Realizational Differences between Questions and Statements in Defaka

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Universals of intonation in questions and statements (1)

• considerable experimental evidence exists to support an association between sentence type and intonation
  – specifically reflected in pitch differences
• association of low or falling pitch with completion or finality, and so, statements
• high or rising pitch with tentativeness or non-finality, and therefore questions
• the frequency code: Ohala (1984); Gussenhoven (2004)
Figure 1: Schematic representation of F0 traces showing possible differences between statements (solid line) and questions (broken line). a) final raising; b) suspension of downdrift/declination; c) register expansion; d) a combination of a), b), and c).
Universals of intonation in questions and statements (2)

• several languages known which don’t adhere to this quasi-universal: e.g. Hungarian uses L
• work from African tone languages presents further evidence
  – Chichewa (Myers 1996); Hausa (Leben 1984; & co) followed expectations
• other work gives counter-evidence
  – Isoko (Donwa-Ifode 1984); Ibibio (Connell 2004); Mambila (Connell 2005)
Universals of intonation in questions and statements (3)

- Rialland (2007) has challenged the quasi-universal status of heightened pitch as a means of signalling the distinction between questions and statements
- a database of 78 sub-Saharan African languages
  - representing all four Africa phyla
  - in 36 languages questions are marked only by non-high pitched markers,
  - in just 22 languages questions are marked by heightened pitch
Lax question prosody (1)
High-pitched Q-marking vs Non-high pitched Q-marking

- raising of last H
- final H%
- cancellation or reduction of downdrift
- cancellation or reduction of final lowering
- register expansion
- final HL melody

- final polar or M tone
- final L%
- vowel lengthening
- cancellation of penultimate lengthening
- breathy termination
- final open vowel
Lax question prosody (2)

• Rialland’s work raises several questions (…)
• but, demonstrates there are several potential alternative means of distinguishing questions and statements
• reminds us of the paucity of experimental work available on tone languages of Africa regarding this issue
Questions and statements in Defaka (1)

- instrumental data on question vs statement realization in Defaka
- part of a larger study on phonetics and phonology of Defaka and Nkoroo
- part of a documentation project of these two languages
Defaka

- spoken by about 200 people in Nkoroo town, eastern Niger Delta region of Nigeria
- Nkoroo the language of daily use
- a separate branch of Ijoid (Jenewari 1983)
- Shryock et al (1996/7), Williamson (1998) only notable subsequent work
- two tones, downstep
Questions and statements in Defaka (2)

- no previous work done on question formation in Defaka
- Nkoroo: “[q]uestions … have the same pitch patterns as statements. A grammatical construction can be either a statement or a question depending on the situation.” Harry (1987: 72)
- Izon and Nembe use a final L or L%
- Izon also uses register expansion (Williamson 1979)
Questions and statements in Defaka (3)

• Y/N questions: same word order as corresponding declarative sentences; no additional segmental marking
• impressionistically, marked by suspension of declination, possible heightening or expansion of the register
• Q-word questions: interrogative phrase commonly occurs in clause-initial, focussed position; it can optionally occur in the normal position for phrases of its type
Examples

([Wh + O]-S-V)

tári ǹgị ńdọ  Àmànà  ètè-kè?
who axe  FOC_{obj}Amanya  have-TAM
‘Whose axe does Amanya have?’

(S-[Wh + O]-V)

Bòmá tári ǹgị ètè?
Boma who  axe  have-TAM
‘Whose axe does Boma have?’
Investigating realizational differences between questions and statements in Defaka

Method (1)

- set of four sentences: one primarily all L, one all primarily H; two sequences of mixed H, L, and !H
- answers to two possible questions: a Y/N, Q-word
- organized into Q/A session, two participants, P1, P2
- English prompt; P1 questions, P2 answers; P2 questions, P1 answers; etc
- basic declarative sentences recorded independently
- speakers both male, native Defaka; P1 mid 40s, P2 mid 70s
- 12 sentences in total, 2 repetitions of sequence recorded
Example

Q: bòmá èbèrè tà dènè lèlè mà?
   Boma dog PART Denye sell CAUS
   ‘(Did) Boma sell a dog to Denye?’

A: àà bòmá èbèrè tà dènè lèlè mà mà
   yes Boma dog PART Denye sell CAUS
   ‘Yes, Boma sold a dog to Denye.’
Method (2): Measurements

- mean F0 across the entire utterance (Mean F0)
- the first part of the utterance (Mean F01)
- the last part of the utterance (Mean F02)
- these allow insight as to whether register expansion or raising occur across the entire utterance or a phrase within the utterance
- F0 also taken on the final syllable
- duration of the vowel of the final syllable
- presence or absence of breathy voice on final syllable noted
Sample pitch tracks

question

statement
Results (1): measurements Y/N

Table 1: Results for Q/A1, bo  mà be  mà de  liè  mà

<table>
<thead>
<tr>
<th>Spkr</th>
<th>S-Type</th>
<th>Mean F0</th>
<th>Mean F01</th>
<th>Mean F02</th>
<th>Fin F0</th>
<th>Fin Dur</th>
<th>± Breath</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Q</td>
<td>111</td>
<td>106</td>
<td>115</td>
<td>113</td>
<td>161</td>
<td>–</td>
</tr>
<tr>
<td>P1</td>
<td>A</td>
<td>109</td>
<td>111</td>
<td>109</td>
<td>105</td>
<td>183</td>
<td>–</td>
</tr>
<tr>
<td>P1</td>
<td>S</td>
<td>122</td>
<td>124</td>
<td>120</td>
<td>117</td>
<td>215</td>
<td>–</td>
</tr>
<tr>
<td>P2</td>
<td>Q</td>
<td>132</td>
<td>124</td>
<td>136</td>
<td>136</td>
<td>134</td>
<td>+</td>
</tr>
<tr>
<td>P2</td>
<td>A</td>
<td>133</td>
<td>126</td>
<td>138</td>
<td>120 (∼)</td>
<td>134</td>
<td>+</td>
</tr>
<tr>
<td>P2</td>
<td>S</td>
<td>149</td>
<td>145</td>
<td>151</td>
<td>155-102</td>
<td>246</td>
<td>–</td>
</tr>
</tbody>
</table>
Results (2): Y/N summary

- both speakers: no difference in Mean F0 for Q vs A; difference between the first and second parts of the utterance; higher F0 in the second part compared to the first for Q (P2 also shows a rise of similar magnitude for A and S).
- higher F0 maintained through the final syllable; typically flat for Q
- Lowered F0 or fall for A and S utterances.
- vowel duration shows less agreement b/w speakers
- both P1 and P2 showed longer vowels for S utterances
- lack of agreement as to breathiness; ‘breathiness’ observed for P2 may be a result of his age
Results (3): Q-word measurements

Table 2: Results for Q/A: та и kà e be ra dé pe li và ma.

<table>
<thead>
<tr>
<th>Spkr</th>
<th>S-type</th>
<th>Mean F0</th>
<th>Mean F01</th>
<th>Mean F02</th>
<th>Fin F0</th>
<th>Fin Dur</th>
<th>± Breath</th>
</tr>
</thead>
<tbody>
<tr>
<td>P 1</td>
<td>Q</td>
<td>111</td>
<td>106</td>
<td>114</td>
<td>109-107</td>
<td>236</td>
<td>–</td>
</tr>
<tr>
<td>P 1</td>
<td>A</td>
<td>115</td>
<td>110</td>
<td>110</td>
<td>111-103</td>
<td>220</td>
<td>–</td>
</tr>
<tr>
<td>P 2</td>
<td>Q</td>
<td>134</td>
<td>127</td>
<td>139</td>
<td>138</td>
<td>223</td>
<td>+</td>
</tr>
<tr>
<td>P 2</td>
<td>A</td>
<td>132</td>
<td>123</td>
<td>140</td>
<td>148-114</td>
<td>202</td>
<td>+</td>
</tr>
</tbody>
</table>
Results (4): summary Q-word

• results similar to those for Y/N
  – little overall difference
  – second part of Q shows heightened pitch relative to first part
  – final syllable flat, same height for Q
  – final syllable falling for A
• initial Q word shows heightened pitch
Summary discussion

• unlike Nkoroo (Harry 1987), Defaka does distinguish questions and statements by means of pitch
• Defaka uses High-pitch marking; no evidence is found for ‘lax question prosody’ (Rialland 2007)
• no evidence is found for a L or L% as has been reported for certain other Ijoid languages (Williamson 1979)
• further work will test Harry’s claim regarding Nkoroo
• if this is born out it provides interesting evidence for the maintenance of phonetic characteristics, even within a severely endangered language.
References
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Documenting Defaka [afn] and Nkoroo [nkx]