Intonation and phonation type as markers in Ikaan Yes/No questions

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(1) a. Statement

ò- ᓄᒃ(?)
3S.NFUT- fall.NFUT(.ST?)

He fell.

b. Question

↑ 沔- ᓄᒃ ᕶByEmail
QU 3S.NFUT- fall.NFUT.QU

Did he fall?
Rialland (2007, 2009)
- question prosody in West African languages
- question markers: high/tense vs. low/lax
- lax question prosody for West African languages
- breathy termination as an understudied type of question marker
  - so far only attested for Gur languages in the work of Rialland and her colleagues
Language background — Ikaan

- SW Nigeria > Ondo State > Ikakumọ village
- Niger-Congo > Benue-Congo > Ukaan > Ikaan

- Two tones: H, L
- *CC
  - Vowel epenthesis, deletion of final /g, m/
- Yes/No questions
  - No morphosyntactic markers necessary
  - Intonation, phonation mode, loudness?
  - Gestural cues: raised eyebrows, inquisitive facial expression, slight tilt of the head
Pilot study data set

- 102 utterances (51 He V-ed, 51 Did he V?)
- one male speaker, 60+ years, well known to the community
- statements and questions identified by ten speakers
- Praat annotations
  - segments, tones, gloss, presence of interrogative markers, notes
- impressions from fieldwork and participant observation
  - in elicitations speaker’s voice gets higher and higher
  - statements end abruptly, questions end in [h]
  - native speaker’s intuition: ‘It goes up!’
Register expansion in questions

Rialland (2007, 39)
- expansion of pitch range in which tones are realised
- potentially higher register/starting pitch
- generally also reduction/cancellation of downdrift

Ikaan
- attested
  - greater pitch range
  - higher starting pitch
- not yet investigated
  - downdrift

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Greater pitch range

(2)  

a. **Statement:** $\delta$ (L, H) 33Hz/3.6 semitones
   ród nę
   3S.NFUT- defecate.NFUT
   He defecated.

b. **Question:** $\delta$ (L, H) 47Hz/4.6 semitones
   ↑ ród nę
   QU 3S.NFUT- defecate.NFUT
   Did he defecate?
Figure: Pitch tracks of ḍnlē in (2a) and ↑/fixtures in (2b)
Greater pitch range?

All-L sentences?

(3) a. Statement

```
O- jənà òbègè
3S.NFUT- buy.NFUT plantain
```

She bought plantain.

b. Question

```
↑ O- jənà òbègè
QU 3S.NFUT- buy.NFUT plantain
```

Did she buy plantain?
**Figure:** Pitch tracks of `Oj`˜an`Ob`Eg`E in (3a) and `Oj`˜an`Ob`Eg`E in (3b)
Higher starting pitch

Pitch of initial L higher in questions

- **Statement vs. Question (examples (1a) and (1b))**
  - 126Hz vs. 138Hz
  - $\delta$ 12Hz / 1.6 semitones

- **Statement vs. Question (examples (2a) and (2b))**
  - 143Hz vs. 154Hz
  - $\delta$ 11Hz / 1.3 semitones

- **Statement vs. Question (examples (3a) and (3b))**
  - 129Hz vs. 139Hz
  - $\delta$ 10Hz / 1.3 semitones
Higher starting pitch?

(4) Question

↑ ū- hjá:
QU 3s.NFUT- tear.NFUT

Did it tear?

- successively lower pitch — list intonation?
  - 1st/2nd: δ 21Hz/2.4 semitones
  - 2nd/3rd: δ 12Hz/1.5 semitones

- ‘absolute pitch’?
Figure: Pitch tracks of ṃ ūhjá́ː in (4)
Breathy termination

Rialland (2007, 46–9)

**Statements end in . . .**
- abrupt intensity decrease
- glottal stop

**Questions end in . . .**
- gradual intensity decrease
- gradually more breathy until voicing stops
- lengthened vowel?
- segmental processes to ‘provide’ final vowel
V-final utterances

(5)  

a. Statement

\( \ddot{o} - kpí \rightarrow [\ddot{o}kpí?] \)

3S.NFUT- hear.NFUT

He heard.

b. Question

\( \uparrow \ddot{o} - kpí \rightarrow [\uparrow \ddot{o}kpíh] \)

QU 3S.NFUT- hear.NFUT

Did he hear?
**Figure**: Spectrograms of òkpí? in (5a) and ũòkpíh in (5b)
Breathy termination?

**Perception experiment**

- Listeners identified questions/statements before the end of the sentence

**Nasal vowels**

(6) Statement (vs. Question)

\[
\text{ò- jómòjǐ} \rightarrow [\text{òjómòjǐh}]
\]

3S.NFUT- try.hard.NFUT

He really tried/did well.
Vowel epenthesis: C-final utterances

(7) a. Statement
ò- jédʒ i  b- ewi  edʒ →
3S- steal epV LOC goat 1S.POSS
[òʃéðʒ í bèwí ेdʒ]
He stole my goat.

b. Question
↑ò- jédʒ i  b- ewí  edʒ  i  =h →
QU 3S- steal epV LOC goat 1S.POSS epV =QU
[↑òʃéðʒí bèwí ेdʒìh]
Did he steal my goat?
Figure: Spectrogram of `S`édZ´i b`ewí é:dZ in (7a)
**Figure:** Spectrogram of \( \uparrow \text{òfédzí bëwí ë:dz ìh} \) in (7b)
/g/ deletion: $g \rightarrow \emptyset / \_C$

(8) 

a. Statement

\[ \ddot{\circ} - \ k\acute{\i}g \rightarrow [\dot{\circ}k\acute{i}k] \]

3S.NFUT- go.to.NFUT

He went.

b. Question

\[ \dagger \ddot{\circ} - \ k\acute{\i}g = h \rightarrow [\dagger\dot{\circ}k\acute{i}h] \]

QU 3S.NFUT- go.to.NFUT =QU

Did he go?
**Figure:** Spectrogram of ḍkîk in (8a) and ṭḍkí:h in (8b)
/m/ deletion: m → Ø / ___{#, C}

(9) a. Statement
v- mâm → [ɔmâ?]  
3S.NFUT- laugh.NFUT

She laughed.

b. Question
↑ v- mâm =h → [↑ɔmâh]  
QU 33S.NFUT- put.NFUT =QU

Did she laugh?
**Figure**: Spectrograms of ˈɔmâʔ in (9a) and ʰ́ɔmâḥ in (9b)
Pro’s and con’s of the clitic analysis

**Pro’s**
- neat phonological explanation of C-final utterances
- similar sentence-final clitics attested in Ikaan (-g NEG)
- clitics are ‘normal’ cross-linguistically

**Con’s**
- unusual phonotactics of /h/
- doesn’t explain the contrast with [?] in statements
- less coherent prosody package as markers
- parallel with Gur languages lost
Summary of question markers

No morphosyntactic markers, only intonation and phonation mode:

- greater pitch range
  - but all-L sentences?
- higher starting pitch
  - but list intonation?
  - but ‘absolute pitch’?
- breathy termination
  - but ‘premature’ answers?
  - but nasal vowels?
- to do: loudness, gestural cues
### Comparison with other languages

#### A linguistic universal?


- low/falling pitch: finality, statements
- high/rising pitch: tentativeness/non-finality, questions

#### West Africa

Rialland (2007)

- tense question prosody
- lax question prosody → against universal high melody
- hybrid question prosody
Tense question prosody

- cancellation or reduction of downdrift, register expansion
- raising of last H(s) (not necessarily sentence-final)
- cancellation/reduction of final lowering
- final H tone or rising intonation (final H%)
- final HL melody

- distribution: Niger-Congo periphery
  - Atlantic, central-western/northwestern Mande, Bantu
  - (Adamawa-Ubangi, Benue-Congo)
Lax question prosody

- final L tone or falling intonation
- final polar tone or M tone
- vowel lengthening
- breathy termination
- cancellation of penultimate lengthening
- open vowel

distribution: Niger-Congo core area

- Gur, Kwa, Kru, southeastern Mande
- (Adamawa-Ubangi, Benue-Congo)
Hybrid question prosody

- question markers from both sets
- distribution
  - not in the ‘core’ area of the Niger-Congo family — periphery?
  - Baule (Kwa): L% and (maybe) register expansion
  - Bambara (Mande): final -a/-wa and rising intonation
  - Izon (Ijoid): final L and H raising
  - contact, convergence?

- mentioned but not discussed in detail in Rialland (2007, 2009)
Ikaan — hybrid prosody

- ‘tense’: greater pitch range, higher starting pitch
- ‘lax’: breathy termination
- location
  - in the ‘mixed’ Benue-Congo subgroup
  - neighbouring languages:
    - Yoruba (Yoruboid): register expansion?
    - Yekhee (Edoid): H%
    - Isoko, Degema (Edoid): L%
    - Engenni (Edoid): register expansion, reduction of downdrift, L%, final /-à/, possibly final /-e/
Ikaan poses a challenge for a tense vs. lax dichotomy because it marks Yes/No questions with both tense and lax markers.

- **Tense prosody**: greater pitch range in which its two tones are realised, higher initial pitch
- **Lax prosody**: abrupt termination in a glottal stop in statements, breathy termination on a vowel in questions, vowel epenthesis and consonant deletion

Ikaan supports Rialland’s (2007, 2009) findings on breathy termination as a question marker.

- First language outside the Gur family to be shown to have breathy termination as a question marker
- A clitic analysis creates more problems than it solves
Future work — data

- from the language documentation corpus
  - various speakers
  - elicitations through translation
  - naturally occurring questions in staged communication
  - naturally occurring question in free narratives

- from a recent acoustic phonetic study
  - audio and laryngograph data
  - 14 speakers (and one semispeaker)
  - 19 statement/question pairs
  - controlled elicitation setting
Future work — experiments, analysis, theory

- speech perception experiments isolating the individual markers — but with what data?
- quantitative analysis
- trajectory of the pitch
- work with musicians: major/minor intervals?
- implications for tense/lax prosody dichotomy
- implications for ‘absolute’ vs. relative pitch

Thank you — mánà káká ḏóː!
### Abbreviations

**Tone marking**

**Glossing**
- 3S – third person singular, NFUT – non-future tense, QU – question marker, ST - statement marker
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