forms w/ circumf.**	**Inf.**	**# forms w/ inf.**	**Suff.**	**# forms w/ suff.**
fi- 'manner of doing X'	2618	fi-…-ana 'instance of X'	2144	-in-/-un- -PASS-	288+14	-ina/-na[5] -PASS	1700+32
ki-[6] 'act of doing/ state of being X'	78	i-…-ana renders X into relative verb	1991				
mi- ACTIV-	4312	aᵐpi-…-ina renders X into passive verb	31				
ᵐpi- 'one who provides X'	1975						
t͡sɪ- 'instance of X'	46						
ku- 'that which is X'	44						
faᵐpi- PASS-	53						
maᵐpi- ACTIV-	693						
ᵐpaᵐpi-	20						

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[5] The counts of the *–na* allomorph might be inaccurate, as it also serves as the allomorph to another passive suffix, *–ana* (Richardson 1885). Regardless *–na* surfaces as a result of hiatus repair in the language (*cf.* Albro 2005, Lin 2005, O'Neill 2015, *a.o.*).

[6] ki-/ku- could be allomorphs of the same morpheme—but even if this is were true, their distributions do not appear to be conditioned by neighboring vowels (ki-: http://malagasyword.org/bins/derivLists?form=ki~#longScroll; ku-: http://malagasyword.org/bins/derivLists?form=ko~#longScroll)

'one who provides X'	

Table 3: *different frequently occurring affixes and their counts*

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