ON THE CONTRASTIVE STATUS OF VOWEL LENGTH

WILL OXFORD
UNIVERSITY OF TORONTO
MOT 2012 • MARCH 9

- A typology of length contrasts
- An analysis that captures the properties of each type
A possible typology of the realization of length contrasts

- Realized as “pure” length or as length plus other features
- A continuum of realizations

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Vowel</th>
<th>Length Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geminate vowel language</td>
<td>ii</td>
<td>i</td>
</tr>
<tr>
<td>Long-short language</td>
<td>i:</td>
<td>i</td>
</tr>
<tr>
<td>Mixed language</td>
<td></td>
<td>(aspects of long-short and tense-lax)</td>
</tr>
<tr>
<td>Tense-lax language</td>
<td>i</td>
<td>i</td>
</tr>
</tbody>
</table>

- I will suggest that these types also correlate with merger patterns
1.1 Geminate vowel languages

- /Vː/ and /V/ are distinguished **only by length**
- /Vː/ can be analyzed as /VV/ (e.g. with respect to tone, accent, deletion processes; Trubetzkoy 1939, Pike 1947)
- Need not posit phonemic long vowels; length “contrast” is syntagmatic, simply a matter of word shape
- Likely examples: **Finnish, Japanese**
1.2 Long-short languages

- As in a geminate vowel language, /Vː/ and /V/ are distinguished **only by length**
- However, /Vː/ cannot be analyzed as /VV/
- Must posit phonemic long vowels
- **Kikamba** (Bantu; Roberts-Kohno 2000, cited in Odden 2011)
  - /oː/ and /oo/ are both pronounced [oː]
  - Phonological behaviour distinguishes /oː/ from /oo/:
    - /Vː/ undergoes a shortening rule that /VV/ does not
- **Arapaho-Atsina** (Algonquian; Goddard 1974)
  - Accentual patterns distinguish /ɔː/ from /ɔɔ/
1.3 Tense-lax languages

- /V:/ and /V/ are distinguished by significant quality differences in addition to length (English, German: /i/ vs. /ɪ/)

- But is this really length?

- Phonologically, yes: tense vowels are uncontroversially heavy

- The alternatives [tense] and [ATR] are highly problematic, although [ATR] is appropriate in other languages (Lass 1976, 1984; Fox 2000:30; Ladefoged and Maddieson 1996:302-6)

- “There is apparently still much to be said for the recognition of length itself as the relevant feature” (Fox 2000:31)
1.4 Mixed languages

- Some /Vː – V/ contrasts involve length only, while others involve quality as well

- **Hungarian** (Labov 1994:329)
  - High vowels distinguished purely by length (/iː – i/)
  - Others distinguished by length plus quality (/eː – ɛ/, /aː – ɒ/)

- **Minnesota Ojibwe**: The /oː – o/ contrast involves an overlap in quality; the other vowels do not (Nichols and Nyholm 1995: xxiv-xxv)

  | LONG  | /iː aː oː/ | [iː aː oː~uː] |
  | SHORT | /i a o/    | [i ə~ʌ o~ʊ ]  |

- Geminate vowel (ii / i)
- Long-short (iː / i)
- Mixed
- Tense-lax (i / i)
2 Theoretical assumptions

2.1 Contrast (Drescher 2009)

I take contrastive feature specifications to be determined by successively dividing the inventory according to a hierarchy of features:

(a) [high] > [labial]  
(b) [labial] > [high]

2.2 Merger (Oxford 2011)

Merger is the loss of a contrast, understood in a hierarchical sense

- In (a), merger is predicted to involve the /u, i/ and /ɔ, ɛ/ pairs
- In (b), merger is predicted to involve the /u, ɔ/ and /i, ɛ/ pairs
2.3 The representation of length

- In languages where vowel length is phonemic, it is useful to be able to represent it as a contrast in the inventory.
- I will use the feature $\text{[long]}$ for this purpose.
- I take a phoneme’s status as contrastively $\text{[long]}$ to index an element of its underlying structure:

$$
\begin{align*}
\text{[+long]} & \rightarrow \quad X \quad \mu \\
& \quad \quad \quad \quad \mu
\end{align*}
$$

OR

$$
\begin{align*}
\text{[+long]} & \rightarrow \quad X \quad X \\
& \quad \quad \quad \quad \mu \quad \mu
\end{align*}
$$
3 Analysis of geminate vowel languages (ii / i)

- There is no phonemic length contrast, so [long] is not contrastive.
- Two kinds of “merger” patterns should be possible:
  - **Loss of length** (/aa/ > /a/)
    - **American Finnish:** short-long pairs tend to fall together (Campbell & Muntzel 1989:187)
  - **Parallel mergers** (/a/ > /o/ along with /aa/ > /oo/)
    - **Shuri Japanese:** /e, ee/ > /i, ii/ and /o, oo/ > /u, uu/ (Shibatani 1990:192)
4 Analysis of tense-lax languages (i / ɪ)

4.1 Properties of the English length contrast

What makes English different from a geminate vowel language?

- **Phonetic realization of the length contrast**: more dimensions (duration, peripherality, tension/energy, ATR(?)

- **Patterns of merger and shift**
  - In a geminate vowel language, **quality is more important than length**: vowels of the same quality pattern together (/a/ and /aa/)
  - In English, **length is more important than quality**: the long/tense and short/lax vowels pattern as separate systems
    - **Great Vowel Shift**: raising of long vowels
    - **Canadian Shift**: retraction and lowering of short vowels
    - **pin/pen merger**: short vowels /i, ɛ/ merge
    - **cot/caught merger**: long vowels /a, ɔ/ merge
4.2 Vowel subsystems

The above observations are captured by Labov’s (1994) division of the English vowel system into long and short subsystems:

- **Short**: I U E A æ a
- **Long**: i u e o ə ɔ

According to Labov, subsystems are the domain of:

- Phonetic dispersion
- Chain shifts
- Confusability (→ tendency to merge)
4.3 What are subsystems?

Subsystems are **not simply natural classes**:

- A vowel can belong to more than one cross-cutting natural class (e.g. [high] and [round]), but not to more than one subsystem
- **Subsystems are rigid divisions of the inventory**


- A subsystem is defined by a feature operating at a **higher level of abstractness**
- Subsystems are thus “**indissolubly connected to the notion of hierarchy in linguistic structure**”
- “If all features were at the same level of abstractness, there would be no subsystems”
4.4 Formalizing subsystems

- Labov’s insights find a natural expression in Dresher’s (2009) contrastive hierarchy, as the highest-ranked contrast will always divide the inventory into two separate sub-inventories:

  ![Diagram of contrastive hierarchy]

  - Labov’s “high level of abstractness” can thus be captured as a **high rank in the contrastive hierarchy** for the subsystem-defining feature.

**PROPOSAL:**
A tense-lax system involves a high ranking of the length contrast.
4.5 Deriving the properties of the English length contrast

• Merger and shift are confined to subsystems: ✔
  o Under the hierarchical approach, a phoneme always contrasts more directly with other members of its own subsystem
  o Therefore, if merger and shift involve the loss or reorganization of contrasts, they should naturally be confined to one subsystem

• Length is realized using multiple phonetic dimensions: ✔??
  o Perhaps higher-ranked contrasts can marshal more phonetic dimensions in their realization (Labov’s “abstractness”)
  o Lower-ranked contrasts, on the other hand, may be tied to the particular feature that determines the contrast
The remaining proposals are obvious:

- **Long-short languages** → low rank of the length contrast
- **Mixed languages** → intermediate rank of the length contrast
5 Analysis of long-short languages (i: / i)

- **Analysis:** length contrast has lowest rank
- **Result:** vowels are grouped into long-short pairs (opposite of subsystems)
  
  \[
  \text{[low]} > \text{[labial]} > \text{[long]}
  \]

- **Predictions (same as geminate vowel language):**
  - Phonetic realization should involve length only
  - Mergers predicted to pattern as in geminate vowel languages:
    - **Loss of length** (lose lowest contrast): /oː/ > /o/
    - **Parallel mergers** (lose next-lowest contrast): /o, oː/ > /i, iː/
      
      (attested in **Arapaho-Atsina**; Goddard 1974)
Analysis of mixed languages

- **Analysis:** Intermediate rank of length contrast
- **Ojibwe** (ranking of quality features from Oxford 2011)
  \[
  \text{[labial]} > \text{[long]} > \text{[coronal]} > \text{[low]}
  \]

- **Round vowels** = long-short; non-round vowels = tense-lax
- Reflected in the phonetics: /oː–o/ pair overlaps in quality, others don’t
- Also reflected in **merger patterns** in closely-related Potawatomi:
  - Short /i, a/ merge with each other; short /o/ merges with long /oː/
I have proposed a model that links the properties of length contrasts to the hierarchical rank (or “abstractness”) of the contrast:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geminate vowel language</td>
<td>No (phonemic) length contrast</td>
</tr>
<tr>
<td>Long-short language</td>
<td>Low rank of length contrast</td>
</tr>
<tr>
<td>Mixed language</td>
<td>Intermediate rank of length contrast</td>
</tr>
<tr>
<td>Tense-lax language</td>
<td>High rank of length contrast</td>
</tr>
</tbody>
</table>

The ranking of the length contrast has been proposed to correlate with:

- The phonetic realization of the contrast
- The patterning of mergers and shifts

Just an idea at this point – much work required to test these predictions!
Acknowledgments

Thanks to Peter Avery for encouraging me to pursue this idea and to Christopher Spahr for sharing much thought-provoking discussion. All missteps in this work are, of course, mine.

References


Shibatani, Masayoshi. 1990. The Languages of Japan. Cambridge UP.
