On the prosodic expression of prominence in typologically different languages

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Overview of the talk

• Prosodic expression of prominence
• Pitch register and downstep
• Case studies: German, Hindi, Akan
• Conclusion – the function of intonation determines its interaction with pragmatics (focus)
Prominence in intonation languages

Intonation highlights information. Prominent information (focus) raises pitch register on focused constituent and increases duration.

(1)
A: Erzähle mal, was ist los!
B: Frau **Liehner** will **Blumen** malen.

(2)
A: Wer will Blumen malen?
B: **Frau Liehner** will **Blumen** malen.

**Broad focus**  
**Narrow focus**

(Féry & Kügler 2008; Kügler 2008; Kügler & Genzel subm. a)
Prominence in tone languages

F0 maintains the distinction of lexical tone. Yet, prominence raises pitch register as in intonation languages, e.g. Mandarin Chinese (Xu 1999:64)
Prosodic expression of prominence

Tone and intonation languages express focus by means of pitch register raising, e.g.
  Mandarin Chinese (Xu 1999),
  German (Féry & Kügler 2008).

However, not all languages use prosodic means to express focus, e.g.
  Yucatec Maya (Kügler & Skopetelas 2007),
  Northern Sotho (Zerbian 2006),
  Haussa (Hartmann & Zimmermann 2007),
  Wolof (Rialland & Robert 2001).

Pitch register is also influenced by tonal processes such as downstep.
Register raising & Downtrends

Prominence raises the pitch register and lengthens the prominent constituent (e.g. English: Eady et al. 1986; Danish: Grønnum 1992; German: Kügler 2008, Féry & Kügler 2008; Japanese: Ishihara 2007).

Register lowering on the other hand is well established in tone as well as in intonation languages, e.g.

- Haussa (Leben et al. 1989),
- Akan (Dolphyne 1988, Abakah 2002),
- English (e.g. Armstrong & Ward 1926; Pierrehumbert 1980),
- German (e.g. Féry 1993, Grabe 1998).

Register lowering is referred to as downstep where a low tone triggers the lowering of subsequent high tones.
Prominence, downstep & pitch register

Definitions: (Ladd 1990)

Pitch range: Speaker specific parameter
- Baseline & setting of pitch register
- Changes of pitch range: e.g. emotions

Pitch register: Reference lines relative to which local tonal targets are scaled (Clements 1979).
- Changes of pitch register: prominence, downstep
Which kind of interaction of prominence realisation and downstep exist in different languages?

German – Intonation language (Féry 1993)
Hindi – Phrase language (Moore 1965; Féry, 2009)
Akan – Tone languages (Dolphyne 1988)
Intonation and prominence – German (Féry & Kügler 2008)

Factors in a production study:
- Information structure (wide focus, narrow focus on arguments)
- Number of arguments in a sentence
- Word order

Design:
- 18 speakers, students at Potsdam University
- Aural & visual presentation of context questions
- Digital recording of 2340 target sentences
- Dependent variable: F0-maximum

Speech materials, example:
The sheep wanted to introduce the buck to the lion. Why didn’t he do this?

\textbf{Weil der Hammel den Rammler dem Hummer vorgestellt hat.} ‘Because the sheep introduced the buck to the lobster.’
Results – German

- [NDAV] - wide focus
- ND[A]V - narrow focus
- [NDAV] - wide focus, downstep

(upstep of an argument or verb occurred in approximately 50% of the cases)
**Intonation and prominence – Hindi**

**Hindi** is a phrase language with rising pitch accents on every content word except the last one, and relatively free word order (Moore 1965, Harnsberger 1994, Féry 2009).

**Production experiment:** (Patil, Kentner, Gollrad, Kügler, Féry, Vasishth, 2008)
- Interaction of intonation, prominence and word order

**Factors:**
- Information structure (wide focus, subject and object focus)
- Word order (SOV, OSV)

**Design:**
- 20 speakers, students at Delhi University
- Aural & visual presentation of context questions
- Digital recording of 1200 target sentences
  (20 speakers x 10 items x 6 conditions)
- Dependent variables: F0-maximum, F0-range, duration
Intonation and prominence – Hindi

Speech materials:

(3) Wide focus / All-new sentence:
A: kyaa huaa? ‘What happened?’
B: [graahak ne davaaii ko khariidaa]F ‘The customer bought the medicine.’

(4) Narrow focus on object:
A: graahak ne kyaa khariidaa? ‘What did the customer buy?’
B: graahak ne [davaaii ko]F khariidaa ‘The customer bought the medicine.’

(5) Narrow focus on subject:
A: kisa ne davaaii ko khariidaa? ‘Who bought the medicine?’
B: [graahak ne]F davaaii ko khariidaa ‘The customer bought the medicine.’

→ No prominence marking by means of intonation

→ Compression of pitch register on post-focal constituent (object)

(Patil, Kentner, Gollrad, Kügler, Féry, Vasishth, 2008)
Results – Hindi, SOV word order

- Downstep
- No register raising (but increased pitch span under focus, Genzel & Kügler 2010)
- Post-focal register compression

**Focus**
- Lower F0-max ($t=-9.06$), lower F0-range ($t=-9.94$), shorter duration ($t=-6.24$)
Results – Hindi, OSV word order

![Diagram showing pitch contour OSV with focus on Object, Subject, and Verb positions.](image-url)
Summary – Hindi

All-new sentences: Dominant downstep pattern

Focus: Dominant downstep pattern;
Object focus = all-new sentence

Pre-focal givenness: No effect
Post-focal givenness: Post-focal compression,
shorter duration
Tone and prominence – Akan

Akan – Kwa language, Niger-Congo

5 Mio. speakers in Ghana and Ivory Coast (Schachter & Fromkin 1968).

Two tone language, low (´) and high tone (´) (Dolphyne 1988:55f).

Tone has mainly grammatical function (Dolphyne 1988:66f).

(6a) Kófî gyìná hó.  
(6b) Kófî gyìnà hó.  
Kofi stands there.  Kofi is standing there.

Focus is expressed by means of a focus particle nà as well as tonal raising (↑) according to (Boadi 1974:19).

(7a) mébá há  
(7b) mé nà ↑mébá↑ há  
I-hab-come here  I FM I-hab-come here

However, Kügler & Genzel (submitted, b) found tonal lowering under focus.
Phonology of tone in Akan

Tonal processes:

H-tone lowering (downstep, downdrift)
(Schachter & Fromkin 1968; Dolphyne 1988; Abakah 2000, 2002)
In a tonal sequence of HLH, the second H-tone is lowered with respect to the first H-tone.

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  __  __
 L H L H
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Different types of downstep are recognized in Akan (lexical, automatic, and non-automatic), yet with no distinct phonetic realisations.
Syntax and information structure in Akan

Akan is a SVO language (Kobele & Torrence 2006).

(8) kòfí bòò àmà
    kofi hit.past ama ‘kofi hit ama’

Focus is syntactically expressed in sentence initial position, and obligatorily marked by a FM *na*.

(9) Object focus (Kobele & Torrence 2006:164)
    (ε-yε) ama na kofi boo
    it-is ama FM kofi hit.past ‘it’s ama who kofi hit’

Focus can be realised in its base position (*in-situ*) as well, yet with an optional FM.

(10) Object focus
    kofi boo ama (na)
    kofi hit.past ama (FM) ‘kofi hit AMA’
Akan

Production experiment:
- Interaction of prominence and downstep

Factors:
- Information structure
  (wide focus, narrow focus, contrastive focus)
- Downstep
  (automatic, non-automatic)

Design:
- 11 speakers, Akan, dialect: Asante Twi
- Recordings in Ghana, Jan 2009, Susanne Genzel
- Aural & visual presentation of context questions
- Digital recording of 88 target sentences
  (1 speakers x 2 items x 4 conditions)
- Dependent variables: F0-contour, duration, (F0-max, F0-min)
Automatic Downstep

• Basics

(11) L H L H L H L H

Kofi + papa → kofi papa
Kofi father Kofi’s father

• Speech materials

Kòfí pàpá rebó Anúm
Kofi.Gen dad beat.prog Anum
Kofi’s dad is beating Anum.

• Results

Mean amount of downstep in (st)

<table>
<thead>
<tr>
<th>item</th>
<th>broad focus</th>
<th>cFoc N1N2</th>
<th>cFoc N1</th>
<th>cFoc N2</th>
</tr>
</thead>
<tbody>
<tr>
<td>kofi papa</td>
<td>5.4</td>
<td>5.1</td>
<td>5.2</td>
<td>5.1</td>
</tr>
</tbody>
</table>

(Dolphyne 1988:56)
Non-automatic downstep, segment deletion

• Basics

(12) LH L HH LH !HH
   kofi + ɔdan → kofi dan
   Kofi house  Kofi’s house

• Speech materials

Kòfí       dán póno no yɛ fitaa.
Kofi.Gen room door det aux.pres white
Kofi’s room has a white door.

Mean amount of downstep in (st)

<table>
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<th>item</th>
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<th>cFoc N1</th>
<th>cFoc N2</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3)kofi dan</td>
<td>5</td>
<td>5.2</td>
<td>5.2</td>
<td>4.8</td>
</tr>
</tbody>
</table>

(Dolphyne 1988:59)
Summary – Akan

Downstep is realised.
Downstep is not influenced by prominence – the “step down” is equal between conditions.
Focus induces a lowering of pitch register (cf. Kügler & Genzel submitted, b); downstep appears to resist any pragmatic influence, i.e. no F0-reset due to focus.
Prominence, Register, F0 and Duration

**German:**
(Féry & Kügler 2008; Kügler 2008;)

**Hindi:**
(Patil, Kentner, Gollrad, Kügler, Féry & Vasishth 2008; Genzel & Kügler, subm.)

**Akan:**
Intonation and its function

Intonation structures and highlights information. Two types of tones:
- pitch accents – metrical prominence
- boundary tones – phrasing

German:

\[ \text{L}^*\text{H} \quad \text{L}^*\text{H} \quad \text{H}^*\text{L} \]

Weil der Hammel\text{[p]} den Rammler\text{[p]} dem Hummer vorgestellt hat\text{[p]}\text{[l]}.
‘Because the sheep introduced the buck to the lobster.’

Hindi (according to Féry 2009)

\[ \text{L}_p \quad \text{H}_p \quad \text{L}_p \quad \text{H}_p \quad \text{H}_p \quad \text{L}_l \]

[ [graahak ne]_p [davaai ko]_p [khariidaa]_p]_l \rightarrow \text{Demarcation of prosodic words}

customer\text{ ERG } medicine\text{ ACC } buy-PAST

‘The customer bought the medicine.’
Intonation and its function

Intonation structures and highlights information. Two types of tones:
  - pitch accents – metrical prominence
  - boundary tones – phrasing
Lexical tone in tone languages distinguishes words and/or has grammatical function, e.g. distinguish verb aspect.

Akan:

(6a) Kófì gyìná hó.  
Kofi stands there.  
(6b) Kófì gyìnà hó.  
Kofi is standing there.

→ Grammatical function
Intonation and its function

Conclusion:

If tone functions to express any kind of grammatical function (verb aspect, phrasing or word demarcation) pragmatic influences appear not to override the pitch register settings.

In Hindi prosodic words are grouped, in Akan verb aspect (among others) is expressed by means of tones. Thus, the grammatical function expressed by means of tones dominates any influence from pragmatics.
Féry, C., 1993. German Intonational Patterns. Tübingen: Niemeyer

Kügler, F. & Genzel, S. subm, a. Sentence length, position, and information structure effects on duration in German. Subm. to J.Phon.


Xu, Y. 1999. Effects of tone and focus on the formation and alignment of f0contours. JPhon 27, 55-105.

Thank you for your attention!

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Akan