The contribution of language documentation to historical phonology

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Proceedings of Conference on

Language Documentation & Linguistic Theory

Edited by Peter K. Austin, Oliver Bond & David Nathan

7-8 December 2007 School of Oriental and African Studies, University of London

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ISBN: 978-0-7286-0382-0

This paper can be cited as:

Bonny Sands. 2007. The contribution of language documentation to historical phonology. In Peter K. Austin, Oliver Bond & David Nathan (eds) *Proceedings of Conference on Language Documentation and Linguistic Theory*. London: SOAS. pp. 209-219.

or:

Bonny Sands. 2007. The contribution of language documentation to historical phonology. In Peter K. Austin, Oliver Bond & David Nathan (eds) *Proceedings of Conference on Language Documentation and Linguistic Theory*. London: SOAS. www.hrelp.org/eprints/ldlt_24.pdf

The contribution of language documentation to historical phonology

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1. INTRODUCTION[1]

This paper describes how language documentation can directly inform phonological reconstruction by looking at a number of seemingly disparate sound changes involving lateral obstruents in Cushitic, Ju-ǂHoan, and !Ui languages of Africa, based on the author's own fieldwork on Dahalo, ǂHoan and N|uu.

For some (e.g. Gippert, et al. 2006), it would seem that historical linguistics does not play an 'essential' role in language documentation. Books and courses on linguistic fieldwork typically lack sections on historical linguistics (e.g. Bouquiaux & Thomas 1992, Samarin 1967, Newman & Ratliff 2001, Ladefoged 2003) despite the fact that many fieldworkers are historical linguists. Similarly, introductory texts on historical linguistics rarely if ever discuss how fieldwork can affect linguistic reconstructions (even when their authors are noted field linguists, e.g. Campbell 1998, Crowley 1997).

This paper argues that historical linguistics may play an integral role in informing language descriptions, rather than a merely supplemental one. While new data may increase knowledge about historical phonology, linguistic reconstructions may indicate areas which require additional documentation and focused attention. For typologically rare sounds in particular, the increased knowledge about the production and perception of sounds made through impressionistic and instrumental phonetic analyses directly aids in understanding what types of sound changes are more likely than others. Phonological reconstruction, in turn, can play a role in aiding phonetic descriptions and contributing to phonetic theory.

[1] This material is based in part upon work supported by the National Science Foundation under Grants #BCS-0236795 and BCS-0726200. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation. Special thanks also go to Muchuwaiko Tshaidla (ǂHoan), Ali Meno and his sisters (Dahalo), Katrina Esau, Hannie Koerant, Andries Olyn, Anna Kassi, Griet Seekoei, Hanna Koper, |Una Rooi and Kheis Brou (N|uu), Kemmonye Monaka, Henry Honken, Tom Güldemann, Levi Namaseb, Chris Collins, Amanda Miller, Johanna Brugman, Grace Humphreys, Collin Louw, Willem Damarah, Gertruida Sauls, Karen Basson, SASI (South African San Institute), the University of Botswana, Ian Maddieson and Peter Ladefoged.

2. HISTORICAL PHONOLOGY OF LATERAL OBSTRUENTS

2.1. Previous work

The majority of phonological reconstructions involving lateral obstruents involve lateral sonorants or palatals changing into lateral obstruents (Steiner 1977), but there are a few cases in which laterals have been noted as changing into velar or uvular obstruents, e.g. dorsal laterals in Gorokan (Blevins 1994) and tɬ in Northeast Caucasian (Trubetskoy 1922) and Chadic (Ibriszimow 1990).

2.2. This study

Fieldwork and comparative work on Cushitic, Ju-ǂHoan, and !Ui languages supports the existence of a previously unknown sound change mechanism by which dorsal obstruents become lateral obstruents. Documentation of a sound change mechanism by which dorsal sounds become laterals may help account for the presence of languages which have lateral obstruents but no lateral sonorant /l/ (Maddieson 2005) and may also call into question some of the previous reconstructions involving lateral obstruents. These reconstructions suggest that the role of larynx height in the production of click consonants has been not well-enough understood. Fieldwork was key in understanding the sound changes because previous descriptions were either absent or lacking in phonetic detail as to the articulatory properties of the sounds involved.

3. CUSHITIC DATA

Dahalo is a Cushitic language spoken by no more than a few hundred people on the coast of northern Kenya. The presence of a rare contrast between voiceless alveolar and palatal lateral obstruents was not noted in earlier field work on the language (e.g. Ehret, et al. 1989, Tosco 1991, Tucker & Bryan 1977), but is documented in Maddieson, et al. (1993) with acoustic data.

Rare contrasts may be difficult to identify in part because one is not expecting to need to listen for them. Furthermore, in languages with large segment inventories such as Dahalo, rare sounds may occur infrequently in the lexicon, and minimal pairs involving them may be lacking. In cases such as these, diachronic contrasts between segments can support the analysis of a synchronic constrast seen in particular lexical items.

Table 1
Proto-Afroasiatic reconstructions (Orël & Stolbova 1995) and putative Dahalo reflexes (Maddieson, et al. 1993)[2]

Proto-Afroasiatic		Gloss	Dahalo
*l	*ˀal-	'fat, oil'	*ʔáɬi*
*ĉ	*ĉap-	'leaf'	*ʃ̺a:bu*
*ḳ	*ḳaç/*ḳas-	'bone'	*miccʃ̺'o*

Out of our 440 item database (Maddieson, et al. 1993), only 21 items in Dahalo contain lateral obstruents. The alveolar lateral fricative /ɬ/ occurs in 15 words, e.g. *ʔáɬi* 'fat'; the palatal lateral fricative /ʃ̺/ in 2 (*ʃ̺a:bu* 'leaf', *ʃ̺ákane* 'sharp'); the alveolar lateral affricate /tɬ'/ in 2 (*tɬ'a:ʔa* 'lake', *goŋgótɬ'ome* 'ankle') and the palatal lateral (singleton and geminate) affricates /cʃ̺'/ and /ccʃ̺'/ occur in 1 word each (*ʔacʃ̺'ano* 'semen', *miccʃ̺'o* 'bone'). Reconstructions of the lateral for some of these words is shown in Table 1. At least three of the four types of lateral obstruents contrast in their proto-forms and in their synchronic forms.

There is general agreement that the most widespread word for 'bone' in Afroasiatic is reconstructed with some kind of velar initial (with Cushitic forms having an mV- prefix and variable final vowels) (e.g. Ehret 1995, Orël & Stolbova 1995, Jungraithmayr & Ibriszimow 1994, Newman 1980, Arvanites 1991: 170, Bender 2003: 114). The velar in question is generally regarded as some kind of ejective or emphatic. None of these accounts explain why Dahalo has what appears to be a lateral reflex /ccʃ̺'/ of this velar in 'bone'.

The presence of palatal lateral obstruents in Dahalo suggests they may be present yet unidentified in other Afroasiatic languages. Because the classification of Dahalo within Cushitic is controversial (Tosco 2000), the identification of other Cushitic languages sharing the same rare sound change of a velar to a lateral may provide insight into Cushitic subgrouping. Because a sound change supported by one form only cannot be considered a 'regular, repeated sound correspondence', there is an obvious need for further field work documenting lexical items with lateral obstruents in Dahalo (especially ones targeted by looking for reflexes of reconstructed velar ejectives). In this example, we can see that field work may be shaped by historical-comparative linguistic concerns.

4. JU-ǂHOAN DATA

ǂHoan ([ǂhũɑ]) is spoken in Botswana by fewer than 200 people (Batibo 2005). A small amount of lexical data on ǂHoan was collected in Dutlwe, Botswana in a

[2] There is a possible reconstructed form corresponding to one of the words with an alveolar lateral ejected affricate, i.e. **ĉaɬ-* 'lake', *tɬ'a:ʔa* 'lake', but the second consonant correspondence is not regular and this is likely a mere chance resemblance.

preliminary study (Sands, et al. 2005). Previous work on ǂHoan (e.g. Bell & Collins 2001, Gruber 1975) fails to note any lateral obstruents in the language. Familiarity with the voiceless ejective velar lateral affricate [kʟ̝̊'] in isiZulu may have been key in helping me readily perceive [kʟ̝̊'] in ǂHoan in some words (shown in Table 2) which were expected to have a central ejective affricate [kχ'].

Table 2
Comparison of ǂHoan and Proto-Ju (Proto-Northern Khoesan) (based on Sands, et al. 2005, Sands, forthcoming)

ǂHoan	gloss	Proto-Ju	gloss
kʟ̝̊'ɑnokʟ̝̊'ɑno	'boast'	n/a	
kʟ̝̊'ɑqɑ	'soil, sands'		
kʟ̝̊'ɑnɑ	'earth'	***kx'à**	'soil'
kχ'u	'pot'	***kx'ò**	'pot'

Further research is needed to determine whether the lateral ejective velar affricate [kʟ̝̊'] in ǂHoan contrasts with the central one [kχ'] or if it is simply a variant of [kχ'] occuring before the low vowel /ɑ/. A comparison of ǂHoan with Proto-Ju (or Northern Khoesan) reconstructions) is shown in Table 2. Recent comparative work (e.g. Honken 2004) suggests that ǂHoan and Ju languages comprise a ǂHoan-Ju family. This comparative data strongly suggests that ǂHoan, like Dahalo, has developed a lateral obstruent from a dorsal ejective. In some ǀGui and some dialects of ǁGana (Khoe languages), an ejected affricate phoneme /kx'/ also occurs with a lateral fricated release, i.e. [kʟ̝̊'] (Nakagawa 1996: 112). There is no evidence, however, that clicks in ǂHoan and ǀGui with an ejected fricated dorsal release, e.g. /ǂχ'/ have lateral frication.

5. !UI DATA

5.1. Previous work

Clicks, by definition, are made with a dorsal obstruent component. In ǁXegwi, an extinct !Ui language (!Ui-Taa, or Southern Khoesan), Proto-!Ui palatal clicks (ǂ) are never realized as palatal clicks. In some cases, they correspond to palatal and palato-alveolar obstruents, while they correspond to lateral obstruents in others (Traill & Vossen 1997: 41). Traill and Vossen note that this 'is a puzzling change because it does not have an obvious phonetic explanation'. They go on to comment on the moribund state of ǁXegwi at the time it was documented and suggest that 'the irregularities would be an expected feature attending language death'. It is not surprising that palatal clicks undergo some change in ǁXegwi as they seem to be one of the first clicks affected when a language loses clicks (Traill & Vossen 1997). Although sociolinguistic factors may explain why clicks are

under pressure to change (Wilmsen & Vossen 1990), a phonetic explanation is needed to account for the direction of the sound change which takes place.

5.1. Background to this study

Fieldwork on the only extant !Ui language, N|uu, has since been conducted which has provided a modest-sized database (Sands, et al. 2006) which may be compared with ||Xegwi. A recent compilation of ||Xegwi data from published and unpublished sources (Honken 2006) allows for a slightly larger number of ||Xegwi items than were available in the sources used by Traill and Vossen (i.e. Lanham & Hallowes 1956 a, b). The sources differ as to whether they transcribe the ||Xegwi lateral affricates as being alveolar [tɬ', tɬh, dʒ], or velar lateral affricates [kl, klh, kl']. but I concur with Traill & Vossen (1997) that they were most likely velar laterals, i.e. [kʟ̥', kʟ̥^{h}].

Phonetic research on N|uu (Miller, et al. 2007) has helped make it clear that there are different types of palatal clicks in N|uu (and therefore, presumably also in Proto-!Ui). Clicks may be segments made up of a lingual (or 'velaric') airstream mechanism and some phonation type (e.g. ǂ, ǂ^{h}, ᵍǂ, ᵑǂ, ᵑ̊ǂ'/ or they may be linguo-pulmonic (e.g. ǂχ, ǂq, ǂq^{h}) or linguo-glottalic (e.g. ǂχ') airstream contour segments (much as affricates a contour segments for manner). The use of *q* in /ǂq, ǂq^{h}/ is based on Khoesan transcriptional practice and does not indicate a contrastive uvular dorsal constriction for these clicks. Rather, it serves to indicate that, acoustically, these segments are comprised of a click burst immediately followed by a stop burst. The distinction between different N|uu airstream mechanism types based on synchronic phonetic and phonological evidence proves to be useful for diachronic comparison, as will be seen below.

5.2. !Ui comparative evidence for the emergence of some lateral obstruents

As seen in Table 3, ||Xegwi words which have a consonant corresponding to a palatal click in N|uu pattern regularly; they always have a lateral obstruent when N|uu has a lingual palatal, and they always have a central obstruent when N|uu has a linguo-pulmonic palatal click. ||Xegwi appears to have an ejected fricated lateral click corresponding to a linguo-glottalic palatal click in N|uu, though this correspondence cannot be claimed to be regular as it appears in only a single root. Still, the correspondences in Table 3 do not appear to be irregular, but show differences due to different phonetic inputs.

Table 3
Likely cognates in N|uu and ||Xegwi (N|uu data from Sands, et al. 2006, ||Xegwi data from E. O. J. Westphal field notes, as cited in Honken 2006) containing reflexes of Proto-!Ui palatal clicks

Click Airstream	N|uu	||Xegwi
Lingual	ǂui 'egg'	tɬ'wi-ŋ 'egg'
	ǂoro 'moon'	tɬ'oolo 'moon'
	ǂoo 'man'	tɬ'oo 'male gender'
	ᵑǁŋ ǂee 'people'	tɬ'e 'people'
	ǂ'ao-si 'rib'	tɬ'eũ 'ribs'[3]
	ǂ'ĩ 'small, few'	tɬ'ini 'small'
	ⁿǂui-si 'ear'	dɮwi 'ear'
	ǂʰun, ǂʰuŋ 'dog'	tɬhwiŋ 'dog'
Linguo-Pulmonic	ǂqʰoe 'wind'	ʃwee 'wind'
	ǂqoɑ 'pot'	tʃoã 'pot'
	ǂqõe 'short'	tʃwĩĩ 'short'
	ǂqʰɑɑ 'chest'	ʃaa-gu 'chest'
Linguo-Glottalic	ǂχ'oɑ-ke 'pus'	ǁx'wa-ŋ 'pus'
	ǂχ'oɑ-kɑ 'rotten'	ǁx''wa-ɲa 'be rotten'[4]

Forms are shown in Table 3 with hypothesized morpheme breaks to facilitate comparison. N|uu words *ǂ'aosi* 'rib' and *ⁿǂuisi* 'ear' are analyzed as having a singulative marker *-si*. N|uu *ǂχ'oake* 'pus' appears to have the N|uu plural marker *-ke*, and *ǂχ'oaka* 'rotten' has a kind of stative or adjectival marker (cf. */ʰaᶜoka* 'beautiful', */'aaka* 'dangerous'). Morpheme breaks in ||Xegwi are conjectured based upon comparison with N|uu. For instance, *ʃaagu* is most likely composed of *ʃaa* 'chest' + *gu*, (cf. Western N|uu *ᵑǁũicu* 'upper torso', and *ᵑ/ucu* 'nose' vs. ||Xegwi *ŋ/u* 'nose').

There are a few additional !Xóõ (Taa) forms (from Traill 1994) which pattern phonologically like the N|uu forms, i.e. *ǂxūa* 'elephant' (cf. ||Xegwi *tɬ'oò*) and *ǂíi* 'call' (cf. ||Xegwi *cçie*). These items may Proto-!Ui-Taa forms, or early borrowings into !Ui-Taa languages, as they occur in other Khoesan language families.

[3] This vowel correspondence is not repeated, but the forms do appear to be cognate. Two possible cognates suggest a correspondence between /*eũ*/ and /əu/: ||Xegwi *ǁxéũ* 'blood', N|uu *ǁχəu-ke* 'blood' and ||Xegwi cçeuŋ '(rain) falls', N|uu ǂqəu 'rain', but here the cç ~ ǂq consonant correspondence is in doubt.

[4] It is unclear what Westphal meant to indicate by the use of double rather than single apostrophes; 'pus' and 'be rotten' appear to contain the same root.

Checking all N|uu words with palatal clicks for potential cognates in ||Xegwi yielded a cognate set which displays a pattern not attested in Table 3. The nasal lingual click ᵑǂ in N|uu *ᵑǂõˤecu*[5] 'navel, umbilical cord' corresponds to a lateral click in ||Xegwi *ǁo̯e̯'i*[6] 'navel'[7]. A nasal palatal click might be expected to correspond to a nasal lateral affricate, but this is an unattested sound cross-linguistically. It may be that the epiglottalized vowel conditions the reflex in this form (perhaps because of the high position of the larynx in epiglottalized vowels). We have no other examples of voiced nasal palatal clicks in N|uu with cognates in ||Xegwi, and most words with lateral clicks in ||Xegwi directly correspond to words with lateral clicks in N|uu.

5.3. Summary of !Ui sound changes

Three types of lateral obstruents appear to occur in ||Xegwi as reflexes of Proto-!Ui palatal clicks: (pulmonic) lateral affricates /dɮ, tɬh/, an (glottalic) ejected lateral affricate /tɬ'/ (or /kʟ̝'/), and a (linguo-glottalic) lateral click /‖x'', or ‖x'/. As clicks all involve a dorsal articulation, these may be seen as sharing something in common with the sound changes discussed above in Dahalo and ǂHoan.

6. DISCUSSION

6.1. The phonetic mechanism

All of the sound changes discussed involve non-pulmonic (ejectives and clicks) consonants with dorsal constrictions that result in a lateral obstruent, typically a dorsal lateral obstruent. The sound change is limited to the environment preceding low back vowels in (pre-)ǂHoan, and to lingual and linguo-glottalic clicks in (pre-)‖Xegwi.

Dorsal lateral obstruents must be made by the pulling down of the lateral attachments of the hyoglossus muscle. The hyoglossus muscle is attached to the hyoid bone which sits above the larynx, and is thus affected by movements of the larynx. Ejectives are made with a piston-like movement of the larynx, and clicks can also involve a great deal of laryngeal movement because the larynx lowers to give the tongue root more room in the oro-pharyngeal cavity to maneuver when expanding the size of the oral cavity between the front and back click constrictions. Because palatal clicks are released with the tongue root into the pharyngeal cavity (Miller, et al. 2007, Miller, Namaseb & Iskarous 2007), their laryngeal movement seems to be especially large. Previous descriptions of palatal clicks (Ladefoged & Maddieson 1996, Traill 1985) fail to note these articulatory

[5] *cu* was originally a separate morpheme which has been lexicalized onto the root for all but one N|uu speaker, Ouma Hannie Koerant, who distinguishes *ᵑǂõˤe-si* 'navel' and *ᵑǂõˤe-cu* 'umbilical cord'.

[6] The breve diacritic is the closest in Unicode to Westphal's diacritic for pharyngealized/epiglottalized vowels.

[7] Nasalization can be difficult to hear in the context of epiglottalized sounds, so it is possible Westphal failed to hear it in this form.

features of the palatal click. Alveolar clicks [!] rely more on jaw opening and tongue lowering to expand the cavity between the two click constrictions than do palatal clicks [ǂ]. Other click types (/ʘ, ǀ, ǁ/) are fricated and can be released more slowly, with such an abrupt movement of the larynx being less necessary.

The hyoglossus muscle is an antagonist muscle to those involved in raising the back of the tongue, and it is involved in lowering the tongue when the hyoid is fixed (Epstein, et al. 2002). When contracted, the sides of the hyoglossus muscle tend to pull down (Epstein, et al. 2002). Considering this, it seems that dorsal lateral frication is most likely to occur when lowering the back of the tongue from a high position to a low one, such as when moving from a velar to a low vowel. The comparative data suggest it is not a fixed hyoid position that is important so much as a hyoid which quickly moves from a relatively high to a relatively low position (such as when releasing an ejective or a palatal click) which may help condition the lateral frication.

Lingual clicks (e.g. /ǂ, ᵍǂ, ᵑǂ, ǂʰ, ᵑǂ'/) differ from linguo-pulmonic clicks (e.g. ǂχ, ǂq, ǂqʰ) in that they are directly released into a vowel or into a laryngeal (ʔ, h) which does not require any specific supralaryngeal tongue configuration. Linguo-glottalic clicks (e.g. ǂχ') have an ejected consonantal release. The linguo-pulmonic clicks (e.g. ǂχ, ǂq, ǂqʰ) have a click release followed by a pulmonic constriction and release into a vowel. Thus, the movement of the larynx and tongue at the release of a linguo-pulmonic click is different from that of all other clicks, and does not provide the conditions necessary for lateral frication.

6.2. Ekoka !Xung

Ekoka !Xung is the only Ju language to lack palatal clicks. All reflexes of Proto-Ju palatal clicks in this language are realized as a contrastive click type which has not yet been documented phonetically. König & Heine (2001) call it a retroflex click, but Amanda Miller and I hear it as a type of retracted lateral click, distinct from the alveolar lateral click /ǁ/ in the language. Given the examples cited above, this sound correspondence may be the outcome of a conditioned lateralization of some palatal clicks being extended to include all palatal clicks. Our immediate plans for field work in this case have been directly guided by historical-comparative work.

7. CONCLUSION

Recent linguistic documentation of lateral obstruents (and clicks) has proven to be important in helping understand how they pattern diachronically. It has been argued that lateral obstruents may arise through sound changes involving ejective dorsal obstruents and palatal clicks. Because lateral obstruents and clicks are relatively rare, any increase in their documentation can play an especially important role in informing their diachronic phonology.

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