Mirage of Gradience in !Xoon vowel raising

Julian Bradfield and Shanti Ulfsbjorninn

U. Edinburgh and Memorial U. Newfoundland

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!Xoon is tonal – ignored today.

I'll use orthography rather than IPA – it's easier (for me) to read.

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Medial C_2 are very simple: **b** [b/v], **w, r/l, y** [j], **ny** [ɲ].

Final **m** [m̩], **nn** [n̩] best treated as V_2.

V_2 are **a, e, i, o, u** and may be nasalized **n**.

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Also, V_1 may be breathy **ah**, glottalized **a'**, breathy glottalized **ah'**, pharyngealized **aq**, strident (epiglottalized) **aqh**, perhaps even **aq', aqh'**.

Back Vowel Constraint

All Khoisan languages have some form of:

'Back consonants (including clicks) are not followed by (phonological) front vowels'

But in !Xoon, some clicks are less back than others, and allow phonetically front vowels . . .

Or is V_1 even specified for [back] ?

'A-raising'

Traill assumed underlying **a**, with several degrees of phonetic raising (and concomitant fronting!).

Let C^+ be **ǀ, ǂ** click (clusters) and coronal stops, C^- everything else. Raising never applies to **aq**.

- ▶ Full: $\mathbf{a} \to [i] \,/\, C_1^+\_\mathbf{i}$. E.g. **ǂ̀ìi** 'steenbook' from **ǂAi**.
- ▶ Moderate: $\mathbf{a} \to [ʒ] \,/\, C_1^+\_\{C_2\mathbf{i}, \mathbf{nn}\}$ E.g. **ǂábi** [ǂʒ́bi]
- ▶ Slight: $\mathbf{a} \to [æ] \,/\, C_1^-\_\mathbf{i}$

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- ▶ Moderate: $a \rightarrow [ɜ] \; / \; C_1^+\_\{C_2i, nn\}$ E.g. **ǂábi** [ǂɜ́bi]
- ▶ Slight: $a \rightarrow [æ] \; / \; C_1^-\_i$

Similarly before [e]. But:

- ▶ Traill (1985) says uvular accompaniments (**ǂq** etc.) block full raising;
- ▶ Lionnet (2018) observes counter-examples in Traill (1994);
- ▶ but some of these disappear in Traill (2018).
- ▶ Moderate raising after C^- in Traill's audio data.

Situation in |Gui (Nakagawa 2010) similar but different.

Analyses

A-raising has had varying analyses:

- ▶ Traill (1985,1994): *SPE* descriptive rules
- ▶ Nakagawa (2010): underspecified V_1 filled by assimilation
- ▶ Bradfield (2014): extending Traill with 'concurrent phonemes'
- ▶ Lionnet (2018): gradient subfeatural gang effects ('teamwork')

Our objective today: no gang effects, no phonological gradience, just elements behaving normally!

Elements

We work in a Backley (2011) style framework (|A, I, U, H, L, ʔ|).

We'll sidestep the issue of elements for clickness: see Polgárdi (2014) and Bradfield (2018) for suggestions.

Key question is which place elements |A, I, U| occur in clicks; we adopt some of Bradfield's (2018) conclusions.

- ▶ All clicks have |U| (owing to the posterior closure).

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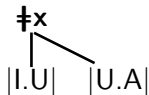- ▶ **ǀ, ǂ** have |I| (from the raised tongue front).

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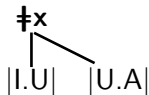
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- ▶ complex consonants have two place nodes under a C slot (Polgárdi 2014):

$$
\begin{array}{c}
\text{ǂx} \\
\diagdown \\
|\text{I.U}| \quad |\text{U.A}|
\end{array}
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Vowels are standard (**i, e, a, o, u** = |I, A.I, A, A.U, U|), with standard manners (**n, ', h, q** = |L, ?, H, A|).

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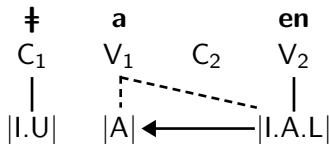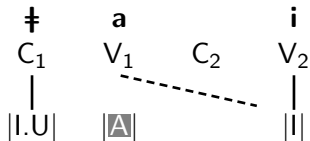▶ Traill's reported [3] comes from *two* sources: either empty V-slot |.| or slot with |A.I|.

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▶ Hence, 'A-raising' is lack of |A|-expression and spreading of |I|.

Traill (1994) has examples such as ‡ài [‡ii] 'steenbok' and ‡áèn [‡eẽ] 'jaw'. These look like:

$$
\begin{array}{cccc}
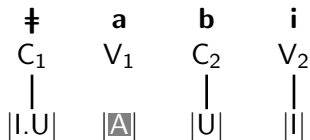\text{‡} & \text{a} & & \text{i} \\
C_1 & V_1 & C_2 & V_2 \\
| & & & | \\
|I.U| & |\boxed{A}| & & |I|
\end{array}
$$

$$
\begin{array}{cccc}
\text{‡} & \text{a} & & \text{en} \\
C_1 & V_1 & C_2 & V_2 \\
| & & & | \\
|I.U| & |A| \longleftarrow & & |I.A.L|
\end{array}
$$

(Note that pharyngealized **aq** has full |A|, e.g. ‡àqin-‡aqin 'barking gecko' [‡aˤĩ].)

Where C_2 exists, |I|-spreading is blocked.

ǂábi [ǂɜbi] 'young steenbok':

$$
\begin{array}{cccc}
\textbf{ǂ} & \textbf{a} & \textbf{b} & \textbf{i} \\
C_1 & V_1 & C_2 & V_2 \\
| & | & | & | \\
|I.U| & |A| & |U| & |I|
\end{array}
$$
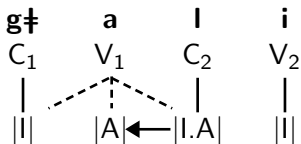
empty V-slot realized as neutral vowel

But if C_1 and C_2 have |I|, plateau effect links |I| to V_1, which optionally triggers linking of |A|.

thàya/thìa [$t̪^h$ɜja/$t̪^h$ia] 'work metal'

$$
\begin{array}{cccc}
\textbf{th} & \textbf{a} & \textbf{j} & \textbf{a} \\
C_1 & V_1 & C_2 & V_2 \\
| & & | & | \\
|I| & |A| & |I| & |A|
\end{array}
$$

gǂàli [^{g}ǂɜli] 'dwarf'

$$
\begin{array}{cccc}
\textbf{gǂ} & \textbf{a} & \textbf{l} & \textbf{i} \\
C_1 & V_1 & C_2 & V_2 \\
| & & | & | \\
|I| & |A| \leftarrow |I.A| & |I|
\end{array}
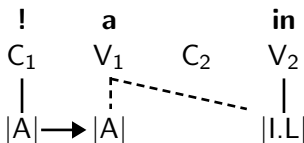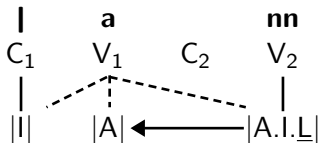$$
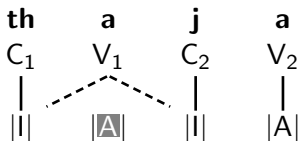
N.B. A plateau effect is not a 'gang' effect: two-sided spreading, not addition of values.

The C⁻ clicks, and all clicks with uvular accompaniments, have
|A|, which licenses |A| in V_1 – hence moderate raising in
!aîn [!ɜĩ] 'stick handle'

!Xoon has no final consonants: -**nn** is [ŋ] in V_2 position. Hence
ǀàńn [ǀɜŋ̩] 'white bauhinia'

$$
\begin{array}{cccc}
\textbf{ǀ} & \textbf{a} & & \textbf{nn} \\
C_1 & V_1 & C_2 & V_2 \\
| & & & | \\
|ǀ| & |A| & \longleftarrow & |A.I.\underline{L}|
\end{array}
$$

!Xoon A-raising is complex, but it can be analysed in ET with normal processes, without resorting to 'teamwork' or gradient phonology.

- ▶ V–V spreading
    - ▶ without A-licensing: $/A/ \to [i] \ / \ C^+\_i$
    - ▶ with A-licensing: $/A/ \to [e] \ / \ C^+\_e$
- ▶ C–C spreading + plateau $/A/ \to [ʒ \sim i] \ / \ C^+\_\{Li, J\}$
- ▶ V–V spreading with A-licensing $/A/ \to [ʒ \sim e] \ / \ C^-\_\{i, e\}$
  $/A/ \to [ʒ] \ / \ C^+\_Bi$
- ▶ C-blocking
- ▶ plateau

Existing work is largely based on Traill (1994), with little audio data, and with just a few (or even one) examples for each context.

There is now a large audio corpus of present-day West !Xoon – unfortunately Bible translations, so limited in vocabulary. It muddies the water – in particular, no examples (so far) of full raising, except after the 'long consonants' **!hh, !"** [!h, !ʔ]. Where do I get six hours of !Xoon transcribed and annotated :–?