Emergent phonology illustrated: Malagasy alternations*

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SUMMARY

We use the vehicle of Malagasy sound patterns to illustrate how a phonological grammar is built under the model of Emergent Phonology, looking at both a phonological C/∅ alternation and a morphophonological oral/nasal alternation, also known as "nasal substitution".

RÉSUMÉ

Nous nous servons du modèle sonore du malgache pour illustrer comment se construit la grammaire phonologique dans le modèle de la Phonologie mergente; nous analysons à la fois l'alternance phonologique C/∅ et une alternance morphophonologique orale/nasale, aussi appelée « substitution nasale ».

1 INTRODUCTION

Emergent Phonology (Archangeli and Pulleyblank 2015, 2016, 2018) assumes a minimal role for universal, innate, phonology-specific principles: The learner uses cognitive capacities such as recognizing similarity, tracking frequency, creating a symbolic system (a grammar). In this way, Emergence is a profoundly bottom-up model. Our goals in examining Malagasy are to explore acquisition under Emergence and to elucidate analysis within the model. To this end, we explain how different classes of phenomena are encoded in the Emergent model, showing how both systematic and idiosyncratic properties of patterns are expressed. A consequence of Emergence for Malagasy is that there is no appeal to "absolute neutralization" involving abstract segments. We focus our discussion on Official Malagasy (or Merina Malagasy "which is the basis of standard Malagasy" Dziwirek 1989, p. 1), one of the two official languages of Madagascar (along with French). For simplicity, we call the language Malagasy.

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2 BACKGROUND ON MALAGASY

We take our data from Aly (1969); Garvey (1964); Dziwirek (1989); Keenan and Razafimamonjy (1996); Keenan and Polinsky (1998); Albro (2005); O'Neill (2015).[1] These sources show that Malagasy has a wide variety of phonological patterns affecting both vowels and consonants; we limit our discussion to two consonantal patterns. We begin with some background.

MALAGASY CONSONANTS Obstruents are found in voiceless/voiced pairs.There is a further pairing: stops and affricates are found in oral/prenasalized pairs, a pairing that figures prominently below. Also important, Aly (1969, p. 23-24) notes that [h] "is only detected in formal careful speech". The [h]/∅ alternation interacts with the second pattern discussed here.

(1) Malagasy consonants[2]

	Bilab		LaDent		Dental		Alveolar		Post-alv		Velar		Glot
Stops	p	b			t	d					k	g	
Prenas. stops	^{m}p	^{m}b			^{n}t	^{n}d					^{ŋ}k	^{ŋ}g	
Affricates							ʦ	ʤ	t^{r}	d^{r}			
Prenas. affricates							^{n}ʦ	^{n}ʤ	$^{n}t^{r}$	$^{n}d^{r}$			
Fricatives			f	v			s	z					h
Nasal sonorants		m						n					
Oral sonorants		w						l, r		y			

Inspection reveals that the obstruent inventory is quite symmetrical, but that nasals are restricted to the front of the mouth: there is no [ŋ] (except as part of a prenasalized stop).

(2) Velar nasal condition *[sonorant, velar, nasal] Penalize nasal sonorants.

MALAGASY NC & SYLLABLES We address here our assumption that prenasalized consonants are single segments. (See Dziwirek 1989 for a two-segment analysis; O'Neill 2015 remains agnostic.)

Garvey (1964) points out that there is free variation between a prenasalized stop and heavy nasalization of a vowel followed by an oral stop: "/b̃/ [our "^{m}b" – da/dp] is a nasalized voiced bilabial stop, either [^{m}b], a voiced bilabial stop with homorganic nasal onset...or, [Ṽb], a voiced bilabial stop following any heavily nasalized vowel." (Garvey, 1964, p. 12); similar statements are made in the description of each of the prenasalized consonants, as mentioned in O'Neill 2015. Missing from attested possibilities is a sequence of a vowel followed by a nasal consonant followed by an oral stop: *[amb], *[ãmb]. The variation is shown in (3). Garvey takes this as evidence that

[1] O'Neill (2015) focuses primarily on Betsimisaraka Malagasy, noting differences from (standard) Malagasy.

[2] The consonants represented as [t^{r} d^{r}] are described variously in the literature, as "single voiceless affricates articulated with the front part of the blade of the tongue against the alveolar ridge" (Keenan and Razafimamonjy 1996, p. 32) and as retroflex (Keenan and Polinsky 1998, p. 622 citing Domenichini-Ramiaramanana 1977). Whether these sounds are retroflex or have some other articulation does not affect our discussion.

these are single segments, not a nasal-obstruent sequence. (Garvey 1964 does not explain the nature of the juncture indicated by "." in (3).)

(3) Free variation of "prenasalized consonants" (Garvey 1964)

a[^{m}p]íta	[ãp]íta	'across from'	man[ú^{m}b]uka	man[ũ̂b]uka	'begins'
a[^{n}t]ánana	[ã]tánana	'in the hand'	a[^{n}d]álana	[ãd]álana	'on the way'
ma.á[^{n}t^{r}]a	ma.[ã̂t^{r}]a	'poor'	a[^{ŋ}k]ízi	[ãk]ízi	'child'
a[^{ŋ}g]áb̃a	*(not given)*	'maybe'	fá[^{n}ʦ]ika	f[ã̂ʦ]ika	'nail'
a[^{n}ʣ]ára	[ãʣ]ára	'part'	ma[^{n}d^{r}]ái	m[ãd^{r}]ái	'takes'

Erwin (1996) notes that the one-segment analysis simplifies phonotactics. For instance, palatalization following [i] occurs with both plain and prenasalized velars, [maik^{y}a] and [mai^{ŋ}k^{y}a] (Pearson 1994), understood as assimilation between adjacent segments under the one-segment analysis, but which requires assimilation to skip a segment under the two-segment hypothesis. Erwin (1996) also argues that the single-segment hypothesis simplifies syllabification, rendering Malagasy a CV language. This is consistent with stress patterns since consonants have no effect on stress.

Hence, Malagasy "NC" segments count as single segments; syllables are CV.

(4) Malagasy onset phonotactic Onset: Penalize each vowel-initial syllable.

(5) Malagasy coda phonotactic *Coda: Penalize each consonant-final syllable.

SUMMARY In our brief exploration of Malagasy consonants and syllables, we have presented reasons to view prenasalized stops as single segments, and proposed three conditions, penalizing [ŋ] (2), onsetless syllables (4), and codas (5). We now turn to the first of our two alternations.

3 PHONOTACTICS IN ACTION: C/∅ ALTERNATIONS

Some roots show an alternation between a consonant-final form and a vowel-final form, (6).[3]

(6) **C/∅ alternation**

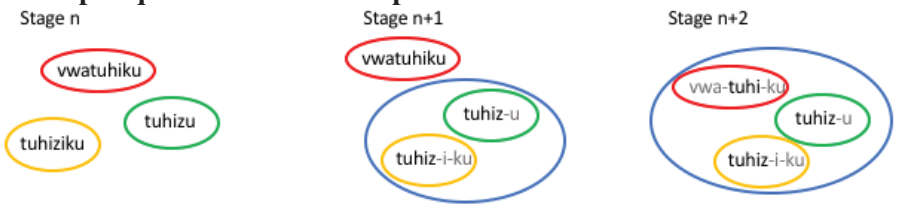
	morph-final V			morph-final C	
active	m-a-nuhi	'tie'	passive	tuhiz-i-ku	'tied by me'
perfective	vwa-tuhi-ku	'tied by me'	passive imp	tuhiz-u	'tie!'

A learner who has already identified the sounds of Malagasy will use those sounds to begin to store longer sequences (Martin et al. 2013). At Stage *n* in (7), the learner has not established relations between chunks like [tuhi]/[tuhiz]. As similarity of sound and of meaning converge, sets of items form, stripping off other morphs and grouping remaining morphs as tokens of the same thing, Stage *n+1*. At Stage *n+2*, the learner has identified a new chunk, [tuhi], similar in meaning and sound to

[3] (6) shows active and passive forms; these are discussed in section 4. Non-alternating vowel-final forms are comparable when word-final or pre-consonantal, e.g. [m-a-núlu] 'change', but quite different when prevocalic, e.g. [sulú-y-ku] 'changed by me' (vs. [tuhiz-i-ku]) and [f-a-nulú-na] 'the changing' vs. [f-a-nuhiz-a-na].

[tuhiz]. As learning progresses, and multiple sets like {tuhiz, tuhi}$_{\text{TIE}}$ are identified, the learner will notice a similarity across sets: sets with a consonant-final morph also have a vowel-final morph.

(7) **Bottom-up acquisition of such morph sets**



The generalization can be expressed as a Morph Set Relation, characterizing a general property of the language and predicting that newly acquired C-final verb morphs will also have V-final morph.

(8) Morph Set Relation: C-final implies V-final: $\exists\, M_i, M_i \ni V_k C\,\# \rightarrow \exists\, M_j, M_j \ni V_k\,\#$
If a morph set includes a morph ending in a consonant then it also includes a morph without that consonant, ending with a vowel instead.
example {tuhiz}$_{\text{TIE}}$ → {tuhiz, tuhi}$_{\text{TIE}}$

When morphosyntactic features identify morph sets for phonological realisation, the members of the sets are combined. A set containing multiple morphs results in more than one way to realize the features. For example, the features TIE-PASSIVE.IMPERATIVE identify both the set {tuhiz, tuhi}$_{\text{TIE}}$ and the set {u}$_{\text{PASSIVE.IMPERATIVE}}$. Combining these forms results in two possibilities, [tuhiz-u] and *[tuhi-u]. The learner needs a means of selecting among the combinatorial alternatives. The first place to look for resolution is in the phonotactics of the language, such as Onset (4) and *Coda (5).

The tables in (9)i,ii depict the assessment of both TIE-PASSIVE.IMPERATIVE and PASSIVE-TIE-1SG, each of which admits two possible combinations.[4] In (9)i, the winning combination has only CV syllables; the losing *[tu.hi.-u] violates Onset. In (9)ii, we see a *Coda violation for *[vwa.-tu.hiz.-ku], the winning [vwa.-tu.hi.-ku] avoids the violation due to the V-final morph.

(9) Selecting between {tuhiz, tuhi}$_{\text{TIE}}$

i. {tuhiz, tuhi}$_{\text{TIE}}$-{u}$_{\text{PASS.IMP}}$

		TIE-PASS.IMP	*Coda	Onset
→	a.	[tu.hi.z-u]		
	b.	[tu.hi.-u]		*!

ii. {vwa}$_{\text{PASS}}$-{tuhiz, tuhi}$_{\text{TIE}}$-{ku}$_{\text{1.SG}}$

		TIE-PASS.1SG	*Coda	Onset
	a.	[vwa.-tu.hiz.-ku]	*!	
→	b.	[vwa.-tu.hi.-ku]		

To review, we have made three points. First, by treating Malagasy "NC" as a single segment, syllabification can be characterized by two general phonotactic conditions, Onset (4) and *Coda (5). Second, bottom-up acquisition leads in some cases to morph sets with multiple members. Third,

[4] The general idea of Assessment tables is familiar from Optimality Theory (Prince and Smolensky 1993; McCarthy and Prince 1995), but there are differences. The top left cell holds morphosyntactic features. The conditions in the top row are only those motivated for the language; the forms to consider in the lefthand column are all and only those created by combining the morphs in the sets called up by the morpho-syntactic features. Violations of conditions are marked with *; fatal violations with !; → marks the winner if attested, ← marks the winner if unattested; finally, (→) marks the attested form where it is a loser. Syllable boundaries are marked by periods.

Onset and *Coda select among competing forms when morph sets are combined.

In the next section, we turn to the nasal-initial morphs.

4 MORPHOTACTIC SELECTION: THE DISTRIBUTION OF NASAL-INITIAL MORPHS

We begin with background on the morphological structure of verbs, based primarily on Keenan and Polinsky (1998) who use the terms *active* and *passive* to indicate argument structure of verbs: passive verbs (or non-active verbs) require genitive complements while complements of active verbs are either nominative or accusative. (See Guilfoyle et al. 1992; Travis 2005a,b among others for the syntactic behavior of active and passive verbs in Malagasy.) Prefixes that attach to verb roots determine the case for complements and so determine whether a form is active or passive.

MSR: VERB ROOT FORM Of interest is the form of the verb root following the active prefix $\{a\}_{\text{ACTIVE}}$, typically represented with the nasal as part of the prefix, either "aN-" (Keenan and Razafimamonjy 1996; Paul 1996; Keenan and Polinsky 1998) or "an-" (Dziwirek 1989; Guilfoyle et al. 1992; Erwin 1996; Albro 2005; Travis 2005a,b). The root is nasal-initial, referred to in the Austronesian literature as "nasal substitution" (see De Guzman 1978; Archangeli et al. 1998; Pater 1999, 2001; Archangeli et al. 2017; see also Blust 2004 for a general survey). We first consider verb roots that begin with a voiceless obstruent. As seen in (10), roots with an initial voiceless obstruent have a counterpart with a nasal consonant. The nasal form only occurs after the prefix $\{a\}_{\text{ACTIVE}}$.

(10) Regular alternations with voiceless obstruents (data from Garvey 1964)

pétʳaka	mamétʳaka	'places'	sása	manása	'washes'
fénu	maménu	'fills'	téri	maneri	'tightens'
			tsáŋgana	manáŋgana	'erects'

These pairs give rise to morph sets with systematic patterns uniting its members, characterized by the MSR in (11). (The two MSRs discussed combine to produce sets like {tuhiz, tuhi, nuhiz, nuhi}$_{\text{TIE}}$.) The morph set relation in (11) is not reciprocal, as shown by verb roots with no oral-initial counterpart: [manínina] 'regrets' (root: [nínina]); [maᵐbóᵐba] 'covers' (root: [ᵐbóᵐba]).

(11) Morph Set Relation: oral-C implies nasal-C

$\exists\, M_i, M_i \ni \#\left[\begin{smallmatrix}\text{oral}\\ \text{voiceless}\end{smallmatrix}\right]_k \rightarrow \exists\, M_j, M_j \ni \#\left[\begin{smallmatrix}\text{nasal}\\ \text{voiced}\end{smallmatrix}\right]_k$; $M_i \ni [\text{labial}]_k$, $M_j \ni [\text{labial}]_k$ else $M_j \ni [\text{coronal}]_k$

If a morph set includes a morph beginning with a voiceless oral consonant then it also includes a morph beginning with a corresponding nasal consonant. If the oral consonant is labial, so is the nasal consonant. Otherwise the nasal consonant is coronal.

example $\{\text{petʳaka}\}_{\text{PLACE}} \rightarrow \{\text{petʳaka, metʳaka}\}_{\text{PLACE}}$

$\{\text{tuhiz}\}_{\text{TIE}} \rightarrow \{\text{tuhiz, nuhiz}\}_{\text{TIE}}$

Given this statement of the voiceless oral/nasal MSR, we expect the velar [k] to also pair with [n] and that is exactly what is found in Malagasy: [manétsa] 'transplants-rice' (root: [kétsa]).

SELECTING THE CORRECT MORPH We now turn to the question of when to select a nasal-initial morph and when to use an oral-initial morph. Observation shows the nasal-initial forms follow only one prefix, the active "aN".[5] Surface forms show that this prefix prefers a following nasal consonant, something that is not a general property of [a]-final prefixes ({vwa}$_{\text{PERFECTIVE}}$: [vwa-tuhi-ku] 'tied by me' (Dziwirek, 1989, p. 5), nor of other active prefixes, e.g. {a} (see footnote 5): [natori] 'saw' (n$_{\text{PAST}}$ + a + tori$_{\text{SLEEP}}$), *not* *[nanori] (Keenan and Razafimamonjy, 1996, p. 592).

The special property of this prefix is that it prefers to be followed by a nasal consonant. We depict this in the representation of the morph set: {a$_{}_{[\text{NASAL}]}$}$_{\text{ACTIVE}}$. This requirement is evaluated during assessment: the relevant condition is Nasal Selection. Selection in general penalizes any morph string whose selectional requirements are not satisfied.

(12) Nasal selection (Nas-Sel, N-Sel)
Penalize a morph string which does not meet its [nasal] selection requirements.

Where Selection is not in force, oral morphs are preferred. This means that oral morphs are the default. Since oral-initial morphs are systematically the default, the property of Default can be assigned to the oral-initial morphs by MSR. A condition Default penalizes any non-default morphs.

(13) Default selection (Def)
Penalize any morph string which is not the default in its morph set.

Nasal Selection must outrank Default, as (14) shows. In (14)i, Nas-Sel eliminates option (a) because the root does not begin with the required [nasal] sound; in (14)ii, option (a) is preferred: since there is no morph to activate Nas-Sel, Def chooses the form with the initial oral consonant.

(14) Selecting between {fenu, menu}$_{\text{FILL}}$

i. {m}$_{\text{PRES}}$-{a$_{}_{[\text{NAS}]}$}$_{\text{ACT}}$-{fenu, menu}$_{\text{FILL}}$

	PRES-a.ACT-PLACE	N-Sel	Def
a.	[m-a$_{}_{[\text{nas}]}$-fenu]	*!	
→b.	[m-a$_{}_{[\text{nas}]}$-menu]		*

ii. {m}$_{\text{PRES}}$-{i}$_{\text{ACT}}$-{fenu, menu}$_{\text{FILL}}$

	PRES-i.ACT-PLACE	N-Sel	Def
→a.	[m-i-fenu]		
b.	[m-i-menu]		*!

Forms beginning with voiced obstruents also have nasal-initial counterparts, also occurring immediately after the {a$_{}_{[\text{NASAL}]}$}$_{\text{ACTIVE}}$ prefix. These are illustrated with non-labial consonants in (15).[6]

(15) Initial non-labial voiced consonants

lé.a	ma^{n}dé	'goes'	záit^{r}a	ma^{n}ʤáit^{r}a	'sews'
dídi	ma^{n}dídi	'operates'	ʤú^{n}buna	ma^{n}ʤú^{n}buna	'grows dark'
ráva	ma^{n}d^{r}áva	'destroys'	gína	ma^{ŋ}gína	'stays silent'

In the interest of space, we do not provide an explicit MSR or assessments for the voiced paradigm; suffice to say that the MSR is similar to that in (11) and the assessments proceed as expected.[7]

[5] The major active prefixes are *i-*, *aN-*, *a-*, and ∅ (Keenan and Polinsky 1998, p. 591). Both *aN-* and *i-* are fairly productive; *a-*, and ∅ apply to closed sets of roots.

[6] We did not find any [d^{r}] initial forms, though we also found no comment about this as a gap.

[7] There is one caveat: Recall from the discussion of (3) that segments depicted as prenasalized consonants may have one

We now turn our attention to two remaining classes, those that begin with an initial voiced labial [b] or [v], and those that begin with an initial [h] and/or an initial vowel. These cases illustrate how systematic subclasses are handled under Emergence – by lexical partitions.

5 LEXICAL PARTITIONS: NO ABSTRACT REPRESENTATIONS

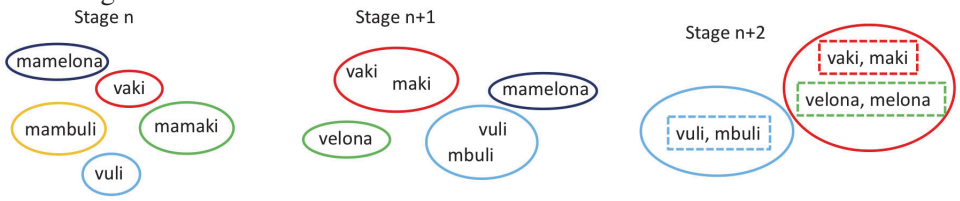
Initial voiced labials were omitted from (15) because, as shown in (16), there are two different nasal counterparts for initial [b] and [v]. From (15), we might expect these sounds to pair with the prenasalized stop [^{m}b], and as (16)a shows, there are forms of this type. However, as seen in (16)b, both /v/ and /b/ can also pair with a plain nasal [m].

(16) Initial voiced labials (Garvey 1964)

a.	vúli	ma^{m}búli	'plants'	b.	váki	maváki	'breaks'
	bóraka	ma^{m}búraka	'unties'		bùsibúsika	mamùsibúsika	'eats fast'

For such data, we assume the same general algorithms for acquisition as discussed with (7). The earliest stage of learning a morph set begins with each identified token in a class, or partition, by itself, Stage n in (17). As acquisition continues, two things happen: (i) where sound and meaning converge on similarities, sets of morphs are created and (ii) new lexical items are added, Stage n+1. Ultimately, similar morph sets are grouped into partitions. Similarities among members of the partitions enable the learner to posit MSRs; unlike the MSRs above, with initial [v] and [b], a learner cannot know which partition a lexical item belongs to until the nasal-initial form is perceived.

(17) Partitioning the lexicon



Pairing morph sets with morphosyntactic features results in morph sets like {<u>vúli</u>, ^{m}búli}$_{\text{PLANT}}$ and {<u>váki</u>, máki}$_{\text{BREAK}}$, with oral-initial defaults. Nas-Sel and Default again make the correct choices.

A similar phenomenon is found with [h] and vowel-initial words. Such words fall into two classes, just as the [v]/[b] words do. Examples where the two sounds alternate with [n] are given in (18)a; in (18)b are forms that alternate with [^{ŋ}g].[8]

of two realizations: a prenasalized consonant or a nasal vowel followed by an oral consonant. This implies that, since the voiced consonants alternate with prenasalized stops, an alternative for the prefix in these cases is [ã], though we found no direct discussion of this in the literature. If it is true, then prefix morph set has two members, {ã, a_[NASAL]}$_{\text{ACTIVE}}$. The nasal vowel can only occur before voiced oral consonants; it cannot occur before voiceless oral consonants in this paradigm (which may be accomplished by a morph-level restriction or by a phonotactic against adjacent nasal sounds). Importantly, this set has no default since the two pronunciations appear to be in free variation. The assessments, then, would result in two surviving morph combinations, e.g. [mãdé] or [ma^{n}dé] 'goes'. Because this is speculative, we continue to represent the prefix as {a_[NASAL]}$_{\text{ACTIVE}}$, ignoring the [ã] possibility.

[8] Recall that [h] is rarely heard in casual speech, primarily or only appearing in careful, formal speech. This may be

(18) Initial vowels and/or [h]

a.	aikitʳa	manaikitʳa	‘bites’	b.	átaka	maᵑgátaka	‘requests’
	heti	maneti	‘cuts (hair)’		hátaka	maᵑgátaka	‘asks’
					hóvitʳa	maᵑgóvitʳa	‘shivers’

The analysis for V/[h] initial words again involves partitions; the learner cannot know the appropriate partition for forms beginning with V, [h], [n], [ᵑg]. Both members of a morph set must be identified. However, because the relations between the initial consonants are systematic within a morph set, MSRs will be posited. Such MSRs play a role in language, even though they cannot freely generate new forms with full confidence. Especially where there is an imbalance in the size of the partition characterized by MSR_j, when new forms of the relevant shape are encountered, MSR_j will suggest a corresponding morph. This can lead to language change in the direction of the more frequent MSR, as well as a default for borrowings.

6 DISCUSSION

In this paper, we introduced two patterns in Malagasy, one resolved by phonotactic selection and the other by morphotactic selection. The analysis illustrates several aspects of Emergent Phonology.

EMERGENT PHONOLOGY Emergent Phonology is a bottom-up model resulting in a grammar containing lexical morph sets, relations among members of morph sets, and conditions to select the morphs in a given combination. A grammar’s properties are determined directly from surface forms.

Morph sets with multiple members are characterized by Morph Set Relations to express regularities between the members. MSRs state properties relating members of morph sets, such as MSR C-final implies V-final (8) and MSR oral-C implies nasal-C (11). MSRs may assign abstract properties, such as “default”. MSRs may be very general or specific to lexical partitions (as seen in section 5). The more general the MSR, the easier to learn and the more stable the pattern.

Some morphs may place requirements on co-occurring morphs: in Malagasy, there is a prefix that requires a following nasal consonant, $\{\text{a}_{\text{\_[NASAL]}}\}_{\text{ACTIVE}}$ (see also footnote 7). In the Malagasy case, the requirement is an idiosyncratic property of a single morph, and so is not assigned by MSR but is simply learned as a property of this morph, along with learning the vowel quality and meaning.

Having multiple morphs in a morph set raises the issue of when to use which morph; this is adjudicated by phonotactic and morphotactic conditions. Phonotactic conditions refer solely to phonological properties of the string; Onset (4) and *Coda (5) refer to properties of the arrangement of Cs and Vs. These conditions governed the choice between C-final and V-final morphs. Morphotactic conditions included Nasal Selection (12) and Default (13). When a morph places a requirement on adjacent elements, Selection assesses whether those requirements have been satisfied. Default penalizes any non-default morph in a string. Assessment tables are a way of showing that a particular analysis selects the correct set of morphs to spell out a particular set of morphosyntactic features.

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the cause of the V-initial representations found in Garvey (1964) and the [h]-initial representation given in Keenan and Polinsky (1998) for ‘ask, request’, see (18)b.

ACQUISITION & LANGUAGE CHANGE There are a variety of ways in which acquisition can result in different individual grammars, which in turn could lead to language change (Blevins 2004). For example, the analysis of the oral/nasal pattern proposed here involves a vowel prefix, with consonant nasalization occurring as a property of the root morph. An alternative is possible, where nasal is a property of the prefix and root morphs have initial oral consonants or initial vowels. Thus, the model predicts the possibility of different idiolects, where learners acquire slightly different but mutually-intelligible grammars. Such idiolectal shift may lead to dialectal shift and may be passed from one generation to the next, leading to change over time.

Some patterns are more resistant to ambiguous representation in the grammar and so more resistant to change. Acquisition begins with the sounds; sounds themselves occur in patterns. We expect early and stable acquisition of general phonotactic conditions such as Onset and *Coda. The evidence is robust; the conditions can be acquired based on phonological strings alone, in advance of figuring out semantic relations among words and isolating morphs from words.

The predicted phonotactic stability contrasts with predicted instability among the items beginning with [b], [v], [h], or a vowel (see (16), (18)). These morph sets are accurately passed from one generation to the next only by the learner perceiving and relating both the oral and the nasal member of each morph set, paving the way for inaccurate transmission.

THEORETICAL IMPLICATIONS We close with noting implications of this approach and analysis for underlying representations and the related concept of abstractness: neither obtains under Emergence. The morph set replaces the underlying representation; each member of a morph set corresponds directly to a surface form. In the Malagasy case, this means that analysis of the [b]/[v] and [h]/V facts involves partitions in the lexicon between two systematic patterns for initial [b]/[v] and for initial [h]/[V]. This is in sharp contrast to, for example, Albro (2005), which posits a two-phonemes-with-neutralization solution in each case, an analysis adopted in O'Neill (2015). Under Emergence, there is no motivation to posit abstract phonemes: they never appear at the surface.

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