

Khoisan comparative phonology questionnaire: provisional version¹⁾

NAKAGAWA Hiroshi

Introduction

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Introduction

This article presents a questionnaire designed for a typological-phonological research of the cross-linguistic comparison of Khoisan languages (Nakagawa 2013, 2012). Section 1 outlines the procedure for gathering and classifying the relevant lexical items of a target language. For the lexical data-classification, the project will employ the descriptive and analytical device of the Khoisan phonotactic templates, which is introduced in section 2. Section 3 lists questions on the distribution of segments and features within the phonotactic templates. Section 4 presents tonological questions, and section 5 additionally deals with phonological questions on interjections and loan words. To some questions, I add information of the current generalizations on the phonological structures of some Khoisan languages available at this stage. Those provisional generalizations are based on my own field research data of G|ui, G||ana, †Haba and Tshila, and unpublished original field findings generously offered by Christfried Naumann (on Taa languages), Linda Gerlach (on N!aqriaxe) and Anne-Maria Fehn (on Ts'ixa), as well as on my reinterpretations of Beach (1938), Traill (1985), Visser (1998), Haacke (1999), Miller-Ockhuizen (2003), Kilian-Hatz (2008: 21-34).

1. Collecting and organizing the basic lexical data

1.1. Collect basic words by elicitation using the following questionnaires:

- (i) KBA 700-word questionnaire (Naumann 2011),
- (ii) KBA fauna & flora questionnaire (Naumann 2009),
- (iii) G|ui ideophone list²⁾ (Nakagawa 2014).

In the course of data-gathering, you may come across lexemes which are not found in the entries of the questionnaires above. Include them in your basic lexical data unless they are obvious non-Khoisan loan words. New items are welcome.

1.2. Go through the words collected in 1.1, and identify morpheme types and classify them into (i) lexical morphemes (morphological roots or simplest stems) and (ii) other morphemes (e.g. particles, clitics and affixes).

In the course of the morpheme classification, you will see most roots or simple stems following the bimoraic root templates which will be introduced in section 2.1. In a small number of cases, you may find morphologically unanalyzable but phonologically (potentially historically) analyzable morphemes, which fall into the trimoraic templates that will be introduced in section 2.3. You may also find non-derived reduplicated forms³⁾ of which the repeated component follows the bimoraic root templates.

1.3. List the roots or simple stems (according to bimoraic, trimoraic, and non-derived reduplicated forms) and grammatical morphemes (according to their syllabic structure, i.e. CV, N, and others). See section 2.

1.4. Identify obvious non-Khoisan loan roots, exclude them from the basic lexical data and make a separate list for them.

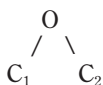
The classified Khoisan roots and grammatical morphemes filtered through sections 1.3 - 1.4 will be the lexical database for the analysis and comparison of the Khoisan Comparative Phonology project.

1.5. List all the forms (words, morphemes, etc.) that cannot be classified in 1.3 and 1.4.

1.6. Identify parts of speech for each root if possible (noun, verb, adjective, adverb, ideophone, conjunction, interjection, adposition, particle, etc.).

2. Khoisan Phonotactic Template

The roots (or simple stems) and grammatical morphemes identified in section 1 will be classified in accordance with the following templates.

2.1. Bimoraic template⁴⁾(i) $OV_1C_mV_2$ (ii) OV_1V_2 (iii) OV_1N Onset (O) may potentially be a cluster: $O \rightarrow /C_1 + C_2/$.

In (ii), V_1 and V_2 can be either different or identical, resulting in the onset phonetically followed by a long vowel, i.e. $[OV:]$.

These three templates apply to most of the roots or simple stems, the ideophones and the components of the non-derived reduplicated forms (see sections 2.4 and 2.5).

2.2. Monomoraic template

$$\begin{array}{c} C_0V_0 \\ N \end{array}$$
2.3. Trimoraic template (combination of 2.1 and 2.2)

$$\begin{array}{l} [\mu\mu]-[\mu]^{5)} \\ [OV_1C_mV_2]-[C_0V_0] \\ [OV_1V_2]-[C_0V_0] \\ [OV_1N]-[C_0V_0] \end{array}$$

$$\begin{array}{l} [\mu]-[\mu\mu] \\ [C_0V_0]-[OV_1C_mV_2] \\ [C_0V_0]-[OV_1V_2] \\ [C_0V_0]-[OV_1N] \end{array}$$
2.4. Ideophonic root template
 OV_iP (P stands for [p, t, k]; V_i stands for vowels occurring in this template⁶⁾.)

 $OV_1C_mV_2$ (identical with 2.1(i))

 OV_1V_2 (identical with 2.1(ii))

 OV_1N (identical with 2.1(iii))
2.5. Template for the non-derived reduplicated form
 $OV_1C_mV_2-OV_1C_mV_2$ (identical with 2.1(i))

 $OV_1V_2-OV_1V_2$ (identical with 2.1(ii))

 OV_1N-OV_1N (identical with 2.1(iii))

3. Occurrence of segments in templates

Q3.1. Are there any roots (or simple stems) and grammatical morphemes that do not fall into any templates introduced in sections 2.1 to 2.4? If there are, list them.

[Current generalization] Virtually all Khoisan morphemes fall into one of the templates in 2.1 to 2.5. (Khoisan morphemes include inter-Khoisan loans.)

BIMORAIC TEMPLATE: ROOT-ONSET AND ROOT-RHYME

The bimoraic root is divided into two parts, namely, the **root-onset** (i.e. O) and the **root-rhyme** (i.e. $V_1(C_m)V_2$ and V_1N).⁷⁾ The root-rhyme constitutes a phonological domain for tone melodies (cf. Q4.1-Q4.4) and nasal harmony (cf. Q3.23-Q3.26).

Root-onset (i.e. O)

Q3.2. What onsets occur in O in 2.1, 2.3, 2.4 and 2.5? Do the inventory of O, and classify all the attested onsets by using the Cross-Khoisan Consonant Chart presented in the appendix.

Q3.3. Do the attested onsets fall within the range of the Cross-Khoisan Consonant Chart (CKCC)? If you find new contrasts in O, list and describe them.

Q3.4. Do the new contrasts, if any, involve (i) the place-of-articulation (i.e. the horizontal axis of the CKCC), or (ii) the series (i.e. the vertical axis of the CKCC)?

Q3.5. In many Khoisan languages, some Os can be analyzed as consonant clusters: i.e. C_1 followed by C_2 . Are there onsets that can be analyzed as clusters? If there are, list them. [Henceforth, C_1 and C_2 stand for the first and second slots of a consonant cluster in O.]

Q3.6. Is C_1 always an anterior (i.e. labial or coronal) stop? (Here the coronal stop includes palatal clicks and non-clicks.) If no, list exceptions.

Q3.7. Is there a difference in frequency in the lexicon between the labial and the coronal stops in C_1 ?

[Current generalization] Frequency of C_1 : Coronal > Labial.

Q3.8. Does C_1 always belong to either the plain or the voiced series? If no, list exceptions.

Q3.9. Is there a difference in lexical frequency between the series in C_1 ?

[Current generalization] Frequency of C_1 : Plain > Voiced.

Q3.10. What phones occur in C_2 ? Do the inventory of C_2 .

Q3.11. Do all the phones occurring in C_2 fall into the uvular/glottal obstruents, such as [q, ɢ, q^h, q', ɢ^h, ɢ', qχ', χ, h, ?]⁸⁾?

Q3.12. Do all the phones occurring in C_2 exist as independent phonemes?

[Current generalization] C_2 falls into the uvular or glottal obstruents, such as [q, ɢ, qʰ, qʷ, ɢʰ, ɢʷ, qχʷ, χ, h, ?], which correlate with the uvular/glottal obstruents attested as independent phonemes, /q, ɢ, qʰ, qʷ, ɢʰ, ɢʷ, qχʷ, χ, h, ?/.

Q3.13. Does C_2 vary in lexical frequency? If it does, state the hierarchy.

[Current generalization]: Lexical and cross-linguistic frequency: /χ/ > /qχʷ/ > others.

Root-rhyme (consisting of V_1 , C_m , V_2 , and N)

Q3.14. What vowel phones are observed in V_1 in (i) $OV_1C_mV_2$, (ii) OV_1V_2 , and (iii) OV_1N ?

Q3.15. Is there evidence for a phonological contrast in vowel height in V_1 ? (E.g. minimal pairs distinguishing between [i], [e] and [a], between [u] and [o], or between [u^ɰ] and [o^ɰ], in V_1 .) If you find the relevant minimal pairs, list them. Note that a minimal pair like [si:] and [se:] is irrelevant here because V_2 in them are different phonemes /i/ and /e/, respectively.

Q3.16. Is there evidence for a phonological contrast in vowel backness in V_1 ? (E.g. minimal pairs distinguishing between [e] and [ə], or between [i] and [i].) If you find the relevant minimal pairs, list them.

Q3.17. Do phonetic diphthongs occur in V_1 in (i) $OV_1C_mV_2$, (ii) OV_1V_2 , and (iii) OV_1N ? (E.g. the rounded vowel phoneme /U/ is always realized as [u^ə]-[u^ə] in V_1 of (iii) OV_1N in G|ui; the rounded vowel phoneme /U/ is occasionally realized as [o^ɰ], [o^ə], etc. Similar diphthongs are observed in V_1 of (i) $OV_1C_mV_2$ in Naro by Visser (1998:131)).

Q3.18. What guttural vowels contrast in V_1 ? Pharyngeal, glottalized, strident, or breathy vowels? List minimal pairs, triplets, etc. for them.

Vowel types potentially occurring in V_1

Modal vowel	V	[- pharyngeal, - glottalized, -breathy]
Pharyngealized vowel	V ^ɰ	[+ pharyngeal, - glottalized, -breathy]
Glottalized vowel	Vʔ	[- pharyngeal, + glottalized, - breathy]
Strident vowel	V̤	[+ pharyngeal, - glottalized, + breathy]
Breathy vowel	V̥	[- pharyngeal, - glottalized, + breathy]

[Current generalization] V_1 involves only non-dorsal distinctive features, i.e. [± round] and [Guttural] ([± pharyngeal], [± glottalized], and [± breathy]). Frequency: [± round] > [± pharyngeal] > [± breathy] (but for South Kua /V̤ V̤^ɰ *Vʔ/ according to Traill 1980).

Q3.19. Are there any constraints on the O-V₁ combination in terms of [uvular/ejective/glottal/aspiration] in O and guttural features in V₁?

Q3.20. Are there any co-articulatory effects of C₁ on V₁ (skipping C₂)? If yes, describe them. Are these effects blocked by C₂? If yes, by what C₂? (cf. Taa exhibits a different C₁-V₁ co-articulation between the [l †] class and the [Ø † l] class in terms of phonological /a/ realized as [e, i]. cf. !q'ee vs. !q'ae, !qχ'ae vs. !qχ'ae.⁹⁾).

Q3.21. What vowels contrast in V₂? Can you establish phonemes other than /i, e, a, o, u, ɪ, ā, ũ/ in V₂?

Q3.22. Are there phonological contrasts between the high nasal vowels [ɪ ũ] and the mid nasal vowels [ē ð] in V₂? If yes, list minimal pairs for them (e.g., [ɪɪ] vs. [lēē], [!āɪ] vs. [!āē]; [lũũ] vs. [lðð], [!āmũ] vs. [!āmð]).

[Current generalization] Nasal vowel phonemes in V₂ are /ɪ, ā, ũ/, with the contrast between high and mid vowels (i.e. [ɪ ũ] and [ē ð]) neutralized?

Q3.23. Is V₂ always non-nasal if C_m is non-nasal?

Q3.24. Is V₂ neutralized in nasality if C_m is nasal?

Q3.25. Is there a phonological contrast between OVC_mi and OVC_mī, or between OVC_me and OVC_mē if C_m is nasal? If yes, list examples.

Q3.26. Are there minimal pairs of OVC_mī vs. OVC_mē and OVC_mũ vs. OVC_mð with C_m nasal? For example, [līmī] vs. [lēmē] (or [limi] vs. [leme]), [līnī] vs. [lēnē] (or [lini] vs. [lene]), [!āmī] vs. [!āmē] (or [!ami] vs. [!ame]); [lũmũ] vs. [lðmð] (or [lumu] vs. [lomo]), [lūnũ] vs. [lðnð] (or [lunu] vs. [lono]), [!āmũ] vs. [!āmð] (or [!amu] vs. [!amo]). (Note that tones do not have to be controlled.) If you find relevant minimal pairs, list them.

[Current generalization] The root-rhyme harmonizes in nasality: If V₂ is a nasal vowel, V₁ is phonetically nasalized; if C_m is nasal, there is no distinction in nasality in V₂ (which is usually phonetically nasalized).

Q3.27. What phonemes occur in C_m? Do the inventory of C_m.

Q3.28. Do the phonemes for C_m vary in frequency in the lexicon? If they do, state their difference in frequency.

[Current generalization] In C_m, /b, r (or l), m, n/ are frequent, /j, w/ are rare, and others are rarer.

Q3.29. What nasal consonants occur in N? Do the inventory of N.

Q3.30. Do the phonemes for N vary in frequency in the lexicon? If they do, state their difference in frequency.

[Current generalization] Frequency of N: /m/ > /n/ > /ŋ/.

Q3.31. Some features may spread across O and the root-rhyme synchronically and diachronically: [+ lateral] from O to C_m in G|ui and G||ana, [- nasal] from the root-rhyme to O in “Northern Kalahari Khoe languages in general, including the entire Khwe group (sans !Ani) as well as part of the Shua cluster and the Tshwa lects Ganadi and Tshwao” (Anne-Maria Fehn p.c.), [Guttural] between O and V₁ in #Haba. Do you find similar feature spreading?

Q3.32. Are there morphophonological alternations in O or C_m? If yes, state them. (See also Q3.43.)

NON-DERIVATIONAL REDUPLICATED FORM

Q3.33. Are there synchronically unanalyzable forms that have reduplicated shapes? (Cf. section 2.5)

Q3.34. If yes in Q3.34, do these forms fall into the templates in section 2.5? List exceptions if any.

Q3.35. Are there similar non-derivational reduplicated forms with a shape of OV₁V₂-OV₁C_mV₂ or OV₁C_mV₂-OV₁V₂? (Note that in such forms, C_m is missing in either the first or the second element.) If there are, list them.

MONOMORAIC TEMPLATE 1: C₀V₀

Q3.36. What consonants (including clusters) occur in C₀? Do the inventory of C₀.

Q3.37. How does the C₀ inventory differ from the O inventory and C_m inventory?

Q3.38. Do non-click consonants occur relatively frequently in C₀ in the lexicon?

Q3.39. What vowels occur in V₀? Do the inventory of V₀. Is it the same as the V₂ inventory?

Q3.40. Does V₀ contrast in nasality? Are there morphemes consisting of the C₀[- nasal] + V₀[+ nasal] sequence, such as /pā, kū, ?ī/ as opposed to /pa, ku, ?i/?

(i) If yes, does V₀ contrast in nasality even if C₀ is a nasal non-click consonant, e.g. /ma/ vs. /mā/?

(ii) If no, is V₀ always [+ nasal] if preceded by a nasal non-click consonant, i.e. [mā, mī, mū, nā, nī, nū] etc., or is V₀ always [- nasal] even if preceded by a nasal non-click consonants, i.e. [ma, mi, mu, na, ni, nu] etc.? Or does the nasality of V₀ show free variation?

Q3.41. Does the V₀ inventory contain guttural vowel phonemes, such as /a^ʕ, u^ʕ, a^ʔ, u^ʔ, a_ʕ, u_ʕ, a_ʔ, u_ʔ? If yes, provide example words.

Q3.42. Are there morphophonological alternations in C₀? If yes, state them. (Cf. ti/te ~ kā, tM~kM in Taa.¹⁰)

MONOMORAIC TEMPLATE 2: \mathfrak{N} (Moraic nasal)

Q3.43. What nasal consonants occur in \mathfrak{N} ? Do the inventory of \mathfrak{N} , and compare it with the nasal consonants in C_m and N in bimoraic root templates.

Q3.44. The nasal segments in the N inventory differ in frequency in the lexicon? If yes, state the hierarchy.

Q3.45. Are there morphophonological alternations in \mathfrak{N} ? If yes, state them.

TRIMORAIC TEMPLATE

Q3.46. Are trimoraic roots phonologically decomposed into a bimoraic template in combination with a monomoraic template? If yes, list them.

Q3.47. If yes in Q3.46, classify the attested trimoraic roots into the $[\mu\mu]-[\mu]$ type or the $[\mu]-[\mu\mu]$ type. What is the evidence for the classification, tonology or phonotactics, or both, or something else?

Q3.48. If yes in Q3.47, which type is more frequent? If $[\mu\mu]-[\mu]$ is more frequent, is the language suffix-predominant, and if $[\mu]-[\mu\mu]$ more frequent, is the language prefix-predominant?

IDEOPHONIC ROOT TEMPLATE

Q3.49. If there are ideophonic roots, are there those falling into the OV_iP template? (Note: P stands for $[p]$, $[t]$ or $[k]$; V_i stands for a vowel occurring in this template, being possibly different from both V_1 and V_0 in the inventory. See Q3.52.).

Q3.50. If yes in Q3.50, list them, and compare the frequencies of $[p]$, $[t]$ and $[k]$.

[Current generalization] Frequency: $[p] > [t]$; $[k]$ is unattested.

Q3.51. If yes in Q3.50, do the inventory of V_i . Is the V_i inventory different from the V_1 and V_0 inventories? If yes, state the differences (e.g. in $G|ui$ the V_i inventory is $/i a o u a^{\text{h}} u^{\text{h}}/$, which is different from both V_1 and V_0 . Unlike V_1 , V_i distinguishes between $/i/$ and $/a/$ and between $/u/$ and $/o/$; unlike V_0 , V_i lacks $/e/$ and $/\bar{i}, \bar{a}, \bar{u}/$).

Q3.52. If yes in Q3.50, is C_1V_iP monomoraic or bimoraic in terms of tonal distribution? (E.g. in $G|ui$, this template has a two-way tonal contrast just like monomoraic morphemes of C_0V_0 or \mathfrak{N} , while the bimoraic roots have a six-way tonal contrast.)

Q3.53. Is there a phonological contrast between $/V/$ and $/\text{?}V/$ in the morpheme initial position? If yes, in what template? (E.g. $G|ui$ has this contrast in C_0V_0 : è <nominative/vocative> vs. ?è <passive>; ò <imperative emphasizer> vs. ?ò <inside>.)

4. Tonology

Q4.1. Are there tonal contrasts in bimoraic roots?

Q4.2. If yes in Q4.1, how many contrastive tone melodies occur in bimoraic roots? Do the inventory of the tone melodies, and give the illustrative examples for the contrastive tone melodies (such as minimal pairs, triplets, quadruplets, etc.).

Q4.3. Are the tone melodies occurring in OV_1N the same as those occurring in $OV_1C_mV_2$ and OV_1V_2 ?

[Current generalization] The tone melodies occurring in OV_1N are the same as those occurring in $OV_1C_mV_2$ and OV_1V_2 . Therefore, the tone bearing unit is the mora, rather than the syllable.

Q4.4. Can the attested contrastive tone melodies be interpreted as consisting of two consecutive level tones, such as HH, LL, HL, LH, etc.?¹¹ If yes, list the tone melodies presented in Q4.2. If you find any problems in interpreting melodies as consecutive tones, state them.

Q4.5. Do the inventory of tones under the interpretation in Q4.4. How many different levels must be represented?

[Current generalization] The tonal contrast may be two-way (/H, L/) as in Taa (Naumann 2008), three-way /H, M, L/ as in G|ui (Nakagawa 2006), or four-way (/extra-H, H, L, extra-L/ or /4, 3, 2, 1/) as in Khoekhoe (Haacke 1999).

Q4.6. Do the tone melodies have gaps in the possible permutations of two tones? (E.g., G|ui has HH, HM, HL, MM, LL and LM, but lacks *MH, *ML and *LH.)

Q4.7. Do the tone melodies vary in frequency in the lexicon? If so, state their difference in frequency.

Q4.8. Does the distribution of tone melodies pattern in accordance with (i) O classes, (ii) V_1 guttural features, or (iii) the template types? (E.g. the voiced obstruents

Q4.9. Do the inventory of the tonal contrasts found in the monomoraic morphemes of the $(C_0)V_0$ and N types.

(i) Does the inventory include any contour tone(s)? If yes, list all morphemes with the contour tone. If no, are the contrastive tonal levels the same as those found in the bimoraic roots in Q4.5?

(ii) Are there toneless monomoraic morphemes, their surface tones being predictable from the adjacent tone (e.g. by tonal assimilation or dissimilation)? If there are, list them with illustration of the relevant rules.

Q4.10. Do the inventory of the tonal contrasts found in the ideophonic roots of the OV_1P type. Does the inventory include any contour tone(s)? If yes, list all morphemes with the contour tone. If no, are the contrastive tonal levels the same as those found in the bimoraic roots in Q4.5?

[NOTE] The monomoraic, C_0V_0 , N , OV_iP , may have the tonal contrast reduction: e.g., G|ui has a three-way contrast in bimoraics and a two-way contrast in monomoraics.

Q4.11. Can the trimoraic roots tonally be interpreted as combination of a bimoraic root and a monomoraic? In other words, do the tone melodies for the bimoraic root followed/preceded by the tones for the monomoraic predict all the tonal patterns observed in the trimoraic roots?

Q4.12. Are there tonal alternations involved in morphophonological processes, such as derivation, conjugation, compound, and the “juncture” construction in some Khoe languages?

5. Miscellaneous

Q5.1. If there are interjections, list them. Are there interjections that exhibit different patterns from other lexical morphemes in terms of the phonemic inventory, phonotactics and tonology?

Q5.2. Analyze the obvious non-Khoisan loan roots identified in section 1.4. Are there loan words that exhibit different patterns from other lexical morphemes in terms of the phonemic inventory, phonotactics and tonology?

Note

- 1) I am deeply grateful to Christfried Naumann, Tom Güldemann, Linda Gerlach and Anne-Maria Fehn for valuable comments on the draft of this questionnaire. Special thanks also to all participants at the 6th KBA CRP meeting for fruitful discussions about the first proposal of this project. This work was supported by JSPS KAKENHI (Grant Numbers 23652082 and 25300029).
- 2) This is not a questionnaire, but its entries can be used for elicitation.
- 3) As opposed to derived reduplicated forms, i.e. the forms morphologically derived from other roots by the morphophonological process of reduplication.
- 4) The lower case “m” in the symbol C_m of (i) $OV_1C_mV_2$ comes from “middle”.
- 5) The (phonologically) suffixal form of CV may occur as a combination, resulting in a “tetramoraic template”, such as $[OV_1C_mV_2]-[C_0V_0]-[C_0V_0]$ (e.g. $g\#?ùb\check{V}$ ‘root’ > $g\#?ùb\grave{I}$ -si ‘a root’, $g\#?ùb\grave{I}$ -kú-tê ‘roots’ in Taa (Christfried Naumann 2014 p.c.).
- 6) The letter “i” in V_i of OV_iP comes from “ideophone”.
- 7) Beach (1938) introduced the same distinction between the two parts, and referred to them as the “initial” for the root-onset and the “final” for the root-rhyme.
- 8) c^h and c' may be realized as $[c^q^h]$ and $[c^q']$ (or $[x^q^h]$ and $[x^q']$), respectively.
- 9) Suggested by C. Naumann (2014 p.c.).
- 10) Suggested by C. Naumann (2014 p.c.).
- 11) Level tone melodies, such as HH, MM, LL, are not necessarily phonetically level, but can be phonetically contours. See Nakagawa (2006) and Naumann (2008).

Appendix: Cross-Khoisan Consonant Chart (Lb=labial, Dt=dental, Al=alveolar, Pl=palatal, Ll=lateral, Vl=velar, Uv=uvular, Gl=glottal, -Af=affricate)

SERIES		Click						Non-click						
		Lb	Dt	Al	Pl	Lt	Lb	Dt	Dt-Af	Pl	VI	Uv	Uv-Af	Gl
Stop segment	1) Plain	⊙	l	!	ʈ	ll	p	t	ts	c	k	q		ʔ
	2) Voiced	g⊙	gl	g!	gʈ	gll	b	d	dz	ʃ	g	g [ʳg]		
3) Voiceless ejective	3) Voiceless ejective	⊙'	l'	l'	ʈ'	ll'	p'	t'	ts'	c'	k'	q'	qχ'	
	4) Voiced ejective	⊙ʰ	glʰ	g!ʰ	gʈʰ	gllʰ	pʰ	tʰ	tsʰ	ʃʰ	gʰ	qʰ	qχʰ	
5) Voiceless aspirated	5) Voiceless aspirated	g⊙ʰ	glʰ	g!ʰ	gʈʰ	gllʰ	bʰ	dʰ	dzʰ	ʃʰ	gʰ	gʰ		
	6) Voiced aspirated	⊙χ	lχ	lχ	ʈχ	llχ		tχ	tsχ	cχ				
7) Plain+χ	7) Plain+χ	g⊙χ	glχ	g!χ	gʈχ	gllχ		dχ	dzχ	ʃχ				
	8) Voiced+χ	⊙qχ'	lqχ'	!qχ'	ʈqχ'	llqχ'	pqχ'	tqχ'	tsqχ'					
9) Plain+qχ'	9) Plain+qχ'	g⊙qχ'	glqχ'	g!qχ'	gʈqχ'	gllqχ'		dqχ'	dzqχ'					
	10) Voiced+qχ'	⊙q	lq	!q	ʈq	llq								
11) Plain+q	11) Plain+q	⊙g	lg	!g	ʈg	llg								
	12) Plain+g/voiced+q	⊙qʰ	lqʰ	!qʰ	ʈqʰ	llqʰ								
13) Plain+qʰ	13) Plain+qʰ	⊙qʰ	lqʰ	!qʰ	ʈqʰ	llqʰ								
	14) Plain+gʰ/voiced+qʰ	⊙q'	lq'	!q'	ʈq'	llq'								
15) Plain+q'	15) Plain+q'	⊙q'	lq'	!q'	ʈq'	llq'								
	16) Plain+g'/voiced+q'	⊙h	lh	!h	ʈh	llh								
17) Plain+h	17) Plain+h	g⊙h	glh	g!h	gʈh	gllh								
	18) Voiced+h	⊙ʔ	lʔ	!ʔ	ʈʔ	llʔ								
19) Plain+ʔ	19) Plain+ʔ	g⊙ʔ	glʔ	g!ʔ	gʈʔ	gllʔ								
	20) Voiced+ʔ	η⊙	ηl	η!	ηʈ	ηll	m	n		ɲ	ŋ			
Nasal	21) Voiced	η⊙	ηl	η!	ηʈ	ηll	m	n		ɲ	ŋ			
	22) Voiceless	ʔη⊙	ʔηl	ʔη!	ʔηʈ	ʔηll	ʔm	ʔn						
23) Preglottalized	23) Preglottalized	ʔη⊙	ʔηl	ʔη!	ʔηʈ	ʔηll	ʔm	ʔn						
	24) Prenasalized		ηgl	ηgl!	ηgʈ!	ηgll!	mb	nd		ɲʃ	ŋg			
Nasal cluster	25) Voiced + χ		ηʃχ	ηʃχ!	ηʃχʈ	ηʃχll								
	26) Voiceless		ʔηʃχ	ʔηʃχ!	ʔηʃχʈ	ʔηʃχll			s	ɕ		χ		h
Fricative	27) Voiced								z	ʒ				

Note on cross-Khoisan consonant chart

The cross-Khoisan consonant chart was originally designed by Güldemann (2001), and its revision was proposed in Nakagawa (2006). This appendix presents a slightly modified current version. A detailed discussion of the latest version will be presented in another occasion.

The final goal of this chart is to show all the attested single and complex consonants that make phonological contrasts in Khoisan languages. At the present stage, it is not yet comprehensive, and in the course of research to be done in the Khoisan comparative phonology project, the chart should be further developed and more comprehensive.

This device is a two-dimensional chart, consisting of 13 extended places of articulation (POA) as the horizontal axis, and 27 series as the vertical axis. In this version, clicks and non-clicks are grouped separately in the horizontal axis for convenience, but they can be cross-classified in terms of POA labels presented in the first row, together with the additional articulatory feature of [apical] (Nakagawa 2006) and acoustic features of [grave] and [compact] (Traill 1997).

Series 12, 14, and 16 can alternatively be interpreted as the voiced stop series in C₁ followed by /q, q^h, q'/ in C₂, e.g. /g!q, g!q^h, g!q'/ for the alveolar click (see Güldemann 2001, Naumann forthcoming). The phonological status of series 25 is suspicious: according to Anne-Maria Fehn (p.c.), voiced nasal click + [χ] attested in Ts'ixa, as well as ||Ani (Vossen 1986), is a reflex of series 12, thus, [ŋ]+[χ] should be interpreted as /|/+/g/.

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「コイサン通言語比較音韻論：調査票」

中川 裕

筆者は、これまでにない広範囲にわたるコイサン諸語を調査対象として、それらの音韻論的構造を最新の1次資料にもとづいて解明し、通言語比較によって汎コイサン語音韻論の類型的プロファイルを浮かび上がらせる調査研究プロジェクトの準備を進めている。この文書は、当該プロジェクトにおける通言語比較の基礎資料を分析・解釈するために考案した指針一覧と質問表からなり、観察と分析のためのツールとしての音素配列論的鋳型と通コイサン子音チャートを含む。

第1節は語彙資料の収集と整備の具体的な手続きを述べ、収集した語彙項目の第1段階の分類の手法を記す。第2節は、分節音および音韻素性と声調ユニットの分布を観察するための音素配列論的鋳型を記述する。第3節は、子音の同定と分布、弁別的素性の鋳型内部における分布の特徴を解明するための質問群を列記する。第4節は、声調の性質（声調メロディの同定、その出現領域、声調を担うユニットの特定、声調の分布、声調の交替）を解明するための質問群を列記する。質問の列記の過程で、質問の主旨（作業仮説）の理解に必要な現時点での一般化に関する情報を適宜記述してある。第5節には、周辺の語彙群として観察が予想される間投詞と非コイサン借用語に関わる質問をあげる。これらは、各言語の音韻論の中核的な構造からは外れる音韻的振る舞いをすることが期待されるが、そこにも、コイサン音韻論的な特色が発見される可能性がある。

付録として、通コイサン子音チャートの最新版を掲げてある。このチャートは、現時点までの予備調査に基づき、コイサン諸語における語根頭に潜在的に現れる可能性のあるすべての子音（あるいは子音複合）を2次的に分類したものである。