GRAMMATICAL CONSTRAINTS OF PHONEMIC MERGER AND PHONEMIC SPLIT IN LOANWORD ADAPTATION

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ABSTRACT

This article presents an illustrative account of the grammatical constraints of phonemic merger and phonemic split: major strategies of the phonological adaptation of Gĩkũyũ loanwords, attested to be derived from English. The terms merger and split are adopted from historical linguistics.

Phonemic merger, the derivation of one reflex from several phonemes, is constrained by the quantitative limitations of the Gĩkũyũ sound inventory, in comparison with English. This is illustrated by means of the adaptation of the fricatives and the central vowels.

Phonemic split, the derivation of several reflexes from one phoneme, occurs in response to the extra-phonetic constraints of the Gĩkũyũ lexical structure: phonotactic, morphological or semantic. The effect of these constraints is exemplified in the modification of the English plosives and the voiced affricate.

1. Introduction

This article is an extract from a study on the phonological adaptation of Gĩkũyũ [yekojo] loanwords, attested to be derived from English (see Mwihaki 1998). Phonological adaptation refers to the strategies and processes, which define the modification of the sound structure, in response to the constraints of the recipient language.

Depending on the unit of focus, three aspects of phonological adaptation can be identified: phonemic, phonotactic and prosodic. These aspects correspond to the function of three analytic units: the phoneme, syllable and phonological word. This article addresses phonemic adaptation.

Phonemic adaptation refers to the context-free rules of sound substitution, which define permissible units and their paradigmatic alternation in the recipient language. Three major strategies of phonemic adaptation are observable: direct phonemic substitution, phonemic merger and phonemic split.

The existing literature generally describes phonemic correspondence (see Anttila 1972, Bynon 1977, Hock 1986). The latter merely affects the features of a given sound, let us say /p/ predictably adapting to /ɸ/, without impinging on its contrastive identity. There is a need to go beyond the level of contrast, to address more differentiated relationships in the form of merger and split.

Merger refers to the derivation of one reflex in the recipient system from several phonemes in the donor language. The converse process defines phonemic split: the derivation of several reflexes from one phoneme. The occurrence of these strategies depends on the grammatical constraints of the individual language.

The case of Gĩkũyũ indicates that merger and split do not occur arbitrarily. They are constrained by specific grammatical factors. Merger arises where Gĩkũyũ functions on a more limited phonemic inventory, in comparison with English. Split occurs in order to accommodate specific properties of the Gĩkũyũ lexical structure and function: phonotactic, morphological or semantic.

To demonstrate the phonetic constraints of phonemic merger, the article discusses the adaptation of the different homorganic sets of the English fricatives (labiodental, alveolar, and palatal), as well as the central vowels. The different sets adapt to the correlatable Gĩkũyũ phonemes: /ɸ/, /θ/, /ʃ/ and /a/, respectively. The constraints of phonemic split are demonstrated by means of the modification of the plosives and the voiced affricate. Homorganicity is given prominence in the treatment of both merger and split.

2. Phonemic merger

Phonemic merger, among consonants, is best manifested in the adaptation of the fricatives. For descriptive expediency, the observable fricatives are examined in three hetero-organic sets: labio-dental, alveolar and palatal.

Two labio-dental fricatives are observed in the English loans into Gĩkũyũ: /f/ and /v/. These fricatives adapt to the only Gĩkũyũ bi-labial fricative: /ɸ/. Thus, a merger results as illustrated below.

(1)   f > ɸ:

form [fɔːm]	>	bomu [ɸomu]
office [ɒfɪs]	>	wabici [waɸiʃi]
chief [tʃiːf]	>	cibũ [ʃiɸo]

(2)   v > ɸ:

vest [vest]	>	bethiti [ɸeθiti]
silver [sɪlvə]	>	thiriba [θiriɸa]
stove [stəuv]	>	thitobu [θitoɸu]

Three dental fricatives are observable in the English lexical correspondences of Gĩkũyũ loanwords. These are /θ/, /s/, /z/. On account of phonemic correspondence, the interdental fricative, /θ/, is preserved. It thereby functions as the regular reflex of the other dental fricatives. This merger is exemplified in the following derivation.

(3)   θ ≡ θ:

thermos [θɜːməs]	>	thamo [θamɔ]
threatre [θɪətə]	>	thieta [θiɛta]
youth [juːθ]	>	yuthi [juθi]

(4)   s > θ:

school [skuːl]	>	thukuru [θukuru]
desk [desk]	>	ndethiki [ndɛθiki]
bus [bʌs]	>	mbathi [mbaθi]

(5)   z > θ:

dozen [dʌzn]	>	ndathani [ndaθani]
gazet [gəzet]	>	ngathĩti [ŋgaθeti]
blouse [blauz]	>	mburaũthi [mburaoθi]

On account of a correlation of the adaptation strategy, the voiceless palatal affricate, /tʃ/, is examined alongside the homorganic fricatives, /ʃ/ and /ʒ/. These obstruents can be subsumed as a sub-class of palatal sibilants (see Hyman 1975; Ladefoged 1982). The voiceless sibilant, /ʃ/, has a phonemic correspondence in Gĩkũyũ. It is therefore preserved, and hence functions as the regular reflex of the homorganic sibilants.

(6)   ʃ ≡ ʃ:

shirt [ʃɜːt]	>	cati [ʃati]
mission [mɪʃn]	>	mĩceni [meʃeni]
brush [brʌʃ]	>	buraci [ɸuraʃi]

(7)   tʃ > ʃ:

|		
butchery [butʃəri]	>	mbucĩrĩ [mbuʃere]
torch [tɔːtʃ]	>	toci [toʃi]
clutch [klʌtʃ]	>	kĩraci [keraʃi]

(8)   ʒ > ʃ:

garage [gæraːʒ]   >   ngaraci [ŋgaraʃi]
                              ↕
                              ngereci [ŋgɛrɛʃi]

Despite the limited occurrence of the voiced sibilant, /ʒ/, the merger depicted above can be considered a logical development. This merger arises because in each case, Gĩkũyũ functions on one and English on several, homorganic sibilants.

Three mergers are illustrated above labial, dental and palatal. These mergers can be represented in the form of diagram, as follows:

(9a) /f/ ⟍   (9b) /s/ ⟍   (9c) /tʃ/ ⟍
           ⟍ /ɸ/   /θ/ ⟶ /θ/   /ʃ/ ⟶ /ʃ/
      /v/ ⟋   /z/ ⟋   /ʒ/ ⟋
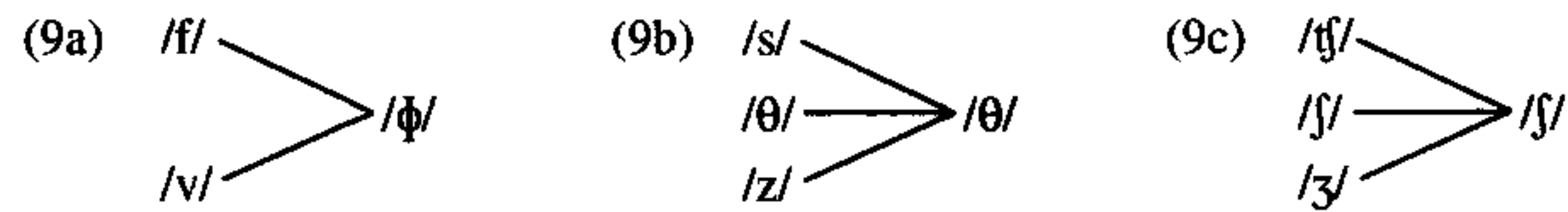
The mergers illustrated above are phonetically conditioned. In each case, Gĩkũyũ functions on one fricative, either /ɸ/, /θ/, or /ʃ/, all three being hetero-organic. In contrast, English depicts sets of two or more homorganic fricatives. The mergers therefore arise to counteract the constraints of the more limited Gĩkũyũ consonantal inventory. A similar constraint is observable in the vocalic merger.

Uncomplicated vocalic merger is best illustrated by means of the adaptation of the English vowels: /ɑː/, /ʌ/, /ə/ and /ɜː/. These vowels regularly adapt to the low, central Gĩkũyũ vowel, /a/.

(10)   ɑː > a

khaki [kɑːki]   >   gaaki [ɣaːki]
guard [gɑːd]   >   ngati [ŋgati]
scarf [skɑːf]   >   thikabu [θikaɸu]

(11)   ʌ > a

lunch [lʌntʃ]   >   ranji [raɲʤi]
summons [sʌmənz]   >   thamanji [θamaɲʤi]
sponge [spʌnʤ]   >   thubanji [θuɸaɲʤi]

(12)   ə > a

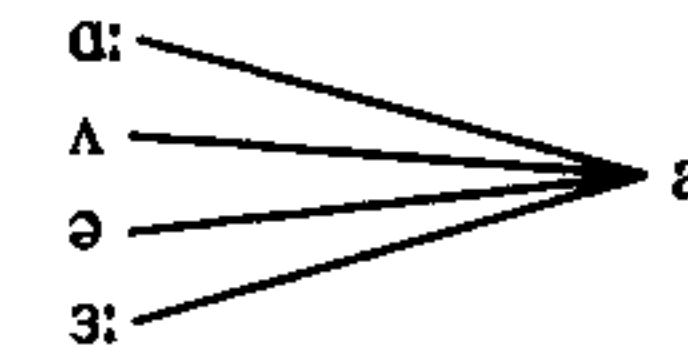machine [məʃiːn]   >   macini [maʃini]
picture [pɪktʃə]   >   mbica [mbiʃa]
cupboard [kʌbəd]   >   kabati [kaɸati]

(13)   ɜː > a

shirt [ʃɜːt]   >   cati [ʃati]
skirt [skɜːt]   >   thikati [θikati]
nursery [nɜːsəri]   >   natharĩ [naθare]

The vocalic merger depicted above can be summarized in the form of the following diagram:

(14)

                 ɑː ⟍
                 ʌ ⟶
                 ə ⟶ a
                 ɜː ⟋

As in the consonantal merger, it can be assumed that vowel position is an important factor: three of the vowels are central, while /ɑː/ shares with /a/ the feature [low].

Once again, phonemic merger is constrained by phonetic needs. While English functions on four vowels in the area, Gĩkũyũ operates on one central vowel. The latter can be considered a natural reflex for the positionally corresponding vowels of English.

The foregoing discussion indicates that phonetic factors are solely responsible for phonemic merger. Merger functions as a strategy for countering the effects of two quantitatively differentiated phonemic inventories. This can be reinterpreted to mean that the recipient language finds a phonetic solution for a phonetic problem.

It is notable that each individual consonantal merger is formed by a homorganic set. Homorganicity is also critical for the derivation of phonemic split.

3. Phonemic split

The motivation of phonemic split is most transparent in the adaptation of the English plosives. On account of a correlation of the adaptation strategy, the voiced palatal affricate, /ʤ/, is examined alongside the homorganic plosives. Four places of articulation are relevant: labial, dental, velar and palatal.

The voiceless bi-labial plosive, /p/, regularly adapts to the homorganic voiceless fricative, /ɸ/. Deviants modify into the bi-labial prenasalized plosive, /mb/. The adaptation of /p/, therefore, derives a phonemic split as follows.

(15)   p > ɸ:

pencil [pensl]   >   benjũ [ɸɛɲʤo]
permit [pɜːmɪt]   >   bameti [ɸameti]
map [mæp]   >   mabu [maɸu]

(16)   p > mb:

pin [pɪn]   >   mbini [mbini]
powder [paʊdə]   >   mbota [mbɔta]
packet [pækɪt]   >   mbagiti [mbaɣiti]

The regular derivation, /p/ > /ɸ/, is attributable to a phonemic correlation. These obstruents share all but the phonetic feature [continuant]. Hence, the Gĩkũyũ fricative /ɸ/ functions as the equivalent of the English plosive, /p/.

The observable deviation is a consequence of morphological nativization (assimilation). The derivatives involved assimilate to the 9–10 nominal classes, otherwise identified as the {N} class of nouns. This means that the relevant words adopt a word-initial {N} marker, prior to homorganic nasal assimilation. The latter process derives the prenasalized form, /mb/.

The prenasalized bi-labial plosive, /mb/, functions as the regular reflex of its oral counterpart, /b/. In other cases, /b/ modifies into the homorganic voiceless fricative or nasal, /ɸ/ or /m/, respectively.

(17)   b > mb:

bus [bʌs]   >   mbathi [mbaθi]
bill [bɪl]   >   mbiiru [mbiːro]
break [breɪk]   >   mburîki [mbureki]

(18)   b > ɸ:

book [bʊk]   >   ibuku [iɸuku]
cabbage [kæbɪʤ]   >   kabici [kaɸiʃi]
cupboard [kʌbəd]   >   kabati [kaɸati]

(19)   b > m:

bisquit [bɪskɪt]   >   mũthigwiti [moθiɣwiti]
bicycle [baɪsɪkl]   >   mũithikiri [moiθikiri]
blanket [blæŋkɪt]   >   mũrĩngĩti [moreŋgeti]

Logically, the regular derivation of /b/ > /mb/ is attributable to a phonemic correlation. The deviation resulting in the derivation of /ɸ/ and /m/, occurs as a result of phonotactic and morphological conditioning, respectively.

Phonotactic conditioning is indicated where the derivation of /b/ > /ɸ/ occurs intersyllabically. This is a weakening position, which results in the softening of the plosive (see Mbugua 1990). The /b/ > /m/ derivation is observable in the words that assimilate to the nominal class coded (3): the nominal class incorporating the {mo} – {me} morphemic markers. This means that the initial syllable of each derivative is morphologized into {mo}. Morphologization is a process which affects all plosives.

Except for one instance: the voiceless dental plosive, /t/, is regularly preserved. The manifest preservation is attributable to the phonemic identity of the English sound with the corresponding Gĩkũyũ form. Preservation is observable as follows:

(20)   t ≡ t:

ticket [tɪkɪt]   >   tigiti [tɪɣiti]
store [stɔː]   >   thitoo [θitɔː]
metre [miːtə]   >   mita [mita]

An exception to this tendency occurs in a /t/ > /k/ derivation, observable in the adaptation of *tractor* [træktə] > *karagita* [karaɣita]. This deviation is a consequence of the morphologization of the initial syllable into the plural marker {to}. The latter is subsequently, replaced by the corresponding singular marker {ka}. The morphemes {ka} – {to} are the markers for the nominal classes coded (12) – (13).

Given the process described above, and the hetero-organic articulation of /t/ and /k/, it can be concluded that the /t/ > /k/ derivation is not phonetically conditioned. As such, this derivation may not be considered an authentic case of phonemic split. Some /t/ derivatives are, however, constituents of the phonemic split of its voiced counterpart, /d/.

The voiced dental plosive, /d/, regularly translates into its prenasalized counterpart, /nd/. Two aspects of deviation are observed. These involve the derivation of /d/ > /t/ and /d/ > /r/, as illustrated below:

(21)   d > nd:

desk [desk]   >   ndethiki [ndeθiki]
drawer [drɔː]   >   ndiroo [ndirɔː]
card [kɑːd]   >   kandi [kandi]

(22)   d > t:

(22a)

powder [paʊdə]   >   mbota [mbɔta]
guard [gɑːd]   >   ngati [ŋgati]

(22b)

padre [pɑːdreɪ]   >   batîrî [ɸatere]
cupboard [kʌbəd] >   kabati [kaɸati]

(23)   d > r:

salad [sæləd]   >   tharare [θarare]
radiator [reɪdieɪtə] >   ririeta [ririɛta]

As in the case of the voiced bi-labial plosive, the prenasalized dental plosive functions as the phonemic equivalent of its oral counterpart. Hence, the /d/ > /nd/ derivation can be considered a logical development. The deviations from this tendency are caused by phonotactic factors, involving three different optimalization conditions: prenasal delinking, post-fricative softening and liquid spreading.

Prenasal delinking is conceived in relation to a dissmilation process. This process blocks the derivation of contiguous syllables, which have prenasalized onsets. This is a regular feature of the Gîkûyû lexicon. Hence the derivation is grammatically conditioned.

A regular strategy of the adaptation process involves the devoicing (softening) of a plosive in the wake of a fricative. This process is conceptualized as post-fricative softening, conditioned by the bilabial fricative, /ɸ/.

The process that translates /d/ into /r/, in the environment of another liquid, can be interpreted as liquid spreading. This development results from hetero-syllabic assimilation, a process comparable to postfricative softening.

Further to structure optimalization, it can be assumed that these procedures are meant to enhance prosodic harmony within the word. They can therefore be appreciated in terms of their aesthetic effect. Aesthetic properties can also be associated with the treatment of the velar plosives.

Most of the occurrences of the voiceless velar plosive, /k/, are preserved. Preservation points to a phonetic identity of the sound in the object languages. Deviants, involving the derivation of the homorganic fricative and prenasalized plosive, are conditioned by phonotactic and morphological factors, respectively.

(24)   k ≡ k:

collar [kɒlə]   >   kara [kara]
class [klɑːs]   >   kîrathi [keraθi]
desk [desk]   >   ndethiki [ndɛθiki]

(25)   k > ɣ:

cotton [kɒtn]   >   gatani [ɣatani]
cake [keɪk]   >   geki [ɣɛki]
coat [kəʊt]   >   igooti [iɣɔːti]

(26)   k > ŋg:

car [kɑː]   >   ngaari [ŋgaːri]
kerchief [kɜːʧiːf] >   ngacibû [ŋgaʃiɸo]

The /k/ > /ɣ/ derivation is attributed to phonotactic conditioning. It is a dissimilation process recognizable as velar softening. In this process, the voiceless velar plosive, /k/, softens into the homorganic fricative, /ɣ/, in the environment of a voiceless obstruent of the body-of-tongue stricture: /t/, /ʃ/, or /k/.

Morphological conditioning accounts for the /k/ > /ŋg/ derivation. The words involved adopt the {N} nominal class marker, prior to homorganic nasal assimilation. The latter process derives the prenasalized plosive /ŋg/.

The velar prenasalized plosive, /ŋg/, is the regular reflex of its homorganic oral counterpart, /g/. There seems little deviation from the norm: one irregular derivation is observable. It concerns the modification of /g/ to the homorganic fricative, /ɣ/.

(27)   g > ŋg:

glass [glɑːs]   >   ngirathi [ŋgiraθi]
gallon [gælən]   >   ngereni [ŋgɛrɛni]
garage [gærɑːʒ] >   ngereci [ŋgɛrɛʃi]

(28)   g > ɣ:

jug [ʤʌg]   >   njagî [ɲʤaɣe]

Perhaps the rarity of deviation is attributable to the fact that /g/, in the English words, regularly occurs word-initially. In this position, /g/ would then automatically modify into the prenasalized counterpart, /ŋg/, and by default, assimilate to the {N} nominal class.

Deviation is observed in a word-final position, where it occurs in the wake of a prenasalized syllable. Similar to the optimalization condition mentioned above, the adaptation process blocks a sequential linkage of syllables having prenasalized onsets, by means of the frication of the plosive.

As mentioned above, the voiced palatal affricate, /ʤ/, behaves like the voiced plosives. Probably on account of phonemic correlation, /ʤ/ regularly adapts to the

homorganic prenasalized form, /ɲʤ/. One deviation is observable, whereby /ʤ/ fricates into /ʃ/.
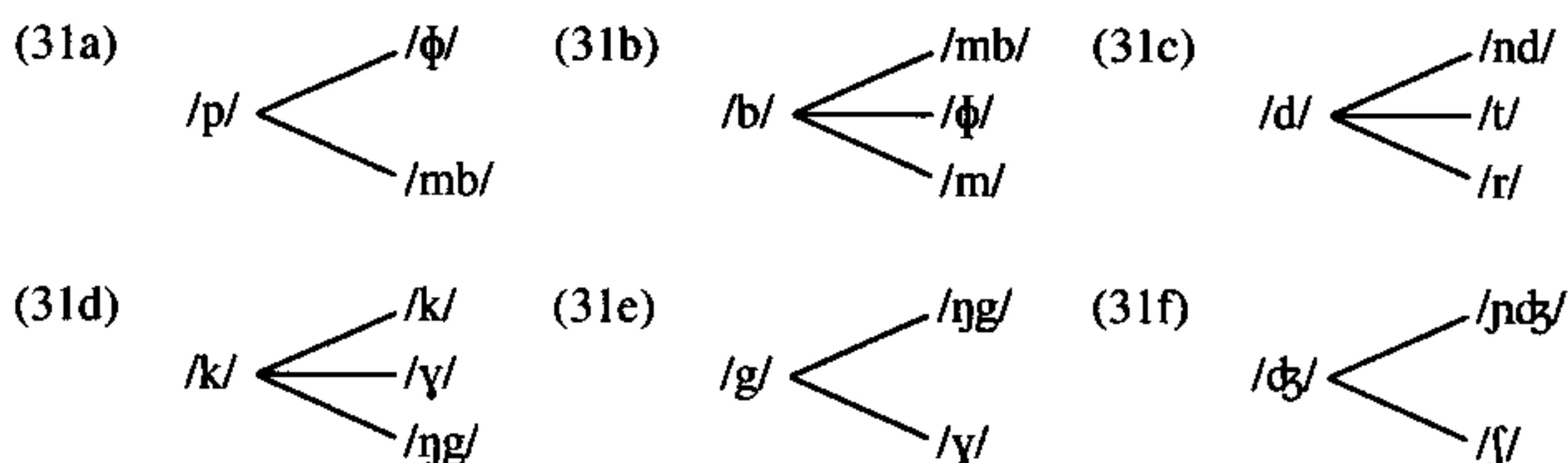
(29)   ʤ > ɲʤ:

major [meɪʤə]	>	mînja [meɲʤa]
page [peɪʤ]	>	bînji [beɲʤi]
badge [bæʤ]	>	banji [ɸaɲʤi]

(30)   ʤ > ʃ:

cabbage [kæbɪʤ]   >   kabici [kaɸiʃi]

Comparable to the voiced plosives examined above, the prenasalized affricate functions as the equivalent of its oral counterpart. Phonotactic relations, resulting in post-fricative softening, condition the deviation. This derivation further validates claims of an aesthetic motivation for some adaptation strategies.

Six cases of phonemic split have been addressed. They can be summarized in the following diagrams. Note that the regular derivative is indicated first.

(31a)   /p/ → /ɸ/, /mb/   (31b)   /b/ → /mb/, /ɸ/, /m/   (31c)   /d/ → /nd/, /t/, /r/

(31d)   /k/ → /k/, /ɣ/, /ŋg/   (31e)   /g/ → /ŋg/, /ɣ/   (31f)   /ʤ/ → /ɲʤ/, /ʃ/

From the foregoing explication, some generalizations can be drawn. Firstly, the phonemic splits are validated on the basis of the fact that the reflexes are homorganic and hence plausible. Secondly, the regular reflex indicates phonetic correspondence. Thirdly, deviants or irregular derivations are constrained by phonotactic or morphological factors.

A phonemic split can also develop from semantic re-analysis. The English word #blue# [blu:], is incorporated into Gîkûyû in its polysemic status. The adaptation process derives two reflexes, #mbururu# [mbururu] and #bururu# [ɸururu], to denote colour and the correlated dye, respectively.

A similar case of semantic re-analysis affects the adaptation of the English word #frame# [freɪm]. This word is introduced into the Gîkûyû lexicon in relation to either picture/photograph or door. The respective derivatives are #burîmu# [ɸuremu]

and #mburemu# [mburemu]. The latter has actually been further reanalyzed to mean 'threshold'.

Phonemic splits arising out of semantic re-analysis, effect a differentiation of the lexical forms without causing drastic changes in the componental sound structure (see Anttila 1972). The modification of /f/ indicates that an individual phoneme can be affected by both merger and split. A multiplicity of strategies is occasioned by competing factors: phonetic versus morphological, or phonetic versus semantic.

4. Summary and conclusions

Two major strategies are observable in the phonemic adaptation of Gîkûyû loanwords: phonemic merger and phonemic split. Both strategies are constrained by language specific grammatical factors.

Mergers arise where Gîkûyû functions on a more restricted phonemic inventory, in comparison with English. The strategy therefore serves a purely phonetic function: it counter-acts quantitative differences in the phonemic inventories.

Splits occur to accommodate different elements of the lexical structure. The regular derivative indicates phonemic correspondence. Deviancy is conditioned by either phonotactic, morphological or semantic constraints.

Besides the formal constraints, an aesthetic motivation probably has a role to play. This is especially assumed to be true of the phonotactic processes, most of which involve heterosyllabic harmony in the form of assimilation or dissimilation.

From these generalizations, several significant conclusions can be drawn:

- Native speakers are intuitively aware of the componental structure, and functional relationships, of the phonemes used in their language.
- The phoneme is a flexible unit, which responds to the various needs of the lexical structure and function.
- Besides the permissible lexical structure, native speakers value the aesthetic effect, which is concomitant with prosodic relationships.

These conclusions have critical implications for the lexical cultivation and modernization of the African languages. The deliberate adaptation of technical terminology for the academic expression, by scholars, should be sensitive to two properties of a word form: the permissible phonological structure and the aesthetic properties.

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