Contact-Induced Change and Phonology

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Abstract and Keywords

This chapter discusses aspects of CILC involving phonetics and phonology, exemplifying the wide range of possible phenomena, involving cases of transfer of fabric, transfer of pattern and of both. These examples are taken from a wide range of languages from around the world, and the chapter ends with brief case studies from two Austronesian languages, Chamorro (which has acquitted mid-vowels through contact) and Hainan Cham (which has readjusted its phonology to many features of Hainan Min Nan Chinese, including comprehensive adoption of lexicla tone). It is clear from the material presented here that the range of possibilities of change in the phonologies of languages which has been actuated by contact-induced change is almost limitless.

Keywords: phonetics, segmental phonology, templatic phonology, suprasegmental phonology, phoneme, intonation

3.1 Introduction

ONE of the clearest areas of language where the effects of contact-induced change can often be seen is in the phonological system of the affected language, and the forms that this change can take are extremely varied.[1] Allophones can become phonemes; preexisting phonemes can merge or become zero; new phonemes can be added, and the minimal pairs that are used to justify these phonemes can be added to the lexicon of the language. Constraints on occurrences of features in the structure of onset, nucleus, and coda can be taken over from one language to another and can even be implemented in non-borrowed lexical items. Stress and intonational patterns can be added to or simplified. Tonogenesis and the loss of tone can both take place.

Kang (2011) is a recent and partly diachronic review of the literature on loanword adaptation, and her paper provides a typology of adaptation strategies and a summary of current theoretical challenges. Maddieson (1988) is another important cross-linguistic study that concentrates on the borrowing of sounds to help fill preexisting gaps within a language's phonological system; much of the work on this topic has been carried out as

part of more broadly conceived studies of contact-induced change in individual languages.

(p. 76) Not only can sounds from new words from other languages be incorporated as allophones or even phonemes into the recipient language, or can lead prior allophones to be promoted to phonemic status (as can be said to have happened with /v ð z/ in Middle English; in addition, kinds of syllabic templates can also be transferred. Furthermore, phonological rules or restrictions can be taken over from one language system to another. Transfer of features can transcend the adoption of segments and syllabic or other phonological templates; suprasegmental features can be borrowed. For example, many languages that were previously non-tonal have developed partial or full lexical tone systems as a result of contact with speech communities where these are in use. Thurgood (1999) demonstrates this for the originally non-tonal Chamic language Tsat, which has been strongly influenced by Hlai (Kra-Dai) and Hainanese Chinese (Sino-Tibetan), both of which are robustly tonal.

This last development shows that the influence of one language upon another is not confined to the transmission of material that is added to the store of another language. Callaghan (2014) shows that some borrowed phones, from Hill Patwin (Wintun), Wappo (possibly Yukian or else an isolate), Eastern Pomo (Pomoan), and later on Spanish, which together have doubled the size of the consonantal inventory of Lake Miwok in central California (and which have added some distinctive features to the language's phonology), have begun to be used in words that have derived from Proto-Miwok. A similar state of affairs is reported by Ozanne-Rivierre (1994) for Fagauvea of Uvea, New Caledonia, a Polynesian Outlier that has absorbed many vocalic and especially consonantal sounds from the more prestigious neighboring Oceanic but non-Polynesian language Iaai, some of which have passed into the most high-frequency morphemes in the language.

It should also be recognized that although linguistic systems will be altered by contact-induced change, this change may take the form not of addition of an element, but of the deletion or loss of an element, in order to increase the degree of isomorphism between the phonological system of the donor language and that of the less dominant recipient language. Again, Lake Miwok is relevant here; other Miwokan languages have two central vowels /ə, ɨ/ but Lake Miwok has only /ə/; the Californian languages that helped shape it and which provided it with a lot of loan lexicon (Hill Patwin, Eastern Pomo, Southeastern Pomo, and Wappo) have five-vowel phonemic systems /i, e, a, o, u/, and Lake Miwok has all these, too (Callaghan 2014).

Similarly, Garifuna, one of the languages in the small sample for the case study in the next section, has modified its previous three-series stop system (which, for instance, contrasted /t^h t d/) by merging aspirated and unaspirated voiceless stops, since these kinds of stops are not distinguished phonemically in Kari'na, Spanish, English, and Antillean Creole French, the languages that have shaped Garifuna so much. Maltese, as a North African Arabic variety, once had a series of emphatic coronal consonants that contrasted phonemically with non-emphatic equivalents, as they still do in other Arabic varieties, but

this distinction was resolved in favor of the non-emphatic coronals as a result of massive borrowing from Sicilian and Italian (Borg and Azzopardi-Alexander 1997).

(p. 77) 3.2 A Small Crosslinguistic Examination of Borrowed Sounds and Templates

It is clear that some languages have absorbed and assimilated a greater number of borrowed features of different kinds than others have, and that there is at best a weak correlation between the amount of borrowing of basic lexicon and the amount of structural influence on the same language. As with many other instances of contact-induced change, the features of borrowing are best examined by discussing (however briefly or telegraphically) the results of interactions between speakers of pairs of languages, in terms of the transfer of features from an individual donor language or from an individual recipient language. Most contact-induced changes are examples of the addition of rules or features to a preexisting phonological system.

In terms of the bipartite view of contact-induced language change being pursued in this book, we may state that “phonological borrowing” of this sort is in each case an instance of *transfer of pattern* being brought about in a recipient language as a result of *transfer of fabric*. It is rather unusual for a borrowed sound or a borrowed phonological pattern to permeate words in a donor language that have not been borrowed, though such sounds or templates may of course be available to words from subsequent languages entering a donor language. (Prosody may be an exception: examples of surface tone and intonation transfer are discussed later, and similarly, Maghrebi Arabic has absorbed Berber syllabic templates; see Heath 1997 for a discussion of Moroccan Arabic phonology.) Chapters in Kaye and Daniels (eds. 1997) discuss the phonological features (especially segmental ones) of Hindi-Urdu, Berber varieties, and Swahili.

The paper by Maddieson (1986), which discusses borrowed sounds in a range of over three dozen languages from around the world, uses a version of (or draws insights from) distinctive feature theory in order to enable us to categorize the depth and extremity of borrowing of each sound from the donor to the recipient language. The study is confined to consonantal sounds, but there is no reason why this approach cannot also be applied to vowel sounds, and we have done this here. Maddieson recognizes six increasingly intense (one might say, increasingly system-altering) degrees of borrowing of sounds into a recipient language. He takes examples from over forty languages from throughout the world, belonging to a wide range of language families (with some isolates), in order to demonstrate his ideas of the relative ease (or increasing and incremental difficulty) of borrowing sounds. Three of these languages are included in our sample, namely English, Hindi-Urdu (Maddieson concentrates especially on the latter variety), and Standard Swahili. The other languages sampled are Siwi Berber, Tagalog, Acehnese of Sumatra (a sister-language of Tsat), Yapese, Ifira-Mele of Vanuatu, Ngandi of northeastern Arnhem Land, Australia, Pipil of El Salvador, Garifuna of Belize, and Cuzco Quechua. In section 3.3 of this chapter we (p. 78) examine data from Chamorro, like Yapese, Ifira-Mele, Acehnese

and Tagalog an Austronesian language, and one very strongly influenced by Spanish. Chamorro has also been included in larger studies of which this illustration is part, and is included in Table 3.1. All these languages have borrowed at least 10% of their Swadesh list vocabulary (and a much greater proportion of other kinds of vocabulary) from other languages. This sample is discussed further in Grant (2013).

Table 3.1 Borrowed Sounds in Sample Languages, Arranged According to Maddieson's Classes

Language	#1	#2	#3	#4	#5	#6	Total	New Templates
English	ʒ ɔɪ		v z ð				**8**	**-**
Kaldera sh	f z ʒ dʒ			h ï ə			**16**	**CCC-**
Hindi-Urdu		f ʂ ɳ è ò		x ɣ q		ʻ	**37**	**CC-, -CC**
Acehnese	Z	e o f					**7**	**CC-**
Tagalog	e o	f ts ~ c		r			**10**	**CC-**
Chamorro	b d k	e o w		r			**13**	**CC-**
Yapese	dʒ			h			**5**	**V-, -V**
Ifira-Mele			m^w p^w j	l w			**17**	**CC-, -C#**

Ngandi	nh lh (lamino dental)						**2**	**-**
Pipil	o	b d g f		r			**17**	**CC-**
Garifuna	p o						**2**	**(CC)**
Cuzco Quechua		ph th ch kh qh p’ t’ c’ k’ q’ b d g					**26**	**CC-**
Berber varieties	sʕ dʕ x (p v)			ħ q ‘			**15–17**	**-**
KiUngu-ja		x ɣ θ ð		r			**12**	**CC-**

Notes: CC- indicates a complex onset with two initial consonants, CCC- one with three. (CC) means that very few instances of CC- occur in the language; -C# is a coda-final consonant.

Maddieson scores each borrowed sound in each recipient language separately, according to which of the six categories of borrowing it belongs. The six classes that Maddieson describes in his paper are broadly incremental or hierarchical in nature, such that a Class 2 sound represents a greater change from the status quo than a Class 1 sound does, and the details are given in the following. In Maddieson's paper the concepts of place and manner of articulation are especially important.

In Class 1 we see that the borrowed sound already has a counterpart in the recipient language in regard to place of articulation and that it already has another sound as counterpart with regard to the manner of articulation. Thus a language that already possesses /v/ and /s/ will be open, ceteris paribus, to the borrowing of /z/ because both (p. 79) its place and manner of articulation are already represented and employed in the recipient language. This would account, for example, for the (late) borrowing of /p/ into Kabyle via loans from French, as Kabyle already had /b/ and /f/ at its disposal.

In Class 2 we can see that the borrowed sound introduces a new manner of articulation to the phonological system of the language. For example, a language with only voiceless stops plus voiced nasals may also borrow voiced stops, as is the case in Cuzco Quechua, which has done this feat of borrowing of manners of articulation of stops for three such manners. In Class 3 it is found that the sound in question is promoted within the language from being an allophone to a full-fledged phoneme. This is so with the voiced fricatives /v z ð/ in Middle and Modern English, which were promoted to phonemic status from an allophonic status in Old English.

Maddieson classified the first three groups as affecting "close segments"; in his view, the remaining three groups of sounds, Classes 4 to 6, involve the adoption of what he calls "remote segments" (which are segments that are new to the language systems in question). In Class 4 we may note that the sounds in this class involve the borrowing of new manners of articulation (for instance, voiced stops), which may not have preexisting voiced nasals at every stop. In this regard it differs from the kind of sound borrowing that counts as Class 2, but Maddieson makes it clear that on occasion the same borrowed sound can belong to more than one class.

In Class 5 we find that the borrowed sound has introduced a new place of articulation to the phonological system of the language. Indeed, Maddieson cites the borrowing of the (voiceless) post-alveolar sibilant into Hindi and Urdu as an example of this, as the post-alveolar place of articulation was not previously used in the language.

Finally, and most dramatically, in the case of Class 6 the kind of borrowing that is involved is one in which the borrowed segment introduces both a manner and a place of articulation that was hitherto not used in the language. Maddieson points out that the borrowing of the glottal stop from Arabic into Hindi-Urdu is an example of a borrowing within Class 6. (Maddieson also refers to the use in Hindi-Urdu of a voiced uvular approximant, a sound about which my sources on the language, however, are silent, so I have not discussed it here, though the sounds represented as /x ɣ/ are often articulated as uvular

rather than as velar sounds and thereby align with the borrowed uvular stop /q/ rather than with the inherited voiceless unaspirated velar stop /k/.)

It is apparent that the number of examples of borrowed segments grows fewer and fewer when one moves from Class 1 onward through to Class 6. Table 3.1 indicates the number of sounds in each language in each of the six classes (these are marked as #1 to #6; each sound is counted only once, and if poised to belong to more than one class, it is assigned to the class with the lowest number). Given the increasing remoteness of the six classes, we may notionally award points on a system that scores each Class 1 sound with one point, each Class 2 sound with two, and so on. For what (if anything) they are worth, we provide the total number of points in the penultimate column.

The overall position of the borrowed sounds in the phonological systems of the languages being surveyed is one of marginal status in these systems, and of these (p. 80) sounds being characteristic of loans in the languages in question. With the exception of the case of the "promotion to phonemic status" of the voiced English fricatives, which falls under Class 3, few of them have permeated the outer core of borrowings deeply enough for them now to be used as phones in inherited words in the languages observed. (Even so, some of these sounds may be available for use in borrowed words deriving from loan strata that entered the language subsequent to those which provided the borrowed sounds.) These are sounds that are still preeminently found in the borrowed words which introduced them into the respective language systems, and that is where in general they have stayed.

3.3 Loan Phonology and Distinctive Feature Theory

In this regard it is worth examining the extent to which new distinctive phonological features (of the kind discussed, for example, in Jakobson, Fant, and Halle 1961 or Ladefoged 1886) have been added to the roster of a language's features as a result of borrowing morphs. Jakobson set up some two dozen such features. Although some languages in the sample have not borrowed any fresh distinctive features (this seems to be the case with English, Ngandi, and Garifuna, though all three have borrowed individual sounds), a number of such phonological features can be shown to have been borrowed or transferred in some of the languages in the sample. By contrast, several of the more frequent distinctive features, such as [+ anterior], [+ continuant], [+ nasal], if not universal linguistically, are nonetheless found in all the languages in the sample and in many others besides.

Pipil may have borrowed certain classes of sounds, such as rhotics, but it has not borrowed new distinctive features per se. Some speakers of Tagalog have borrowed [del rel] by acquiring *č* from Hokkien, English, and Spanish words. Ifira-Mele has (re)acquired the feature [+ lateral]; its ancestor, Proto-Polynesian, used both *l and *r, which merged as /r/ in Ifira-Mele. Although plosive sounds containing [+ constricted glottis] (that is, ejectives) and [+ spread glottis] (in other words, aspirated plosives) both appear to be sets of bor-

rowed segments in Cuzco Quechua, only the former can be regarded as a borrowed distinctive feature, since /h/ occurs in native Quechua words such as *hatun* 'big' but /ʔ/ does not occur in Cuzco Quechua at all. The feature [+ constricted glottis] is also borrowed into Acehnese and Urdu, in both cases via loans from Arabic, though in neither is it frequent. In contrast with Cuzco Quechua, Kalderash contains many inherited words that feature voiceless aspirated plosives containing [+ spread glottis] but the sound *h* on its own seems to be almost completely confined to borrowed words. Urdu also borrowed [+ uvular] via loans from Arabic, as have the various forms of Berber that have been examined here, though the latter already possessed continuant pharyngealized sounds. One can say that [+ spread glottis] has also entered Yapese through loans from Japanese and English. KiUnguja (p. 81) originally acquired [+ rhotic] from Southern Cushitic languages (-*zuri* 'good') and has added massively to its frequency by borrowing many words containing it, especially from Arabic and European languages.

The vocalic feature [+ mid] is probably borrowed from Mon-Khmer languages into Acehnese, whence it spreads via sound change into inherited words, while it entered Tagalog through loans from Spanish (and later English), with perhaps some impetus from Kapampangan, which developed *e* and *o* from earlier *ay* and *aw* (as entries in Forman 1973 show when compared with their cognates in Tagalog). It may also have been borrowed from Spanish into Chamorro, as mid-vowels are now phonemic in Chamorro.

Hindi-Urdu has reacquired the feature [+ distributive] because of the borrowing or rather re-borrowing of voiceless (and, very marginally, also voiced) post-alveolar sibilants in words from Sanskrit, Arabic, Persian, and English. This feature probably existed in Hindi's Indic forebear, but it was lost when the three voiceless sibilants of Sanskrit were merged into one sibilant in later forms of Indic languages, usually as /s/.

3.3.1 A Note on Borrowed Templates

The number and variety of templates in a language can also be increased by borrowing, and often is. The preceding data set provides several examples of these, and even a few in which "borrowed" templates leach slightly into native lexicon, and in most cases we can probably find examples of consonant clusters (onsets and or codas) that add to the set of consonantal clusters already available in the language, but not to the range of types of new template. English, Ngandi, and Berber varieties do not instantiate any examples of borrowed templates, unsurprisingly given the range of templates (and especially the range of complex codas) that were already available in the inherited lexicon.

The type of template most frequently borrowed is that of the complex consonantal onset involving the borrowing of CC- or occasionally CCC- onsets. This is most marginal in Garifuna, occurring only in recent loans from English and Spanish, and in Acehnese this kind of cluster, born out of the loss of medial vowels in CVC- onsets, is inspired by Mon-Khmer syllabic structure, but is also found in inherited words (Thurgood 1999), since Mon-Khmer languages with complex onsets, sesquisyllabic structures, and rich vowels systems that include several centralized vowels came into contact with a Malayo-Chamic variety

which had four vowels and a restricted range of templates (V, VC, CV, CVC). Kalderash CCC- syllables are from European loans (*strefjal* 'lightning is flashing' from Greek). CC- and -CC in syllables in Hindi-Urdu are found in loans from Sanskrit (this is true of both onset and codas, though Sanskrit did not have complex codas; in Hindi they occur in sanskritisms that have been denuded of their inflectional endings) and English, while -CC codas are also found in Persian and Arabic loans. CC- onsets, from Arabic (*starehe* 'watch out!') but also found in English loans, are rather rare in KiUnguja Swahili, while in Ifira-Mele they (p. 82) typify loans from South Efate or Bislama or its major lexifiers, French and English, while geminate initial consonants are also found as a secondary development in Ifira-Mele as the result of the deletion of vowels in CVC- sequences in which both consonants are identical. CC- clusters in Tagalog, Chamorro, Pipil, and Cuzco Quechua have come in with loans from Spanish, and few Spanish loans into these languages have their clusters broken up with svarabhakti vowels.

Vowel-initial and vowel-final words in Yapese were previously confined to a small number of function words, and borrowed items in Yapese that were vowel-initial in their source languages were furnished with word-initial and word-final glottal stops (written <q>). This is true of loans from Palauan, Trukic, Polynesian, Spanish, Latin, and German, and some loans from Japanese and English, but later loans from Japanese and English can now begin with vowels.

3.4 Contact-Induced Change and Suprasegmentals

Several suprasegmental patterns have attracted considerable attention in the language contact literature; see Salmons (1992) for an overview. The most striking of these is *tonogenesis*, the set of processes by which a language that previously lacked lexical tone develops a tonal system. Tone must be treated with extreme caution in linguistic reconstruction, because it is said to diffuse easily across families, as well as emerging in isolation (Campbell 1997: 347; Matisoff 2001). Suprasegmentals also appear to be a notable exception to the general rule that the transfer of phonological patterns is the result of transferring lexical material; numerous contact-induced suprasegmental changes are found in the near-absence of loanwords. There are even changes that appear to be contact-induced but cannot easily be classified as transfers, because they do not reproduce patterns found in any of the source languages.

An example of borrowing suprasegmental features without borrowing more than a few loans from one language to the other can be found in varieties of English spoken in Wales. Features such as the lengthening of many medial consonants before vowels (and sometimes before consonants also) in Welsh English echoes a subphonemic feature that is found in Welsh (which only has /nn/ and /rr/ as true geminate consonants opposed by /n/ and /r/) and which has been carried over into varieties of English that are often spoken by

people who know no Welsh and who have lived in areas that have been monoglot in English for many decades (Penhallurick 2004 gives details).

As with other contact-induced sound changes, loanwords are, nonetheless, an important vehicle for prosodic transfer. Fixed initial stress became the rule in Czech due to intense contact with German, but was lost in English due to heavy borrowing from French and Latin (Berger 2016; more examples in Salmons 1992: 43). A combination of internal and external factors was probably responsible for the development of (p. 83) lexical tone in Southeast Asian and Hainan Chamic languages (Thurgood 1999: 232; cf. Kingston 2011: 2317). Conversely, tone has been lost in Wutun (a hybrid of Lingxia Chinese, Tibetan, and Bao'an Mongolian) even in the Chinese vocabulary (Li 1986; Lee-Smith and Wurm 1996). Tone borrowing and loss are also reported in Africa (Salmons 1992: 26–33)—ChiTumbuka of Malawi and most significantly KiSwahili in East Africa would be cases of tone loss—though some of these cases have been questioned (e.g., Nicolaï in press).

Among the Atlantic creoles, perhaps the most extreme example of tonal borrowing is Saramaccan, an English creole spoken in Surinam. This language gives the auditory impression of tone, but unpredictable tonal patterns occur only in vocabulary of African origin, while vocabulary of European origin is more economically analyzed as pitch-accent (Good 2004). A mix of tone and accent occurs in Nigerian Pidgin English and Krio, with some contrastive pairs such as NPE ['mɔ́dà] 'mother' and ['mɔ̀dá] 'school marm' (Faraclas 1984; Finney 2004). There is a recurring (though not straightforward) tendency to associate high tone and etymological stress as a result of contact, not only in the Atlantic creoles, but also English varieties with Chinese substrates (Hong Kong English: Cheung 2008; Chinese Pidgin English: Li, Matthews, and Smith 2005; Stephen Matthews, personal communication, April 23, 2013; cf. Devonish 2002; De Lacy 2006), albeit with some exceptions (Jamaica: Gooden 2003; Trinidad: Drayton 2006; Singapore: Ng 2012). Syllable timing and adjacent stresses are also reported in these varieties, possibly conflating the same phonetic phenomenon (timing: Wells 1982: 572; Mesthrie 2008: 317; stress: Brousseau 2003; Bao 2006).

In addition to word-level prosody, intonation can also be transferred as a result of contact. In some cases, these intonation patterns can be traced to an L1 source with relative confidence. In the Spanish of Buenos Aires and Montevideo, final stressed syllables have a pitch rise followed by a long fall; this pattern has been connected with a strong Italian presence, but is not limited to speakers of Italian origin (Colantoni and Gurlekian 2004; Lipski 2010b: 560). Similar claims are made for Yiddish influence on the intonation of some American English speakers (Weinreich 1956). In India, the high density of pitch accents (especially L*+H) by Indian English speakers has been compared to Gujarati and Tamil intonation (Wiltshire and Harnsberger 2006), though Sangaja (2009: 84) suggests that similar claims with respect to syllable timing have yet to be verified. In Germany, Turkish-German bilinguals use two pragmatically distinct types of rising intonation in both languages, one originating in German (L*HH**%**) and the other (L%H%) in Turkish (Queen 2001).

In many cases, contact-induced prosodic changes cannot be classified as transfer, because they do not reproduce patterns found in any source language. For instance, the word-final high tone in Colloquial Singaporean English (e.g., *àmāzíng*) appears to be a compromise between Southern Min Chinese word-final tone sandhi, Malay phrase-final rising intonation, and Indian English foot-final rising intonation (Ng 2012). In Equatorial Guinea, surface high and low tones are said to be assigned with little regard for stress (Lipski 2010a: 563), whereas Palenquero has been characterized as requiring pitch polarity (Lipski 2010b). Tone can even interact with morphosyntax, as with (p. 84) Papiamentu participles and Saramaccan quantifiers (Rivera-Castillo and Pickering 2004; Kramer 2007).

3.5 Detailed Case Study: Chamorro

The endangered Austronesian language Chamorro (also *CHamoru*), spoken indigenously on Guam and the Northern Mariana Islands (Saipan, Rota/Luta, Tinian) borrowed a massive number of lexical items, including basic words, during its extensive contact with Spanish between first contact in 1521, the establishment of the first Jesuit mission in 1668, and the end of the Spanish American War in 1898. Counts of the percentage of Spanish loans in the total Chamorro lexicon (55%, Rodríguez-Ponga 1995) differ considerably from connected speech or text (20+%, Pagel 2010: 56; ca. 28%, Stolz 1998, 2003). This case study briefly examines phonological adaptation of the Spanish loans and hispanization in the phonology of Chamorro. Blust (2000) points out that /b d/ and onset-initial /k/ also mark borrowed words, as does the very rare /w/ (found only in *wahu* ‘wahoo, kind of fish’), as Chamorro contains layers of loans from (as yet mostly unidentified) Maustronesian languages that influenced Chamorro before the arrival of the Spanish, and also items form Tagalog.

Modern Chamorro has the phonemic six-vowel system /i, u, e, o, a, ɑ/. The literature has stated that Chamorro had the four-vowel system /i, u, a, ɑ/ before Spanish contact (Topping 1973: 23). Blust (2000: 86) wrote:

> In native Chamorro forms, the high vowels *i, u*, and their midvowel counterparts *e*, *o* are *essentially* in complementary distribution, the former occurring in open, and the latter in closed syllables. This distribution was disrupted by the introduction of hundreds of Spanish loanwords, so that it now is more economical to treat *e* and *o* as phonemes. (our emphasis)

We have emphasized the word *essentially* in the preceding to highlight that there are a handful of items of non-Hispanic stock that feature mid vowels in stressed open syllables in Chamorro. In the following, all Chamorro data are taken from Aguon (2009) or Topping, Ogo, and Dungca (1975). The Chamorro orthography follows Aguon (2009).

(1)

Non-Hispanic items with mid vowels in stressed open syllables
/ˈdeʔun/ *deʼon* ‘to pinch’
/ˈke-/ *ke-* (stress-attracting prefix) ‘to try’
/ˈcocu/ *chocho* ‘to eat’
/ˈboʔan/ *boʼan* ‘(to) foam’

Given data such as the items in (1), it appears that Spanish did not introduce stressed mid vowels in open syllables *de novo*. Instead, it seems more plausible that the massive number of loans from Spanish merely increased the frequency of mid vowels in (p. 85) Chamorro. Chamorro vowels are limited to /i, u, a/ in unstressed position. This vowel reduction applies to native Chamorro words and Spanish loans, as is evident in (1) and in many forms in the following. The vowel fronting/*umlaut* alternation fronts initial (stressed) back vowels adjacent to certain particles including the definite article *i* ‘the’ (Chung 1983; Klein 2000). However, not all Spanish roots participate.

(2)

(Non-) participation of Spanish loans in Chamorro *umlaut*
(a) /ˈfogːun/ *foggo*n ‘stove’ < *Sp. fogón*
/i ˈfegːun/ i feggon ‘the stove’
(b) /ˈgoma/ *goma* ‘rubber’ < *Sp. goma*
/i ˈgoma/ i goma ‘the rubber’

Spanish loans are usually fully integrated into Chamorro morphophonology. They participate in reduplication and infixation, for example, but not always in *umlaut*, as the date in (2) (a) versus (2) (b) show.

Topping (1973: 67) advances the generalization that when “Spanish words were borrowed, the pronunciation of them was usually changed to conform to the sound system of Chamorro.” This expresses a pre-theoretical view of “nativization.” Topping (1973) does not always clearly distinguish between pronunciations and spelling; for example, he examines “the Spanish sound *-ll-*.” For phonological purposes, this must be understood as “the Spanish sounds [ʎ] or [j] represented by the grapheme <ll>.” We also need to keep in mind not just modern Spanish, but also the historical varieties of Spanish that the Chamorro population can be assumed to have been exposed to at the time of initial contact and in the extended period thereafter. This method can affect the understanding of the claims made in Topping (1973).

For example, he posits that the “Spanish [s]ound z (in all positions) [changed to the] Chamorro [s]ound s” (Topping 1973). According to Hualde (2005), all Medieval Spanish sibilants had evolved to /s/ in Andalusia and Latin America, that is, in the varieties with which colonial Chamorro would have been in contact. For example, *brazo* ‘arm’ evolved

from /bɾáts͡o/ to /bɾáso/ (Hualde 2005: 159). Given Chamorro *bråsu* /ˈbrɑsu/ ‘arm,’ there is no change in sibilant phonetics to be observed, in contrast to the expectation raised by Topping’s (1973) statement. This form would also indicate that we must indeed look at (Early) Modern, not Medieval, Spanish to make the appropriate comparison with Chamorro. If Chamorro speakers had been exposed to Medieval Spanish, we would expect the affricate /ts͡ʃ/ to appear as its closest equivalent /c/ <ch>. Yet, */brɑcu/ *<brachu> is unattested in Chamorro. This is unsurprising, since the dominance of the Spanish in the Marianas began in the late 1660s, in the Early Modern Spanish period and continued until 1898, although Spanish-Chamorro contacts had occurred sporadically since 1521.

When we systematically investigate the question of how Spanish roots changed when they came into Chamorro, we note an uneasy fit with the notion of “nativization.” Instead, we find four of the puzzling patterns of adaptation identified in Kang’s (2011) survey of loanword phonology: *the too-many-solutions problem*, *divergent repair*, *unnecessary repair*, and *differential importation*.

(p. 86) The grapheme <ll> corresponds to [ʎ] or [j] in Early Modern and Modern varieties of Spanish (Hualde 2005: 180). Chamorro possessed neither the palatal labial nor the palatal semiconsonant; the palatal affricate /ʄ/ appears instead.

(3)

Fortition of Chamorro /ʄ/ < Spanish [ʎ]/[j]
/kabɑʄu/ *kabåyu* ‘horse’ < *Sp. caballo*
/siʄa/ *siya* ‘chair’ < *Sp. silla*
/ʄɑbi/ *yåbi* ‘key’ < *Sp. llave*
/ʄɑnu/ *yåno* ‘level’ < *Sp. llano*

The choice of /ʄ/ over other potential candidates in sound adaptation can be used to illustrate what Steriade (2001) calls *the too-many-solutions problem*. The substituted sound /ʄ/ preserves voicing and palatality of the original *ʎ/j*, but the question is why other available sounds were not used. In particular, the palatal nasal /ɲ/ would have maintained voicing, palatality, and sonorancy, whereas alveolar /l/ would also have preserved voicing and sonorancy and in cases of Spanish input [ʎ] laterality as well.

As far as adjacent vocoids are concerned, only the diphthongs *au* and *ai* occur in native Chamorro words (the word *hagoe* ‘lagoon’ is of unknown origin). Other sequences, including /ia/ and /ea/, have been added from not only Spanish, but also English. On occasion the new sequences are broken up by /h/ (Topping 1973: 68) to supply a syllable onset.

(4)

Variable vowel hiatus avoidance in loan words
/dia/, /diha/ *dia, diha* 'day' < *Sp. dia*
/ispia/, /ispiha/ *espia, espiha* 'to seek' < *Sp. espiar*
/fia/, /fiha/ *fia, fiha* 'to trust' < *Sp. fiar*
/gia/, /giha/ *gia, giha* 'gear' < *E. gear*

The strategy to optionally insert /h/ to avoid vowel hiatus is not available in the native lexical stock in Chamorro. The glottal stop /ʔ/ must be employed here, as shown in the following for the prefixes *mi-* and *ke-*.

(5)

Vowel hiatus avoidance in native words

/ɑcuʔ/ *åcho'* 'rock'	/miʔɑcuʔ/ *mi'åcho'* 'rocky'
/unai/ *unai* 'sand'	/miʔunai/ *mi'unai* 'sandy'
/aca/ *acha* 'to hammer'	/keʔaca/ *ke'acha* 'try to hammer'

The contrast between the data in (4) and (5) reveals a fresh case of what Kenstowicz (2005) called *divergent repair*. The hiatus avoidance through /h/-insertion is available only in loanwords, but not in native words.

The insertion of /h/ observed in the preceding is complemented by a process of /h/-deletion to create vowel hiatus in Spanish loans.

(p. 87) (6)

Variable vowel hiatus creation in loan words
/rikohi/, /rikoi/ *rikohi, rikoi* 'to gather' < *Sp. recoger*
/tiheras/, /tieras/ *tiheras, tieras* 'scissors' < *Sp. tijeras*
/maneha/, /manea/ *maneha, manea* 'to manage' < *Sp. manejar*

The data in (4) and (6) show that we are dealing with an *h/∅*-alternation in Spanish loans overall. Vowel hiatus is tolerated or can be avoided through the insertion of /h/, regardless of whether /h/ or vowel hiatus was present in the foreign etymon. However, this intervocalic *h/∅*-alternation is observed only with loans, not with native vocabulary items in Chamorro.

Whereas Spanish has /a/ as the only low vowel phoneme, Chamorro has front /a/ and the more common back /ɑ/ in stressed position. Thus, we might not expect Spanish /a/ to undergo any change in Chamorro since it appears phonetically (near-)identical to Chamorro /a/. However, Spanish /a/ is regularly backed to Chamorro /ɑ/.

(7)

Low vowel shift of Spanish /a/ to Chamorro /ɑ/
/ˈbrɑsu/ *bråsu* 'arm' < *Sp.* /ˈbɾaso/ *brazo*
/ˈdɑɲu/ *dåño* 'damage' < *Sp. daño*
/ˈlɑna/ *låna* 'wool' < *Sp. lana*
/ˈtɑca/ *tåcha* 'to criticize, blame' < *Sp. tacha*

The preceding examples show stressed low back /ɑ/ surrounded by coronal consonants in Chamorro. This excludes the potential for a coarticulatory effect to favor /ɑ/. The Chamorro adaptations clearly have gone beyond what was given in the Spanish speech signal. Peperkamp (2004) has called this *unnecessary adaptation*. The observed substitution does not replace some sound that the recipient language lacks. Instead, a sound present in both languages appears as a neighboring phoneme in the borrowing language.

Non-geminate syllable codas in Chamorro are restricted to voiceless obstruents and the nasals /m/, /n/, and /ŋ/. Geminates can license voiced obstruents in the Chamorro coda. These coda conditions had a profound effect on Spanish loans.

(8)

Desonorization of Spanish coda liquids
(a) /matkadot/ *matkadot* 'engraver' < *Sp. marcador*
/betdi/ *betde* 'green' < *Sp. verde*
/lugɑt/ *lugåt* 'place' < *Sp. lugar*
(b) /satmon/ *satmon* 'salmon' < *Sp. salmón*
/asut/ *asut* 'blue' < *Sp. azul*
/atkahot/ *atkahot* 'alcohol' < *Sp. alcohol*

The items in (8) (a) and (8) (b), respectively, show that Chamorro did not tolerate Spanish *r* or *l* in syllable-final position and that it regularly transformed both into *t* (Topping 1973: 67f.), preserving only coronality. This fact, which also is found in Chamorro loans into Carolinian (Jackson and Marck 1991), is sharply distinct from the (p. 88) sound's behavior in syllable-initial position. Syllable-initial *l* could appear natively, so its preservation in Spanish loans was predictable. Blust (2000) claimed that *r* did not occur anywhere in native Chamorro (*sirek* 'to masturbate,' a verb that may be an Oceanic loan, cf. Woleaian *siir* 'to drip,' and which has also been borrowed into Yapese, may be an exception). Yet *r* was accepted into Chamorro in syllable onsets, but not in syllable codas.

(9)

Spanish liquids in onsets

(a) /rumot/ *rumot* 'rumor' < *Sp. rumor*
/rubetbit/ *rubetbet* 'revolver < *Sp. Revolver* < English
/riɑt/ *riåt* 'real' < *Sp. real*

(b) /luna/ *luna* 'moon' < *Sp. luna*
/lɑbius/ *låbios* 'lip(s)' < *Sp. labio(s)*
/licera/ *lechera* 'dairy cow' < *Sp. vaca lechera*

The data in (9) (a) and (9) (b), respectively, show that Chamorro included /r/ and /l/ from Spanish in singleton syllable onsets. Remarkably, complex onsets involving liquids from Spanish also appear in Chamorro, even though the native vocabulary does not allow them (Topping 1973: 36f.; Blust 2000; Pagel 2010: 63).

(10)

Consonant-liquid clusters in Chamorro

(a) /bruha/ *bruha* 'witch' < *Sp. bruja*; contrast Tagalog *buruha* 'witch'
/troŋku/ *trongko* 'trunk' < *Sp. tronco*
/primu/ *primu* 'cousin' *Sp. primo*

(b) /plɑnu/ *plånu* 'plan' < *Sp. plano*
/floris/ *flores* 'flower' < *Sp. flor(es)*
/klɑba/ *klåba* 'to nail' < *Sp. clavo* 'nail'

The Spanish input contained three types of novel structures involving liquids: liquids in coda position, rhotics as syllable onsets, and consonant+liquid clusters in onset position. They were dealt with in markedly different ways in Chamorro. Whereas the coda liquids were subjected to native Chamorro coda restrictions, the syllable-initial rhotic and the consonant+liquid clusters were accepted into the borrowing language. This is a case of *differential importation* (Kang 2011). The restriction against *r* was relaxed in onset position. C*l/r* clusters were absorbed without change into the heritage CV(C) syllable template, even though liquids would not appear in syllable codas.

We encounter a number of expected adaptation processes affecting Spanish roots including variable *umlaut*, consonant fortition, and desonorization in syllable codas. Vowel hiatus avoidance or creation through *h/∅*-alternation is puzzling because it diverges from the native model. Low vowel shift is unexpected because there is no phonological necessity for it. Chamorro phonology changed measurably through borrowing from Spanish, including the full set of liquids in syllable onsets, the addition of initial consonant+liquid clusters, the enlargement of possible vocoid sequences, and the increase in the rate of occurrence of mid vowels.

(p. 89) 3.6 The Possibilities of Contact-Induced Phonological Change: The Case of Tsat

The impact of Spanish and other languages upon Chamorro is striking, but some cases are even more dramatic. Tsat (whose phonological history is documented in Thurgood 1999) is spoken in one village near Sanya City in the far south of Hainan Island by a few thousand Sunni Muslims who are largely endogamous and largely bilingual in Minnan Chinese and also often in Cantonese and increasingly Mandarin/Putonghua. Earlier inhabitants of this area spoke Li/Hlai languages, which belong to the Tai-Kadai family and which are still spoken by hundreds of thousands of people in Hainan. These exerted some slight influence on Tsat, which is a migrant language. Tsat is Austronesian, and more specifically a Chamic language, related to Acehnese, Cham, and several other languages of Vietnam, and a little less closely related to Malay (as part of an originally rather conservative Malayo-Chamic branch of Malayo-Polynesian, which a phonology not unlike that of pre-Spanish Chamorro). Speakers of Tsat left northern Vietnam and came to Hainan about 1000 CE. Its closest relative is probably Northern Roglai.

Malay phonology is non-tonal; words are generally disyllabic or longer and use six vowels, of which the mid-vowels are of rather restricted occurrence. The language that underlay Proto-Chamic had a similar system until it came into contact with Mon-Khmer languages in mainland Southeast Asia. The results of this contact (apart from a huge tranche of loanwords, many of which replaced preexisting forms of Malayo-Polynesian origin) included an increase in the number of vowel qualities, especially among mid-level and centralized vowels, increasing use of diphthongs, the concomitant contraction of many disyllables into monosyllables, increasing use of glottal stop as an onset, and the absorption of implosive consonants at labial, dental/alveolar, and often also palatal points of articulation, which contrast with preexisting voiced and voiceless stops. The use of palatal voiceless stops and nasals, embargoed in Malay but widespread in Mon-Khmer, is also permitted in Chamic, as is the use of monosyllabic content words.

Hlai and the Chinese languages are monosyllabic and fully tonal. Malay and most Chamic languages are non-tonal, though some Chamic languages have begun to develop a tonal system (Jarai has low tone on the vowel preceding a final glottal stop) and some others, such as Phan Rang Cham of Vietnam (Brunelle 2012), have gone further than this (Brunelle 2006). In this and other regards Tsat has squeezed itself into the corset of Min Chinese phonology, having already absorbed phonological properties (and much lexicon) from Mon-Khmer languages (and Tsat, like other Chamic languages, contains many other words, many of them both pan-Chamic and monosyllabic, of unknown etymology). Tsat is fully tonal—all its syllables are (p. 90) tone-bearing—and many of its contentives are monosyllabic, though there are many disyllables and trisyllables as well.

The tonology of Tsat has clearly developed in stages much like those of Phan Rang Cham, in which the lowering properties of breathy voice are important for developing a low tone. The features of Tsat tonology resemble those of Hlai and Minnan but are not identi-

cal with either system. Thurgood construes Tsat tones as always being double, comprising two notes drawn from one of five pitch levels. Three tones are level (55 high, 33 mid, and 11 low) and two are mobile, one rising (24) and one falling (42).

There have also been changes in consonantal onsets, in order to accommodate the Tsat words more closely to southern Chinese phonology. The onsets, rhymes, and codas of Tsat are very largely those permitted by Minnan phonology, for instance the use of both aspirated and unaspirated stops in onset position. Other changes have taken place, too; for instance, earlier *j becomes /s/. Stress is a primary consideration in Tsat historical phonology: the numerous monosyllabic forms in Tsat derive their shapes from the primary stressed syllable in Proto-Chamic words, while unstressed syllables often drop away completely.

Changes wrought on Tsat phonology can be seen by comparing some lower cardinal numerals in Tsat, Acehnese, Malay, and English (see Table 3.2; from Thurgood 1999: 38).

Table 3.2 Some Cardinal Numerals in Austronesian Languages

Malay	**Acehnese**	**Tsat**	**English**
satu	*Sa*	*sa33*	‘one’
dua	*Duwa*	*thua11*	’two’
empat	*puət*	*pa:ʔ24*	‘four’
lima	*limʌŋ*	*ma33*	‘five’
tujuh	*Tujoh*	*su55*	’seven’
sembilan	*sikurwəŋ*	*thua11 pa:nʔ42*	‘nine’

3.7 General Conclusions

The overall conclusions that we may come to when we have examined the borrowed phones or phonemes insofar as they are manifested in loanwords in the languages under investigation are threefold:

(1) Borrowed sounds in the various languages rarely penetrate into items in the lexical layers in the recipient language that had existed before the donor language(s) had provided the words through which the recipient language had absorbed its new (p. 91) sounds. Exceptions to this principle include the spread of centralized vowels (and also of Slavic-

style palatalized consonants) into inherited words and older loans in Kalderash Romani (Boretzky 1991).

(2) The corollary is not also true: many languages have resisted the spread of non-indigenous sounds into their language even though they occur in source-language forms of non-indigenous words. We cannot assume that “foreign” sounds are going to be preserved intact in “foreign” words that are borrowed into a given language, even if a large number of words (including relexificational vocabulary items) are taken into the language from that source. Among the languages presented in the sample, this is especially the case with borrowed Kari’na and European words in Garifuna, which have long been very thoroughly assimilated to the original Garifuna phonology, at both segmental and templatic levels. We should not be surprised when phonological borrowing of that kind takes place, but we must not assume that it is going to happen as a matter of course, even if the recipient language contains a great deal of borrowed morphemic material.

(3) There is no particularly sharp correlation between (say) the degree of bilingualism or period of bilingualism in a particular language and the number of borrowed sounds that it has absorbed, and the same is true of the amount of basic vocabulary that the language has replaced by borrowings when contrasted with the number and nature of borrowed sounds. At one extreme Hindi-Urdu has absorbed the greatest number of sounds, and this includes the addition of new places of articulation to its repertoire, while at the other extreme Ngandi has barely taken any borrowed sounds over (and those it has taken are very rare), and the same is true of Garifuna, English, and Yapese. The degree and intensity of contact between these languages also needs to be gauged against the pre-contact typological similarity or otherwise of the languages whose speakers have come into contact. Tagalog and Kapampangan are genealogically related languages and also have very similar phonological systems, so that there was very little scope for the absorption into Tagalog of unfamiliar sounds in Kapampangan words. (However, the sound systems are not identical: the Kapampangan phonemic schwa found no parallel in Tagalog, so that words from Kapampangan containing schwa, written <e> in Kapampangan orthography, such as *pawes* ‘sweat,’ were absorbed in Tagalog with /i/: Tagalog *pawis* ‘ditto.’: Zorc 1993: 205) Those languages that have borrowed the greatest number of sounds have absorbed a great deal of lexicon from languages with very different phonemic inventories from those of the recipient languages.

(4) There are other kinds of phonological feature borrowing that are not attested in the languages in the first data set in the preceding but which are certainly found elsewhere, not least in cases such as Tsat. Two such types of borrowing from donor or source language to recipient language are the beginning of the transmission of patterns of vowel harmony, such as happened in some varieties of Cappadocian Greek that were especially strongly influenced by Turkish (Dawkins 1916), which passed from Turkish-derived forms to being used in inherited Greek forms, and, as previously noted, the development of lexically defined and distinctive pitch tone systems in languages previously lacking them.

(p. 92) In short, here as elsewhere in language, we cannot assume that there will be perfect correlations between the degree of borrowing of core (or non-core) vocabulary from one language to another and the degree of borrowing of unfamiliar sounds in a particular language or across languages.

References

Aguon, K. (ed.). 2009. *The Official Chamorro-English Dictionary/ Ufisiåt na Diksionårion Chamorro-Engles*. Hagåtña, Guam: Department of Chamorro Affairs.

Bao, Zhiming. 2006. Clash avoidance and metrical opacity in Singapore English. *Sprachtypologie und Universalienforschung: STUF* 59(2): 133–147.

Berger, Tilman. 2014. The convergence between Czech and German between the years 900 and 1500. In *Family Effects in Language Contact: Modeling Congruence as a Factor in Contact Induced Change*, edited by J. Besters-Dilger, C. Dermarkar, S. Pfänder, and A. Rabus, 184–198. Berlin: De Gruyter.

Blust, R. 2000. Chamorro historical phonology. *Oceanic Linguistics* 38(1): 83–122.

Boretzky, Norbert. 1991. Contact-induced sound change. *Diachronica* 8: 1–15.

Borg, Albert, and Marie Azzopardi-Alexander. 1997. *Maltese*. London: Routledge.

Brousseau, Anne-Marie. 2003. The accentual system of Haitian Creole: The role of transfer and markedness values. In *Phonology and Morphology of Creole Languages*, edited by Ingo Plag, 123–145. Linguistische Arbeiten. Tübingen: Max Niemeyer.

Brunelle, Marc. 2006. A phonetic study of Eastern Cham register. In *Chamic and Beyond: Studies In Mainland Austronesian Languages*, edited by A. Grant and P. Sidwell, 1–36. Canberra: Pacific Linguistics 569.

Brunelle, Marc. 2012. Dialect experience and perceptual integrality in phonological registers: Fundamental frequency, voice quality and the first formant in Cham. *Journal of the Acoustical Society of America* 131(4): 3088–3102.

Callaghan, Catherine A. 2014. *Proto-Utian Grammar and Dictionary: With Notes on Yokuts*. Berlin: De Gruyter Mouton.

Campbell, Lyle. 1997. Amerindian personal pronouns: A second opinion. *Language* 73: 339–351.

Cardona, George, and Dhanesh Jain (eds.). 2002. *The Indo-Aryan Languages*. London: Curzon.

Cheung, Winnie H. Y. 2008. Span of high tones in Hong Kong English. *HKBU Papers in Applied Language Studies* 12: 19–46.

Chung, Sandra. 1983. Transderivational relationships in Chamorro phonology. *Language* 59: 35–64.

Colantoni, Laura, and Jorge Gurlekian. 2004. Convergence and intonation: Historical evidence from Buenos Aires Spanish. *Bilingualism: Language and Cognition* 7(2): 107–119.

de Lacy, Paul. 2006. *Markedness: Reduction and Preservation in Phonology*. Cambridge, UK: Cambridge University Press.

Drayton, Kathy-Ann. 2006. *Word-Level Prosody in Trinidadian English Creole: A Phonetic Analysis*. Unpublished PhD seminar paper, University of the West Indies: St. Augustine.

Dwyer, Arienne M. 2008. Tonogenesis in Southeastern Monguor. In *Lessons from Documented Endangered Languages*, edited by K. David Harrison, David Rood, and Arienne Dwyer, 111–128. Typological Studies in Language 78. Amsterdam; Philadelphia: John Benjamins.

(p. 93) Faraclas, Nicholas. 1984. Rivers Pidgin English: Tone, stress, or pitch-accent language? *Studies in the Linguistic Sciences* 14(2): 67–76.

Finney, Malcolm Awadajin. 2004. Tone assignment on lexical items of English and African origin in Krio. In *Creoles, Contact and Language Change: Linguistics and Social Implications*, edited by Genevieve Escure and Armin Schwegler, 221–236. Amsterdam; Philadelphia: John Benjamins.

Forman, Michael. 1973. *Kapampangan Dictionary*. Honolulu: University of Hawai'i Press.

Good, Jeff. 2004. Tone and accent in Saramaccan: Charting a deep split in the phonology of a language. *Lingua* 114: 575–619.

Gooden, Shelome. 2003. *The Phonology and Phonetics of Jamaican Creole Reduplication*. PhD thesis, Ohio State University.

Grant, Anthony P. 2013. *The Boundaries of Borrowing*. Unpublished manuscript.

Heath, Jeffrey. 1997. Moroccan Arabic phonology. In *Phonologies of Asia and Africa (including the Caucasus)*, edited by Alan S. Kaye and Peter T. Daniels, 205–217. Winona Lake, IN: Eisenbrauns.

Hualde, J. I. 2005. *The Sounds of Spanish*, Cambridge, UK: Cambridge University Press.

Jakobson, Roman, Gunnar Fant, and Morris Halle. 1961. P*reliminaries to Speech Analysis: The Distinctive Features and Their Correlates*. Cambridge, MA: MIT Press.

Kang, Y. 2011. Loanword phonology. In *Blackwell Companion to Phonology*, edited by Marc van Oostendorp, Colin Ewen, Elizabeth Hume, and Keren Rice, 2258–2282. Malden, MA: Wiley-Blackwell.

Kaye, Alan S., and Peter T. Daniels (eds.). 1997. *Phonologies of Asia and Africa (including the Caucasus)*. Winona Lake, IN: Eisenbrauns.

Kenstowicz, Michael. 2005 The phonetics and phonology of Korean loanword adaptation. In *Proceedings of the 1st European Conference on Korean Linguistics (ECKL 1)*, edited by S.-J. Rhee, 17–32. Seoul: Hankookmunhwasa.

Kingston, John. 2011. Tonogenesis. In *The Blackwell Companion to Phonology*, Vol. IV: *Phonological Interfaces*, edited by Colin J. Ewen, Elizabeth Hume, Marc van Oostendorp, and Keren Rice, 2304–2333. Malden, MA: Wiley-Blackwell.

Kramer, Marvin. 2007. Tone on quantifiers in Saramaccan as a transferred feature from Kikongo. *Synchronic and Diachronic Perspectives on Contact Languages*, edited by Magnus Huber and Viveka Velupillai, 43–66. Amsterdam; Philadelphia: John Benjamins.

Klein, Thomas B. 2000. *Umlaut in Optimality Theory*. Tübingen: Niemeyer.

Ladefoged, Peter. 1996. *The Sounds of the World's Languages*. Oxford: Blackwell.

Lee-Smith, Mei W., and Stephen A. Wurm. 1996. The Wutun language. *Atlas of Languages of Intercultural Communication in the Pacific, Asia, and the Americas*, edited by Stephen A. Wurm, Peter Mühlhäusler, and Darrell T. Tryon, 883–898. Berlin; New York: Mouton de Gruyter.

Li, Charles N. 1986. The rise and fall of tones through diffusion. *Berkeley Linguistics Society* 12: 173–185.

Li, Michelle, Stephen Matthews, and Geoff Smith. 2005. Pidgin English texts from the Chinese English Instructor. *Hong Kong Journal of Applied Linguistics* 8: 79–167.

Lipski, John. 2005. *A History of Afro-Hispanic language: Five Centuries and Five Continents*. Cambridge, UK: Cambridge University Press.

Lipski, John M. 2010a. Pitch polarity in Palenquero: A possible locus of H tone. In *Romance Linguistics 2009: Selected Papers from the 39th Linguistic Symposium on Romance Languages (LSRL), Tucson, Arizona, March 2009*, edited by Sonia Colina, Antxon Olarrea, and Ana Maria Carvalho, 111–127. Amsterdam: John Benjamins.

(p. 94) Lipski, John M. 2010b. Spanish and Portuguese in contact. In *The Handbook of Language Contact*, edited by Raymond Hickey, 550–580, London: Blackwell.

Maddieson, Ian. 1986. Borrowed sounds. In *The Fergusonian Impact: Papers for Charles A. Ferguson in Honor of his 65th birthday*, edited by Joshua A. Fishman, A. Tabouret-Keller, M. Clyne, B. Krishnamurti, and M. Abdulaziz, 1–16. Berlin; New York: Mouton de Gruyter.

Matisoff, James A. 2001. Genetic versus contact relationship: Prosodic diffusibility in South-East Asian languages. In *Areal Diffusion and Genetic Inheritance: Problems in*

Comparative Linguistics, edited by Alexandra Y. Aikhenvald and R. M. W. Dixon, 291–327. Oxford: Oxford University Press.

Mesthrie, Rajend. 2008. Synopsis: The phonology of English in Africa and South and Southeast Asia. In *Varieties of English*, Vol. 4: *Africa, South and Southeast Asia*, edited by Rajend Mesthrie, 307–339. Berlin; New York: Mouton de Gruyter.

Ng, E-Ching. 2012. Chinese meets Malay meets English: Origins of the Singaporean English word-final high tone. *International Journal of Bilingualism* 16(1): 83–100.

Nicolaï, Robert. 2006. A Songhay-Mande convergence area? Facts, questions, frames. *Annual Publication in African Linguistics* 4: 5–30.

Ozanne-Rivierre, Françoise. 1994. Iaai loanwords and phonemic changes in Fagauvea. In *Language Contact and Change in the Austronesian World*, edited by Thomas E. Dutton and Darrell T. Tryon, 523–549. Berlin; New York: Trends in Linguistics, Studies & Monographs 77.

Pagel, Steve. 2010. *Spanisch in Asien und Ozeanien*. Frankfurt am Main: Peter Lang.

Penhallurick, Robert A. 2004. Welsh English: Phonology. In *Handbook of the Varieties of English*, Vol. 1: *Phonology*, edited by Bernd Kortmann and Edgar Werner Schneider, 98–112. Berlin: De Gruyter.

Peperkamp, S. 2004. A psycholinguistic theory of loanword adaptation. In *Proceedings of the Annual Meeting, Berkeley Linguistics Society*, edited by M. Ettlinger, N. Fleisher, and Mischa Park-Doob, 30, 341–352. Berkeley: Berkeley Linguistics Society.

Queen, Robin. 2001. Bilingual intonation patterns: Evidence of language change from Turkish-German bilingual children. *Language in Society* 30(1): 55–80.

Rivera-Castillo, Yolanda, and Lucy Pickering. 2004. Phonetic correlates of stress and tone in a mixed system. *Journal of Pidgin and Creole Languages* 19(2): 261–284.

Rodríguez-Ponga y Salamanca, Rafael. 1995. *El elemento español en la lengua chamorra (Islas Marianas)*. PhD thesis, Universidad Complutense de Madrid.

Salmons, Joseph. 1992. *Accentual Change and Language Contact: Comparative Survey and a Case Study of Early Northern Europe*. Stanford: Stanford University Press.

Sampson, John. 1926. *The Dialect of the Gypsies of Wales*. Oxford: Clarendon Press.

Sangaja, P. 2009 *Indian English*. Edinburgh: Edinburgh University Press.

Steriade, Donca. 2001. Directional asymmetries in place assimilation: A perceptual account. In *The Role of Speech Perception in Phonology*, edited by Elizabeth Hume and Keith Johnson, 219–250. San Diego: Academic Press.

Stolz, Thomas. 1998. Die Hispanität des Chamorro als sprachwissenschaftliches Problem. *Iberoamericana* 70(2): 5–38.

Stolz, Thomas. 2003. Not quite the right mixture: Chamorro and Malti as candidates for the status of mixed language. In *The Mixed Language Debate: Theoretical and Empirical Advances*, edited by Y. Matras and P. Bakker, 271–315. Berlin: Mouton de Gruyter.

Thurgood, Graham. 1999. *From Ancient Cham to Modern Dialects: Two Thousand Years of Language Contact and Change*. Oceanic Linguistics Special Publications 29.

(p. 95) Topping, Donald M. 1973. *Chamorro Reference Grammar*. Honolulu: University of Hawaii Press.

Topping, D., P. M. Ogo, and B. C. Dungca. 1975. *Chamorro-English Dictionary*. Honolulu: University of Hawaii Press.

Weinreich, Uriel. 1956. Notes on the rise-fall intonation contour. In *For Roman Jakobson*, edited by Morris Halle, 633–643. The Hague: Mouton.

Wells, J. C. 1982. *Accents of English*, Vol. 3: *Beyond the British Isles*. Cambridge, UK: Cambridge University Press.

Wiltshire, Caroline R., and James D. Harnsberger. 2006. The influence of Gujarati and Tamil L1s on Indian English: A preliminary study. *World Englishes* 25(1): 91–104.

Zorc, R. David Paul. 1993. “The Prehistory and Origin of the Tagalog People.” In *Language - a doorway between human cultures: tributes to Dr. Otto Chr. Dahl on his nineti-eth birthday*, edited by Oyvind Dahl, 201–211. Oslo: Novus.

Notes:

([1]) Prof. Thomas Benno Klein, an imaginative and inspiring scholar, teacher, and musician, died in November 2014, and his co-authors dedicate this paper to his memory.

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Thomas B. Klein (1964–2014) was Professor of Linguistics at the Department of Writing and Linguistics, Georgia Southern University, Statesboro, Georgia, where he founded the program in linguistics. A phonologist with a PhD from the University of Delaware, he conducted extensive fieldwork on Chamorro in Guam and Saipan, and on Gullah/Geechee in the Sea Islands, South Carolina, and Georgia. His publications include “Umlaut” in Optimality Theory: A Comparative Analysis of German and Chamorro (Tübingen: Niemeyer, 2000).

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E-Ching Ng teaches English linguistics at the National University of Singapore. She received her PhD from Yale University in 2015. Her dissertation, “The Phonology of Contact: Creole Sound Change in Context,” identifies phonetic biases in different types of language contact. Her other research includes stress and tone in Colloquial Singaporean English and its substrates.

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Anthony P. Grant has been Professor of Historical Linguistics and Language Contact at Edge Hill University, UK since 2008. A native of Bradford, UK, he studied at the Universities of York and Bradford, where he gained his PhD (“Agglutinated Nominal in Creole French: Synchronic and Diachronic Aspects”) in 1995. He has published extensively on Native North American languages, Romani, Austronesian languages, pidgins and creoles and English.