A phonological model of Uyghur Intonation

Travis Major & Connor Mayer
University of California, Los Angeles

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Intonational Phonology of Typologically Rare or Understudied Languages
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Uyghur

- ~10 million speakers
- Spoken primarily in Xinjiang, China and neighboring regions.
- Southwestern Turkic language, most closely related to Uzbek.
Basic Grammar

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>Adjunct</th>
<th>Verb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ikki yaman adem</td>
<td>her qizil almi-ni</td>
<td>mektep-te</td>
<td>yé-di</td>
</tr>
</tbody>
</table>

“Two bad men ate each red apple in the school.”

- Generally subject >> object >> verb.
- Case marking.
- Flexible word order (default SOV).
- Almost exclusively a suffixing language.
Goals of this presentation

We will present a phonological model of Uyghur in the autosegmental metrical framework (Pierrehumbert 1980; Beckman & Pierrehumbert 1986; Ladd 2008).

- Extends Major & Mayer (2018)
- Work is still ongoing!

In particular, we will

- Provide additional data on stress in Uyghur
- Describe more complex IP boundary tones
Stress in Uyghur

Uyghur has been claimed to be a stress language where only duration is correlated with stress (Yakup 2013; Major and Mayer 2018)

- Pitch and intensity are not
- Speakers have (sometimes inconsistent) intuitions about syllable prominence

Suggests Uyghur is a stress language with only edge-marking intonation!

- i.e., stressed syllables cannot be identified from the pitch contour
- Differs from Turkish, which is (generally) considered a stress language with both edge- and head-marking intonation (e.g., Ipek 2015)
Typological background

A stress language with only edge-marking intonation is unusual in prosodic typology (Jun 2005)

- Not unattested: Kuot (Lindström & Remijsen 2005), Chimwiini (Kisseberth and Abasheikh 2011), and Chuvash (Dobrovolsky 1999)
- No formal models of prosody for these languages
An acoustic study of Uyghur stress and intonation

**Participants:** 8 native speakers of Uyghur

- 4 from Xinjiang, China (2M, 2F)
- 4 from Almaty, Kazakhstan (2M, 2F)

**Stimuli:** Two carrier phrases

- ______ bek yaxshi söz “_______ is a good word”
- Mahinur ______ deydu “Mahinur will say _______”
Target words from Yakup (2013)

<table>
<thead>
<tr>
<th>Word 1</th>
<th>Gloss 1</th>
<th>Word 2</th>
<th>Gloss 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAKa</td>
<td>gauze</td>
<td>daLA</td>
<td>plain</td>
</tr>
<tr>
<td>BAza</td>
<td>base</td>
<td>baHA</td>
<td>price</td>
</tr>
<tr>
<td>DACHa</td>
<td>villa</td>
<td>daDA</td>
<td>father</td>
</tr>
<tr>
<td>DOra</td>
<td>medicine</td>
<td>doQA</td>
<td>forehead</td>
</tr>
<tr>
<td>CHAsa</td>
<td>square</td>
<td>chaTAQ</td>
<td>problem</td>
</tr>
<tr>
<td>ACha</td>
<td>elder sister</td>
<td>aCHA</td>
<td>branching</td>
</tr>
<tr>
<td>BAla</td>
<td>child</td>
<td>baLA</td>
<td>disaster</td>
</tr>
<tr>
<td>Ara</td>
<td>fork</td>
<td>aRA</td>
<td>between</td>
</tr>
</tbody>
</table>
Procedure

- Consultants read sentences from randomized list
- Sentences preceded by context question:
  
  *Néme boldi?*  “What happened?”

- Each word read once in each carrier phrase
- Measured **vowel duration, intensity, and pitch**
  - No interesting effects for intensity
- Analyzed using linear mixed effects models
Pitch results

- No significant effect of stress
- Last syllable > first syllable
- Word initial > word medial
- Word initial last syllable > word medial last syllable
Duration results for Xinjiang speakers

- Stressed > unstressed
- Syllable 2 utterance initially > syllable 2 utterance medially (marginal)
Duration results for Almaty speakers

No significant differences in duration!
Results summary

**Pitch:** predicted by position of syllable in word, and word in utterance

- Final syllable > initial syllable
- Utterance-initial > utterance-medial

Consistent with edge-marking intonation

**Duration:** Stress location is a significant predictor of **duration** but not **pitch**

- Stressed > unstressed

But only for Xinjiang speakers!
Uyghur intonational phonology

Our model has three prosodic levels above the word:

- Accentual phrase (AP)
- Intermediate phrase (ip)
- Intonational phrase (IP)

Based on the results from the previous section, our model only involves edge-marking intonation.
Accentual Phrase (AP)

The first level above the prosodic word:

- Left edge marked by L tone.
- Right edge marked by Ha tone.
- Consists of at least one prosodic word.
- Multi-word APs generally arise in *modifier-noun* constructions.
Accentual phrase (AP)

- All APs show L H sequence, not all words!
Intermediate phrase (ip)

Contains one or more APs

- H- tone on right edge
  - Higher than the Ha tone marking the edge of APs.
  - Larger following juncture (Major & Mayer 2018)
- Neutral sentences: subject generally forms an ip
- Focused elements generally form ips
## Object focus

<table>
<thead>
<tr>
<th>L</th>
<th>Ha</th>
<th>L</th>
<th>H-</th>
<th>L</th>
<th>L%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahinur</td>
<td>böljürgen-ni-la</td>
<td>mijiwet-ti</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mahinur</td>
<td>strawberry-acc-foc</td>
<td>squeeze-pst.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Post-focus de-phrasing

<table>
<thead>
<tr>
<th>L</th>
<th>Ha</th>
<th>L</th>
<th>H-</th>
<th>L</th>
<th>L%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muellim</td>
<td>Mahinur-ghi-la</td>
<td>bir</td>
<td>almi-ni</td>
<td>ber-di</td>
<td></td>
</tr>
<tr>
<td>teacher</td>
<td>Mahinur-dat-foc</td>
<td>an</td>
<td>apple-acc</td>
<td>give-pst.3</td>
<td></td>
</tr>
</tbody>
</table>
Intonational phrase (IP)

Contains one or more ips

- L% on the right edge for basic declaratives.
- H% for continuations or juxtaposed clauses.
- Polar questions end with either an H%, HL%, or LH%.
  - May be dialectal to some extent
- Wh-questions can end in an LH% or HL%
  - Often more closely resemble focus constructions.
Polar questions: Xinjiang speaker

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>H-</th>
<th>L</th>
<th>Ha</th>
<th>L</th>
<th>H%</th>
</tr>
</thead>
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<td>böljürgen-ni</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mahinur</td>
<td>strawberry-acc</td>
<td>squeeze-pst.3-q</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Polar questions: Almaty speaker

<table>
<thead>
<tr>
<th>L</th>
<th>H-</th>
<th>L</th>
<th>Ha</th>
<th>L</th>
<th>HL%</th>
</tr>
</thead>
<tbody>
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<td>böljährgen-ni</td>
<td>mijiwet-ti-mu</td>
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<td></td>
</tr>
<tr>
<td>Mahinur</td>
<td>strawberry-acc</td>
<td>squeeze-pst.3-q</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
WH-questions

Wh-questions show considerable variation:

● The wh-expression bears focus (H- on the right edge).
  ○ The following material generally de-phrase, like in regular focus as well.

● The right edge of the IP in wh-questions can bear:
  ○ LH%
  ○ L%
Adjunct wh-questions: Xinjiang speaker

<table>
<thead>
<tr>
<th>L</th>
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<th>L</th>
<th>H-</th>
<th>L</th>
<th>L%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahinur</td>
<td>qachan</td>
<td>buljurgen-ni</td>
<td>mijiwet-ti</td>
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<tr>
<td>Mahinur</td>
<td>when</td>
<td>strawberry-acc</td>
<td>squeeze-pst.3</td>
<td></td>
<td></td>
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</tbody>
</table>
Adjunct wh-questions: Almaty speaker

<table>
<thead>
<tr>
<th></th>
<th>L</th>
<th>Ha</th>
<th>L</th>
<th>H-</th>
<th>L</th>
<th>LH%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mahinur</td>
<td>qachan</td>
<td>böljürgen-ni</td>
<td>mijiwet-ti</td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Argument wh-questions: Almaty speaker

<table>
<thead>
<tr>
<th>F0 (Hz)</th>
<th>L</th>
<th>H-</th>
<th>L</th>
<th>Ha</th>
<th>L</th>
<th>LH%</th>
</tr>
</thead>
<tbody>
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<td></td>
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<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>böljürgen-ni</th>
<th></th>
<th></th>
<th>mi jiwet-ti</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kim</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>who</td>
<td>strawberry-acc</td>
<td></td>
<td></td>
<td>squeeze-pst.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Argument wh-questions: Almaty speaker

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<td>Kim</td>
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<td></td>
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<td>who</td>
<td>strawberry-acc</td>
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<td></td>
</tr>
</tbody>
</table>

![Spectrogram](image-url)
Polar questions with focused elements

<table>
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<tr>
<th>F0 (Hz)</th>
<th>L</th>
<th>H-</th>
<th>L</th>
<th>LH%</th>
</tr>
</thead>
<tbody>
<tr>
<td>böljürgen-ni-la</td>
<td>Mahinur</td>
<td>mijiwet-ti-mu</td>
<td></td>
<td></td>
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<tr>
<td>strawberry-acc-foc</td>
<td>Mahinur</td>
<td>squeeze-pst.3-q</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Conclusions

- Uyghur intonation is insensitive to stress
- Durational stress may be a Xinjiang feature
- We propose a three-level model of Uyghur intonation that is exclusively edge-marking
Conclusions

Focus:

● H- marking on the focused element
● De-phrasing of following material.
● Focus of a non-subject involves demoting the subject to an AP.

Questions

● Polar questions end in H% or HL% contours
● Wh-questions show properties of both focus and polar questions:
  ○ Wh-word is focused
  ○ Elements to right de-phrased
  ○ The right edge bears L% or LH%.
Future Directions

- Analyze 6 additional Almaty speakers
- Collect more data from Xinjiang speakers
- How many words can fit in an AP?
- Better diagnostics for AP/ip distinction
- Collaborating with Uyghur linguist to tease out semantic/pragmatic contributions of contours
Köp rehmet!!!!

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References


References


References
