THE PROSODIC INTEGRATION OF TEKO IDEOPHONES

FRANÇOISE ROSE, JENNIFER KRZONOWSKI & MAO-LINE FILLON (DDL, CNRS/UNIVERSITÉ DE LYON)
TEKO

- a.k.a. Emerillon
- Tupi & Tupi-Guarani
- French Guiana
- ~ 400 speakers, active transmission to children
- Texts collected from 1990 to 2004 (1h40 audio recordings +17 texts w/o recordings)
- Grammar (Rose 2011)

TEKO IDEOPHONES: BASIC FACTS

- 105 ideophones / 1321 lexemes
  - Not a « small » part of speech (8%)
- 405 occurrences in texts / 2000 sentences
  - Once in every 5 sentences in average
- Described in Rose (2011:400-409)
  - PoS illustrating expressively a situation

TEKO IDEOPHONES: PREVIOUS WORK

- Semantics
  - Often actions, rarely states (‘be with closed eyes’, ‘be dark’)
  - Not a one-to-one correspondance with the semantics of the verbs
  - Phonosemantics

- Phonology
  - Regular segmental inventory (except /f/ in one ideophone)
  - Regular phonotactic rules (no word-internal CC –one exception, VV allowed)
  - Frequency of segments differ from the rest of the lexicon

- Prosody: only some vague impressions
PROSODY OF IDEOPHONES

- Prosody as an under-investigated domain for ideophones
  - Anecdotal facts rather than comprehensive studies
  - Descriptive rather than quantitative approaches
  - Emphasis on features that depart from regular lexicon

- Prosody could be an additional domain to evaluate « weirdness » of ideophones
  - See review of expressive use of suprasegmentals in ideophones (Smoll 2014:20)
INTEGRATION OF IDEOPHONES

- Ideophones often presented as « weird » and « extra-systematic » (see discussion in Newman 2001)
  - Phonosemantics, iconicity
  - Phonological irregularities
  - Lack of morphology
  - Lack of syntactic integration

- In descriptions of ideophones, stress often put on differences with other PoS
  - Ex: Used mostly/only in declarative clauses and narrations.
  
  But in Teko, can be found in imperative clauses in everyday conversation: \textit{pug ere IDEO.put 2.say ‘Put it down!’}

GOALS OF THE TALK

- Contribute to a better knowledge of the prosody of ideophones
  - Focusing on one language
  - With a quantitative approach
- Are the ideophones really « weirdoes » in language systems?
- Make progress on the issue of the prosodic integration of ideophones at different levels
  - Prosodic root structure
  - Prosody and morphology
  - Prosody and syntax
  - Stress and expressiveness
METHODOLOGY

- Study based on
  - Toolbox lexical list of 105 ideophones
    - For their internal structure
  - Random sample of 102 audio-recorded occurrences of ideophones in text
    - For their prosodic properties in discourse, in relation with semantics and syntax
    - Segmentation in Praat:
      - Pauses
      - Vowels (pitch, intensity and duration following methodology in Gordon & Rose 2006: word-final vowels excluded)

PROSODIC ROOT STRUCTURE
Ideophones are more often monosyllabic (42%) than other PoS: 12% for verbs ($p < .001$) and 8% for nouns ($p < .001$).

Plurisyllabic ideophones may be overestimated (reduplication issue).
- Ideophones (and verbs) start significantly less with a vowel than nouns ($p < .01$)
Ideophones show a final consonant (65%) more often than nouns (32%, $p < .001$) but not than verbs (57%, $p = .22$).
VOWEL HARMONY IN IDEOPHONES

- Akita et al. 2013: “an unmarked pattern in mimetics”

VOWEL HARMONY

- Kind of vowel harmony investigated
  - Total identity of vowels throughout the root: « monovocalic ideophones » (Dingemanse 2011)
  - Ideophones are more often monovocalic than other PoS (all \(ps < .001\))

\[
\chi^2 (2) = 45.61; \ p < .001
\]

Monovocalic ideophones more often have a medial /ɾ/ than monovocalic words of other PoS (p < .01)
MONOVOCALITY & MEDIAL CONSONANT

- The combination of both monovocality and medial /t/ in ideophones is higher than expected (50% vs 18%)
  - Given the rate of both monovocality and medial /t/ in ideophones

- Link between monovocality and medial /t/ ?
  - Phonologically: vowel harmony with /t/ as a transparent consonant ? Little work on consonant interference (Hulst and Weijer 2011)
  - Semantically: monovocality to express regularity of the event (Dingemanse 2011), default /t/ too ?
  - Morphologically: as the result of a reduplication pattern with a fixed consonant ? Cf. Malak Malak (Birk 1976)

CONCLUSION ON PROSODIC ROOT STRUCTURE

- Ideophones maintain the canonical syllable structure of the language
  - ((C)V.)((C)V.)...CV(C)

- But with some preferences: a higher probability of
  - being monosyllabic
  - having an initial and a final consonant
  - having both monovocality and a medial /ɾ/

- Root structure is not a definitional criterion for ideophones, but participates to their identification
- In general, the structure of ideophones is closer to that of verbs than that of nouns
PROSODY AND MORPHOLOGY
MORPHOLOGY OF IDEOPHONES

- No bound morpheme, no derivation
  - Unlike nouns and verbs (rich predicate morphology)

- But reduplication
In verbs, exact copy of one or two initial syllables, without their coda (Rose 2005): CV ~ CV(C)

- Monosyllabic reduplication expresses event-internal repetition (including plurality of participants)
- Bisyllabic reduplication express event-internal or event-external repetition (Rose 2007, based on Cusic 1981)
A few robust examples of reduplication in ideophones

- Monosyllabic reduplication, with either one or two copies
- Medial consonant can differ from C of the base, and is /ɾ/ \(CV_1 \sim CV_1\) (C)
  
  \[ex: \text{kʷəɡ kʷəəɡ kʷəəəɡ}\]

- Event-internal repetition

- \(CV_1 CV_1 (rV_1)(C)\) ideophonic forms are numerous
  - potentially more reduplication cases
  - basic form missing

- Other suspect forms, with other patterns, & basic form missing: \(kosokosog\)

- More data needed...
IDEOPHONIC COMPOUNDS?

- High number of sequences of ideophones (66/102)
  - Different ideophones (2 to 3): sequence of events in chronological order (26/102)
  - Same ideophone (from 2 to 8): internal repetition of the same event (40/102)

- Some sequences of ideophones show some phonological integration
  - Final consonant deletion before an initial consonant
  - As expected between any words within a prosodic unit
  - Ideophonic compounds? Cf. ‘fusion’ in Aweti (Reiter 2011:323)

(10)  ko  kuʔ-e-kuʔe  ki(r)  tou  o-wiʔ  o-ʔa  zawapimin-aʔar.
      then  IDEO.shake-RED  IDEO.detrach  IDEO.fall  3-detach  3-fall.GER  jaguar-REF-ON
   ‘Then kuʔe kuʔe ki r tou it shakes and falls down on the jaguar.’ 05.025
A pattern reminiscent of other PoS
- Monosyllabic reduplication
- Same semantics

With some specificities
- No bisyllabic reduplication
- Fixed consonant in reduplication
PROSODY AND SYNTAX
PAUSES BEFORE IDEOPHONES

- 79% with a preceding pause
  - Before a single ideophone or the first ideophone of a sequence
- Average duration of pause: 0.76 ms
  - Impression of long pauses
  - But in fact inter-clause pauses with average duration 1.15 ms
PAUSES BETWEEN IDEOPHONES

- 78% of ideophones are followed by a pause before another ideophone
- Average duration of pauses: 0.57 ms
- Pauses are shorter between identical ideophones than different ideophones
  - 0.55 ms (n = 26) vs. 0.63 ms (n = 7)
- Pauses are equivalent between identical ideophones whatever the meaning of the repetition
  - 0.49 ms temporal repetition (n = 30), 0.47 ms (n = 5) plurality of participants
SYNTAX OF IDEOPHONES

- Sentence-initial
  - Preceded by conjunctions only
  - Not considered as ‘first constituent’ for second-position particles

- 3 degrees of syntactic integration
  - Presented from less to more integrated
  - Individual ideophones can occur in different constructions
SYNTAX

1. Independent
   - 2 sub-types depending on semantic contribution

1a. Holophrastic
   - sole expression of the event

(1) *dirig*, *kaʔi* *wãũwĩ-a-te* *o-i/u* *o-bo-pusug*

*IDEO.watch* macaca woman-REF-FOC 3-clothe 3-CAUS-take_off

‘He watches, the female macaque is taking her clothes off.’ 23.018
SYNTAX

1b. Collocational
   - Co-expresses and specifies the event expressed by a verb (can be considered optional)
   - Sometimes referred to as « manner adverbial »

(2) *kar o-eta nipē-am.*

**IDEO.cut** 3-cut bread-TRANS

‘Slash, he cut bread.’
2. Light-V construction
   - Introduced by a light verb immediately following the ideophone(s)
     - ʔe ‘say, do (a noise)’, with irregular form with third person subject eʔi
     - baʔe ‘do, make’

(3) *moŋ*  
  **IDEO.be_dark**  3.say  
  ‘It is dark.’ [no control of the S]

(4) *moŋ*  
  **IDEO.be_dark**  3-make  
  ‘S/he turns the light off.’ [control of the S]
3. Argument-taking

- Absence of verb co-expressing the event
- Presence of participants of the event
- No verbal morphology

(5) \textit{wuwu} \quad o-\textit{iru}
\textit{IDEO.thrust} \quad 3-clothe

‘She gets dressed (puts on her clothes).’
PAUSES AFTER IDEOPHONES

- Correlation with semantico-syntactic integration
  - The less integrated syntactically
    - the more pauses
    - the longer the pause

<table>
<thead>
<tr>
<th>Presence of a pause</th>
<th>Average duration of pause</th>
<th>Number of tokens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holophrastic</td>
<td>67%</td>
<td>0.53</td>
</tr>
<tr>
<td>Collocational</td>
<td>49%</td>
<td>0.52</td>
</tr>
<tr>
<td>Light-verb</td>
<td>17%</td>
<td>0.28</td>
</tr>
<tr>
<td>Argument-taking</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>
PAUSES AFTER IDEOPHONES

- Analysis
  - Ideophones are integrated prosodically with what follows
    - In the light-verb construction (as with direct speech and quotative verb, cf. Rose and Vanhove 2007)
    - In the argument-taking construction (as in VPs)
  - Ideophones form a separate prosodic unit when in the independent construction
    - Supports an analysis as clause-external
    - Collocational ideophones are less likely to be syntactically « adverbial »

- Results complementing the inverse relation between expressiveness and syntactic integration (Dingemanse and Akita 2017)
  - Pitch, phonation type, reduplication & lengthening

Variety of degrees of integration
- Not necessarily extra-clausal
STRESS
STRESS IN TEKO

- Stress in Teko (Gordon & Rose 2006)
  - On penultimate, or on final syllable if heavy
    - On words in isolation
    - On prosodic phrases in connected discourse
  - Acoustic cues:
    - Duration and intensity on words in isolation
    - Pitch additionally in discourse data.

STRESS IN IDEOPHONES

Syllable position

Vowel duration (ms)

Intensity (dB)

Mean Pitch (Hz)

Number of syllables

2 3

2 3

2 3

0 20 40 60 80 100 120 140 160

0 72 73 74 75 76 77 78 79

0 220 230 240 250 260

2 3

Number of syllables

2 3

Number of syllables

2 3

Number of syllables
STRESS IN IDEOPHONES

- Stress on first syllable
  - All three cues concord (duration, pitch, intensity)
  - Contrary to the pattern on the regular lexicon for words with heavy-final syllable
STRESS IN IDEOPHONES

- Yet 6/18 bisyllabic ideophones with final stress
  - Two or three of the cues
  - Whether with heavy final syllable (here)
  - Or light final syllable (*hija* sequence)
    - Then contrary to regular lexicon

petcg
STRESS IN IDEOPHONES

- For most trisyllabic ideophones
  - Some prominence on initial vowel
CONCLUSION ON STRESS

- Not following the general rules
  - First syllable stressed even with heavy-final
  - Light-final syllables can be stressed

- Some irregularities among ideophones
  - Or expressiveness overrides regular stress placement?
EXPRESSIVENESS
« VARIATION IN PITCH, LOUDNESS AND SPEED OR A SPECIFIC RHYTHM HAVE A DIRECT AFFECT ON THEIR MEANING » (REITER 2011:308)
In general, ideophones show a higher pitch and volume than the surrounding text (Gordon & Rose, 2006) – gender not normalized.
PITCH AND VOLUME

- High pitch and volume

- Expressive high pitch also in other PoS
Expressive variation in volume
Pitch is usually decreasing on ideophones

- Throughout the word

- And within vowels
PITCH

- Decreasing pitch in three ideophones
- But also in interjections and vocatives
Expressive variation in pitch
VOWEL DURATION

- Average duration in ideophones comparable to or higher than that of regular lexicon (Gordon & Rose 2006)
VOWEL DURATION

- Average vowel duration in ideophones higher than that of regular lexicon (Gordon & Rose 2006)
- Vowel lengthening especially frequent in monosyllables (here excluding word-final vowels)

- The expressive prolongation of vowels is an iconic means of signifying an extension in space or time (Reiter 2011, Childs 1994).

VOWEL DURATION

- Vowel lengthening

- Not restricted to ideophones
  - Often for plurality of participants
Prosody used to
- make ideophones more salient in discourse
- express additional meaning (time, motion, rhythm...)

But not strictly restricted to ideophones
- Similar interpretation
CONCLUSION
An advance in the description of the prosody of ideophones
- Offers quantitative analyses to support impressionistic prosodic description in Rose (2011)
- Offers a detailed prosodic profile of ideophones in a language to facilitate
  - Other descriptions
  - Comparison within the Tupi family (Reiter 2011)
  - Typological studies
Ideophones are rather well integrated in the lexicon

- Regular phonotactics
- Monosyllabic reduplication (like on verbs)
- Prosodic integration
- Same interpretation of expressive prosody than other PoS

→ Not outside of grammar

Regularities usually unnoticed (// Newman 2001 on Hausa)
CONCLUSION

Ideophones show some straightforward distinct features

- No bisyllabic reduplication
- Stress placement

Ideophones show biases

- Higher probability of being monosyllabic
- Higher probability of having an initial and a final C
- Higher probability of having both monovocality and a medial /ɾ/
- Can stand alone as a prosodic unit
- More salient in discourse
- High use of expressive prosody

Some of these biases may be universal
turulğ

IDEO.strike.water.with.fists.when.happy

‘clapping’
To investigate further
- Reduplication process
- Stress
- Phonosemantics
- Gestures (with videos)

Comments and suggestions are very much welcome!
SEQUENCES OF IDEOPHONES

- High number of sequences of ideophones (66/102)
  - Different ideophones (2 to 3): sequence of events in chronological order (26/102)
    (6) $ko \ kuʔe-kuʔe \ ki(r) \ tou \ o-wiɾ \ oʔa \ zawapinim-aʔar$. 
      then IDEO.shake-RED IDEO.detach IDEO.fall 3-detach 3-fall.GER jaguar-REF-on 
      ‘Then $kuʔe-kuʔe \ ki(r) \ tou$ it shakes and falls down on the jaguar.’ 05.025
  
- Same ideophone (from 2 to 8): internal repetition of the same event incl. plurality of participants (40/102)
    (7) $\text{Hija} \ \text{hija} \ \text{hija} \ \text{hija} \ \text{hija} \ \text{hija} \ \text{hija} \ \text{hija} \ \text{hija}$
      IDEO.step IDEO.step IDEO.step IDEO.step IDEO.step IDEO.step IDEO.step IDEO.step
      ‘Hija hija hija hija hija hija (someone goes out)’. 21.157
SEQUENCES OF IDEOPHONES

- Expressive prosody of the sequences
  - Often regular tempo, variation in intensity and pitch
  - Last item often salient, prosodically or through reduplication

(8) kʷəɾə kʷəɾə kʷəɾəɾə upi o-wiro-ho.
  IDEO.climb IDEO.climb IDEO.climb-RED along 3-climb 3-go
  ‘Kʷəɾə kʷəɾə kʷəɾəɾə they climb away along it (a huge tree)’. 21.193

(9) kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ ku~ɾu~ɾu~ɾu.
  IDEO.dig IDEO.dig IDEO.dig IDEO.dig IDEO.dig IDEO.dig IDEO.dig IDEO.dig IDEO.dig-RED
  ‘Kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ kuɾuɡ (a dog is digging a tunnel)’. 21.146