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Oceanic Linguistics, Volume 48, Number 1, June 2009, pp. 264-273 (Article)



Published by University of Hawai'i Press

DOI: 10.1353/ol.0.0033

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Squib

Another Universal Bites the Dust: Northwest Mekeo Lacks Coronal Phonemes

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On the basis of cross-linguistic comparison, many universals have been proposed concerning the structure of phonological inventories. One universal of this kind states that every phonological system has coronal phonemes. In this study, Northwest Mekeo, an Oceanic language of Papua New Guinea, is shown to be a counterexample. Northwest Mekeo lacks coronal phonemes, though surface coronals are found as predictable allophones of velar phonemes, and in some recent loans.

1. PHONOLOGICAL INVENTORY UNIVERSALS: ABSOLUTES OR TENDENCIES?¹ In a recent review of phonological universals, Hyman (2008) attempts to summarize what is universal about phonological inventories. Four universals of consonant systems are proposed, and are claimed to characterize consonant inventories of all spoken languages. These universals are:

Consonant Universal #1: Every phonological system has oral stops.

Consonant Universal #2: Every phonological system contrasts phonemes that are [-cont] (= stops) with phonemes that are specified with a different feature.

Consonant Universal #3: Every phonological system contrasts phonemes for place of articulation.

Consonant Universal #4: Every phonological system has coronal phonemes.

In this squib, I present counterevidence to Consonant Universal #4. I show that there is at least one well-described Oceanic language, Northwest Mekeo, which does not have coronal phonemes. Before turning to the data, the basis of this proposed universal is briefly reviewed, along with differences between absolute universals like those above, and universal tendencies (also known as statistical universals or soft universals).

Hyman's phonological universals are based, for the most part, on the UPSID database of 451 languages (Maddieson and Precoda 1990). Consonant Universal #4 is a restatement of Maddieson's (1991:200) observation that "languages in all parts of the world have at least one coronal consonant—there are no exceptions in UPSID, and also none are known outside the sample." It is also observed that "when all consonants are taken

1. A version of this squib was presented as part of a larger study of diversity in Oceanic sound patterns at the Directions in Oceanic Research Conference, University of Newcastle, New South Wales, in December 2008. I am grateful to participants there for comments, and to Bernard Comrie and two anonymous referees for additional suggestions.

into consideration, UPSID reveals that languages may lack bilabials (e.g., Wichita), or velars (e.g., Klao, Vanimo), but not coronals” (Hyman 2008:94). Since the UPSID database is meant to be genealogically balanced, with only one language included from relevant subgroups, it is not the best tool for investigating family-internal or subgroup-internal diversity. While this is less of a drawback for small to midsize language families, for Austronesian, with approximately one thousand languages, this quota system will result in great underrepresentation of family-internal diversity.

The universals stated above, including Consonant Universal #4, are absolute universals. Absolute universals are claimed to be inviolable. As defining characteristics of phonological systems of all spoken languages, there is typically an attempt to associate them with universal aspects of phonetics, or to insist that they are part of the innate linguistic knowledge all humans are endowed with, as components of Universal Grammar. In the case of 1–4 above, it is difficult to see how any would follow directly from universal aspects of phonetics. There is nothing intrinsic to the phonetics of consonants that requires that *every* phonological system have stops, that these stops contrast with other consonants, that consonants at more than one place of articulation occur, and that at least one consonant in a language make use of the front part of the tongue. These Universals specify a minimal system of consonantal contrasts, but there is no obvious phonetic explanation for why languages should prohibit deviations from these. If the universals above are attributed to Universal Grammar, deviations are prohibited by fiat, and may be attributed to theory-internal conceptions of markedness. Consonant Universal #4, for example, might be associated with a universal place of articulation markedness scale that characterizes coronal (in contrast to labial or velar) as the least marked place feature (Kean 1975, Blust 1979, Paradis and Prunet 1991, de Lacy 2006).²

In contrast to absolute phonological universals determined by universal phonetics or Universal Grammar, universal tendencies (also known as soft universals, statistical universals, or recurrent sound patterns) may be explained in terms of phonetic tendencies, including common pathways of phonetically based sound change. One of the central findings of Evolutionary Phonology (Blevins 2004, 2006, 2008) is that many claimed absolute universals are better treated as tendencies of this kind. Within this approach, the frequent use of coronal consonants as contrastive sounds in segment inventories is attributed to four primary factors: (i) basic coronal sounds (e.g., /t/, /n/) are not difficult to produce in a neutral V_V context; (ii) basic coronal sounds (e.g., /t/, /n/) are not difficult to distinguish auditorially from labials (/p/, /m/) or dorsals (/k/, /ŋ/) in a neutral V_V context; (iii) basic coronal sounds (e.g., /t/, /n/) are relatively stable and are often inherited without change; (iv) there are natural phonetic pathways by which coronal sounds can evolve from noncoronals (e.g., velar palatalization, palatal glide strengthening, place assimilation). An additional secondary factor is dependent on primary factors: the high frequency of coronals in the world’s languages makes it more likely for a language lacking coronals to acquire them via contact. Data from Mekeo, presented below, provides direct support for this approach. Northwest Mekeo lacks contrastive coronal consonants, making Universal #4 untenable as an absolute universal. At the same time, recent changes in Mekeo

2. Though see challenges to these proposals in, e.g., McCarthy and Taub (1992), Blevins (2004:125–29), and Blevins (2008).

illustrate how quickly a language can acquire coronals through natural sound change and contact-induced change.

2. NORTHWEST MEKEO: A LANGUAGE WITHOUT CORONAL

PHONEMES. Mekeo is an Austronesian language of Papua New Guinea, classified by Ross (1988) as a Western Oceanic language, and a member of the Papuan Tip Cluster. A detailed description of the language is provided by Jones (1998), where four regional dialects or varieties are distinguished: Northwest Mekeo (also known as Kovio), West Mekeo, North Mekeo, and East Mekeo.³ Each dialect has a distinct phonology, with regular sound correspondences relating them, and all dialects have the five vowel system /i e a o u/. Northwest Mekeo consonant phonemes are shown in (1), with allophones described in (2).

(1) NORTHWEST MEKEO consonant system

	Labial	Palatal	Velar	
Obstruents, voiceless	p		k	
Obstruents, voiced	β		g	
Nasals	m		ŋ	
Glides	w~o	y~ε		(Jones 1995, 1998)

(2) Consonantal allophones in NORTHWEST MEKEO

- /p/ voiceless bilabial stop
- /β/ voiced bilabial fricative; the main (free) variants are [b] and [v]
- /m/ bilabial nasal continuant
- /w/ vocoid approximant freely intervarying with [o]
- /k/ voiceless velar stop
- /g/ voiced velar stop; the main (conditioned) allophone is [dz̥] before /i/
- /ŋ/ velar nasal continuant with the occasional unconditioned variant [n]
- /y/ palatal approximant (a glide) intervarying with [ε] (a flattened mid-front vowel with some pharyngealization) (Jones 1998:559)

There are no coronal consonants in this system. The primary place contrast is between labial and velar places of articulation for all but the glides, where the common labiovelar vs. palatal contrast is observed.⁴ Northwest Mekeo, then, appears to be a counterexample to Consonant Universal #4, since it does not have coronal phonemes.

Correspondences between Northwest Mekeo consonants and consonants in other Mekeo varieties are shown in (3). Other Mekeo dialects also lack /t, d, n/ but show /l/, a coronal lateral approximant. The phoneme /l/ can be considered primarily [lateral] (or nonnasal), with redundant specification of coronal. Under this analysis, all Mekeo dialects might qualify as counterexamples to Consonant Universal #4 above, since in no case would coronal be contrastive for a particular manner class.

3. A shorter synopsis is presented in Jones (1995), and a basic wordlist is now available in the Austronesian Basic Vocabulary Database (Greenhill, Blust, and Gray, 2003–8). Recordings of religious material in Northwest Mekeo (Kovio) can be heard at <http://globalrecordings.net/program/C21420>.

4. Note that /w/ and /y/ (IPA [j]) are both approximants that vary freely with back and front mid vowels respectively. As such, they should likely be excluded from generalizations about consonantal contrast, but even so, neither is a “coronal” under a definition in which coronal consonants involve a closure or significant constriction made with the front part of the tongue.

(3) NW MEKEO	β	p	w/o	g	k	m	ŋ	y/e
W MEKEO	b	p	w	g	k	m	ŋ	l
N MEKEO	b	f,w		g,k		m	ŋ	l
E MEKEO	p	f		k	ʔ/∅	m	ŋ	l

The absence of coronal phonemes /t/, /d/, /s/, and /n/ is striking in all Mekeo varieties and calls for some explanation. Comparative data in section 4 illuminates these gaps, and the loss of *l in Northwest Mekeo. However, before looking at the historical origins of the Mekeo consonant systems, I turn to surface coronals that arise from regular assimilatory and strengthening processes.

3. SURFACE CORONALS IN MEKEO. In all Mekeo dialects, including Northwest Mekeo, there are surface coronal phones. Three identifiable sources of these coronals are listed in (4).

- (4) i. Local assimilation to /i/
- ii. Consonant epenthesis + strengthening / i _ a
- iii. Loanwords, baby talk

In all varieties of Mekeo, the velar nasal /ŋ/ is pronounced as [n], a coronal nasal, when adjacent to a preceding or following /i/ (Jones 1995:777). Examples are shown in (5). In some lexemes, like (5a–c), the pattern is morpheme-internal, while in other cases, like the third person singular possessive suffix /-ŋa/, alternations are evident under suffixation to /i/-final stems (5d–e). Since in this case [n] is clearly an allophone of /ŋ/, and in complementary distribution with [ŋ], there is no basis for positing a phonemic contrast between /ŋ/ and /n/.⁵ Excluding loans, this assimilation is the only source of surface coronal nasals in Northwest Mekeo.

(5)	Phonemic	Surface (all dialects)	
a.	/uŋja/	unia	‘bone’
b.	/aŋi/	ani	‘seed’
c.	/iŋa/	ina	‘mother’
d.	/iŋa-ŋa/	inaŋa	‘his mother’
e.	/aŋi-ŋa/	anina	‘his seed’

Another assimilatory process is the palatalization of the velar stops /g/ and /k/ before /i/, producing alveopalatal or palatalized coronal affricates (Jones 1997:559). Alternations are summarized in (6).

(6)	NORTHWEST MEKEO	/g/ → [dʒ]	/ _ i
	WEST MEKEO	/g/ → [dʒ, dʒ]	/ _ i
	NORTH MEKEO	/k/ → [tʃ, dʒ]	/ _ i
	EAST MEKEO	/k/ → [tʃ, ʃ]	/ _ i (optional)

5. Jones (1998:559) describes [n] as an occasional unconditioned variant of /ŋ/, as noted in (2). However, the Northwest Mekeo wordlist he provides shows regular /ŋ/ → n / _ i, except when another velar occurs within the word, in which case the assimilation is inhibited, as in /guŋi/ ‘push’, Northwest Mekeo *guŋi*, but *guni* in all other dialects. The only cases of unexplained [n] I was able to find in the Northwest Mekeo wordlist are in apparent loans: *enene(a)* ‘road, path’ with noncognate *gia*, *gea-*, *kea-* in West, North, and East Mekeo, respectively; and *nene* ‘finger’, which shows irregular correspondences with West Mekeo *lelele*, North Mekeo *lele*, *gege*, and East Mekeo *keke?e*. If Jones’s description of Northwest Mekeo is correct, and [n] is an occasional unconditioned variant of /ŋ/, there is still no basis for positing /n/ as a phoneme, since /n/ and /ŋ/ are not contrastive.

In Northwest Mekeo and West Mekeo, with /g/ vs. /k/ contrasts, the process only applies to /g/; in North Mekeo and East Mekeo, where there is no /g/ vs. /k/ contrast, the process applies only to /k/; and in East Mekeo, palatalization is optional. Examples are given in (7), from (Jones 1997:556). In all varieties of Mekeo, velar palatalization gives rise to surface coronal obstruents, though, as with [n], these coronals are clear allophones of velar stops.

(7)	NW	W	N	E	
	gina	ɟgina	ʃina	kina	‘sun, day’
	(maki)	ɟʒiɟʒi	ʃiʃi	ʃiʃi	‘game meat’
	agi	aɟʒi	aʃi	aki	‘younger same sex sibling’

Finally, in the domain of velar palatalization, Jones (1997:14) notes that [t] tends to occur as a spontaneous pronunciation of /k/ before a high front vowel. Again, since there is no contrast between /k/ and /t/ in this context, there is no evidence of coronal phonemes in Northwest Mekeo.

A second source of surface coronals is a process of consonant epenthesis that Jones (1997:14, 557–58) refers to as “consonant intrusion.” Between historical vowel sequences, an excrescent consonant surfaces, varying in occlusion, from the optional palatal glide in Northwest Mekeo, to full-blown obstruents in other dialects, as illustrated in (8). Consonant epenthesis does *not* produce surface coronal consonants in Northwest Mekeo, where [y] (= IPA [j]) is optional in /ia/ sequences, but it does result in surface coronals in the other dialects.

(8)		i_a	i_o	u_V
	Northwest Mekeo	∅, y	—	—
	West Mekeo	d	(d)	—
	North Mekeo	z,ʒ,ʃ,s	(z,ʒ,ʃ,s)	—
	East Mekeo	s	(s)	v, f

Intervocalic epenthesis of the kind shown in (8) is natural and widespread in the world’s languages (Blevins 2008). What makes the Mekeo dialects of particular interest is the ability to detect distinct stages of glide epenthesis and glide fortition in the *i_a* context. Northwest Mekeo appears to represent the earliest stage of this process, with the vocalic transition perceived as containing an intervocalic glide. Occlusion of this glide results in segments like [ʒ], with lengthening resulting in spontaneous devoicing to [ʃ]. Nonpalatal allophones [z] and [s] appear to be related to the coronalizing effect of /i/ described in (5). Another important aspect of this sound change is its role in the eventual evolution of coronal obstruents. Although Northwest Mekeo remains coronal-free, the other Mekeo dialects may be in the process of phonologizing a coronal obstruent contrast. Although Jones (1998:557) says explicitly that the excrescent coronals in West, North, and East Mekeo are “entirely conditioned by the phonetic environment” and “still in the process of spreading through the lexicon, and not yet . . . in every word that provides the requisite conditions,” he also notes (1998:557, footnote 1) that “the intrusive consonants have in several cases already resulted in minimally contrasting pairs (W Mekeo *ida* ‘s/he, they’ versus *ika* ‘we’, *ipa* ‘blood’, etc.). As they become even less optional and spread right throughout the lexicon they will eventually become phonemes. Some might claim indeed that they should already be treated, synchronically, as phonemes.” While this might be true for North, East,

and West Mekeo, recall that Northwest Mekeo has only optional palatal glides in the same contexts, and hence, shows no evidence of incipient coronal phonemicization.

Surface coronals are also found in loan words. Jones (1998:14, fn. 22) notes that Mekeo is changing gradually in many ways due to the influence of “massive borrowing from English.” Before this massive influence, the absence of /t/, /s/, and /n/ in Mekeo resulted in English words with coronals being shifted to velars. For example, English *tea* was borrowed as /ki/, *soap* was borrowed as /kopu/, and *towel* was borrowed as /kauli/. In more recent times, the influence of English results in nonaltered loans like [tʃi] ‘tea’, [tʃopu] ‘soap’, [tauli] ‘towel’, [tsili] ‘chili pepper’, [tsiuka] ‘sugar’, [milika] ‘milk’, [tsiati] ‘shirt’, [tsokis] ‘socks’, and so on (Tryon 1995). In the Northwest Mekeo text published in Jones (1998:581–82), the author’s name, *Alan Jones*, and the English word *family* /famili/ are both pronounced with coronal consonants. Northwest Mekeo also has words with surface [l] that are borrowings from other Mekeo dialects, or other neighboring languages: for the meaning ‘good’, compare Northwest Mekeo *loβiana* with *lafia*, *Lapeka lobiana*, *Kuni yobiana* (Jones 1998:569), but West Mekeo *belo*, North Mekeo *velo*, East Mekeo *felo*.

Finally, surface coronals are also found in baby talk, where [t] is a frequent replacement for /k/ (or /g/ in North Mekeo). Since this kind of replacement is common cross-linguistically independent of whether or not /t/ is phonemic in a language, and since, in other languages, children also are found to replace /t/ with [k] (e.g., Inkelas and Rose 2007), this variation is difficult to evaluate. Together with the early loanword evidence, it might suggest that [t] is considered a close perceptual match to [k], and therefore a potential realization of /k/. Variants that appear to reflect child language forms are Northwest Mekeo *kikino*, *titino* ‘small’ (cf. Proto-Oceanic *kiki ‘small’) and *pokoā*, *potoā* ‘short’ (cf. Proto-Oceanic *botonj ‘short’).

In sum, coronal phones occur in all Mekeo dialects. In Northwest Mekeo, they are clear allophones of velars, or limited to recent loans in adult speech. Northwest Mekeo shows no evidence of coronal consonant phonemes, though other Mekeo dialects contain phonemic /l/, and may be in the process of acquiring a coronal obstruent (/d/ in West Mekeo, /s/ in East Mekeo) via the phonologization of historically epenthetic segments.

Languages without coronal phonemes are extremely rare. Northwest Mekeo is the only known case, though it is possible that a more comprehensive search of grammatical descriptions might turn up a few others. Why are languages of this kind rare? As suggested above, the strong tendency for spoken languages to make use of contrastive coronal consonants can be attributed to four primary factors: (i) basic coronal sounds (e.g., /t/, /n/) are not difficult to produce in a neutral V_V context; (ii) basic coronal sounds (e.g., /t/, /n/) are not difficult to distinguish auditorily from labials (/p/, /m/) or dorsals (/k/, /ŋ/) in a neutral V_V context; (iii) basic coronal sounds (e.g., /t/, /n/) are relatively stable and are often inherited without change; and (iv) there are natural phonetic pathways by which coronal sounds can evolve from noncoronals (e.g., velar palatalization, palatal glide strengthening, place assimilation). In addition, a language lacking coronals could easily acquire them via contact, given the high frequency of coronals in the world’s languages due to the primary factors just mentioned. In the following section, I briefly illustrate the somewhat unique set of sound changes that have eliminated coronals in Northwest Mekeo.

4. CORONAL LOSS AND CORONAL SHIFTS. As I mentioned above, Mekeo has been classified as a Western Oceanic language and a member of the Papuan Tip Cluster (Ross 1988; Jones 1998; Lynch, Ross, and Crowley 2002). Jones (1998:23–25) reviews the correspondences posited in Ross (1988). His summary suggests that the reduced Mekeo consonant inventory, which lacks coronal obstruents, is the consequence of two central sound changes following the break-up of Proto-Central Papuan: (i) loss of coronal stops; and (ii) shift of coronals (*t, *d, *l, *n, *s) to velars. A final sound change that leaves Northwest Mekeo without any coronal consonants at all is the vocalization of *l.

One unusual sound change that characterizes Mekeo is the loss of coronal stops in initial and medial positions, first noted by Ross (1988:204–5).⁶ In (9), Proto-Oceanic (POC) forms with initial or medial *t are given on the left. In Mekeo, these consonants have been lost. (Following Jones's [1998] transcription practice, the [n] allophone of /ŋ/ is written as <n> in the orthographic forms below, and epenthetic consonants in the *i_a* context are written when invariable.)

(9) POC	Proto-Mekeo	NW	W	N	E
*taliŋa 'ear'	*aiŋa	aina	aina	aina	aina
*tama 'father'	*ama	ama	ama	ama	ama
*tanoŋ 'earth'	*aŋo	aŋo	aŋo	aŋo	aŋo
*tau 'person'	*au	au	au	au	au
*tina 'mother'	*iŋa	ina	ina	ina	ina
*mata 'eye'	*maa	ma	ma	maa	ma
*mate 'dead, die'	*mae	mae	mae	mae	mae
*kita 'see'	*ia	ia	ida	iza, iya	isa

Another unusual sound change that has occurred in Mekeo is the shift of *t > k and *n > ŋ. Ross (1988:205) and Blust (2004:377) note that *t > k appears to be sporadic in Mekeo, perhaps due to diffusion of this sound change from the south where it is regular (Blust 2004:378). Some examples are shown in (10). The shift of *t > k has occurred multiple times within the Austronesian family (Blust 1990, 2004), and appears to have a plausible phonetic basis (Blevins 2004:122–25).

(10) POC	Proto-Mekeo	NW	W	N	E
*qate 'liver'	*ake	ake	ake	ake	aʔe
*kata 'laugh'	*aka	aka	aka	aka	laʔa
*kutu 'louse'	*uku	—	—	—	uʔu
*botonŋ 'short'	*potoa	potoa, poko	—	fokoa	foʔoa

Recall that, unlike other dialects, Northwest Mekeo has no /l/ phoneme. Proto-Oceanic *l has vocalized to /i/ and been lost before /i/, but retained before /u/ in all Mekeo dialects: *ima* (<*iima) < *lima 'hand', *taiŋa* (<*taiiŋa) < *taliŋa 'ear', *pui* (<*puii) < *pulu 'feather', and so on. Before nonhigh vowels, Proto-Oceanic *l is retained in East Mekeo but lost in other dialects, as in (11a–b). Another source of Mekeo /l/ is Proto-Oceanic *y. In medial position, this *y is vocalized to /e/ in Northwest

6. Perhaps even more remarkable, this loss of *t appears to be just one component of a general loss of voiceless stops *p, *t, *k in Proto-Mekeo. See Jones (1998:23–25) for a summary of changes from Proto-Central Papuan to Mekeo.

Mekeo, but shifts to /l/ in other Mekeo dialects, as in (11c–d). Retention of a non-lateral reflex of *y is one respect in which Northwest Mekeo may be conservative in comparison with other Mekeo dialects that show *y > /l/.⁷

(11)	POc	NW	W	N	E	
a.	*lalo—	ao	ao	ao	alo	‘in, inside’
b.	*lako	ao	ao	ao	e-lao	‘go’
c.	*puqaya	uaea	uala	uala	ufala	‘crocodile’
d.	*maya	maea	mala	mala	mala	‘tongue’

In sum, though each of the three sound changes noted above is attested in other languages, it is the confluence of the three that is unique to Northwest Mekeo, and that eliminates coronal phonemes from the language. While it is difficult to accurately assess the probability of these three sound changes cooccurring in any given language, since each is rare cross-linguistically, I assume that the confluence of the three should be even rarer.

5. SUMMARY REMARKS. The discussion above allows us to understand the rarity of coronal-less consonant systems in terms of coronal stability (common), coronal evolution (common), and coronal annihilation (rare). As we have seen in section 3, though Northwest Mekeo lacks coronal consonants, and other Mekeo dialects lack coronal obstruent phonemes, it seems only a matter of time before these contrastive sounds establish themselves in the language once more. Local assimilations and consonant epenthesis have given rise to numerous surface coronals in the language. As soon as the contexts for these conditioned allophones become opaque, new contrastive coronals will arise. Mekeo speakers are also using a large number of English loanwords. As these loans become integrated into the Mekeo language, and no are longer considered “English,” the coronals within them will also take on contrastive status within the Mekeo lexicon.

Northwest Mekeo is a clear counterexample to Universal #4 above: “Every phonological system has coronal phonemes.” Data from this language and related dialects show us not only how a coronal-less consonant system can evolve, but also help us understand why such systems are as rare as they are. At the same time, this is just one of many instances of untenable absolute universals in the phonological literature. Ferguson (1963) proposed that all languages have at least one primary nasal phoneme, but counterexamples were noted as early as Hockett (1955:119), and later by Thompson and Thompson (1972), Le Saout (1973), and Bentick (1975). Maddieson’s (1984, 2005) survey includes ten languages without primary nasal consonants, four of which have no phonemic nasal or nasalized segments of any kind. Explanations for the rarity of languages without primary nasal consonants run parallel to those proposed above: languages tend to have nasals because nasals are highly stable over time, and because context-free oral/nasal neutralization is an extremely rare sound change (Blevins 2004:211–13).

7. Jones (1998) assumes historical vocalization of *l to /y/ or /e/ in Northwest Mekeo. Context-free onset *l-vocalization is relatively rare cross-linguistically, but similar processes are described for some languages of Vanuatu by Lynch (2008). The situation may be more complex than described here. When closely related languages are compared, *y:e:l* correspondences can be found, as in NW Mekeo *aβaea*, W Mekeo, N Mekeo *abala*, E Mekeo *apala*, Iafia *abala*, Lapeka *abala-na*, Kuni *avaya-na* ‘bad’.

As more absolute universals “bite the dust,” we should not despair. The challenges posed by universal tendencies are just as great, if not greater, than those posed by absolute universals. We must understand not only why most languages have a particular property, but why there are the rare exceptions that do not. By meeting these challenges, we will ultimately have a deeper understanding of sound patterns as they reflect human potential in articulation, perception, and general cognition.

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