ON THE CONTRASTIVE STATUS OF VOWEL LENGTH

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

1 Toward a typology of vowel length contrasts

- A possible typology of the **realization** of length contrasts
- Realized as **"pure" length** or as **length plus other features**
- A **continuum** of realizations

TYPE	
Geminate vowel language	ii / i
Long-short language	iː / i
Mixed language	(aspects of long-short and tense-lax)
Tense-lax language	i / ɪ

- I will suggest that these types also **correlate with merger patterns**

- Geminate vowel (ii / i)
- Long-short (i: / i)
- Mixed
- Tense-lax (i / ɪ)

1.1 Geminate vowel languages

- **/V:/** and **/V/** are distinguished **only by length**
- **/V:/** 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**

- Geminate vowel (ii / i)
- Long-short (i: / i)
- Mixed
- Tense-lax (i / ɪ)

1.2 Long-short languages

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

- Geminate vowel (ii / i)
- Long-short (i: / i)
- Mixed
- Tense-lax (i / ɪ)

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)**

- Geminate vowel (ii / i)
- Long-short (iː / i)
- Mixed
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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)

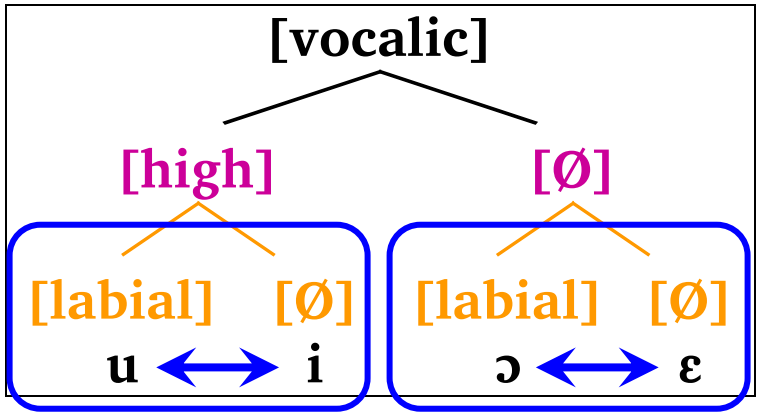
LONG	/iː	aː	oː/	[iː	aː	oː~uː]
SHORT	/i	a	o/	[ɪ	ə~ʌ	o~ʊ]

2 Theoretical assumptions

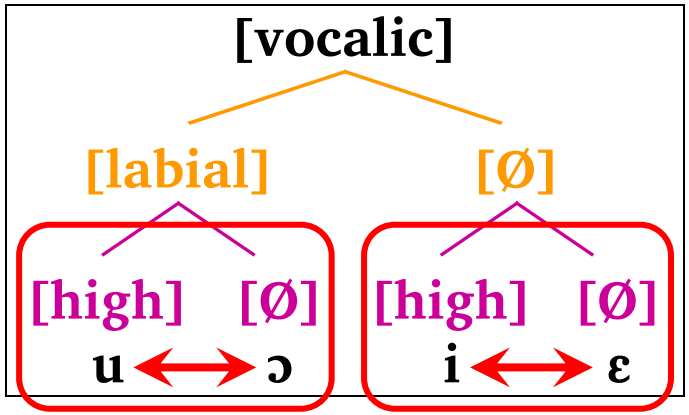
2.1 Contrast (Dresher 2009)

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]



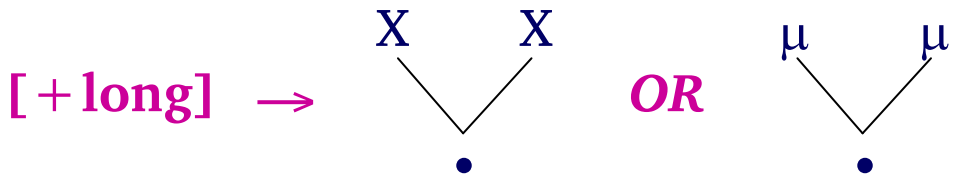
2.2 Merger (Oxford 2011)

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 **[long]** for this purpose
- I take a phoneme's status as contrastively **[long]** to index an element of its underlying structure:



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 **/ɪ, ɛ/** merge
    - ***cot/caught* merger:** long vowels **/ɑ, 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		long		
ɪ	ʊ	i		u
ɛ	ʌ	e		o
æ	ɒ		ɑ	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**:

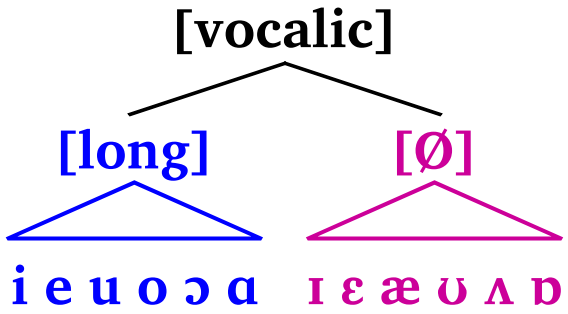
- A vowel can belong to more than one cross-cutting natural class (e.g. [high] and [round]), but not to more than one subsystem
- **Subsystems are rigid divisions of the inventory**

According to Labov (1994:271):

- 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

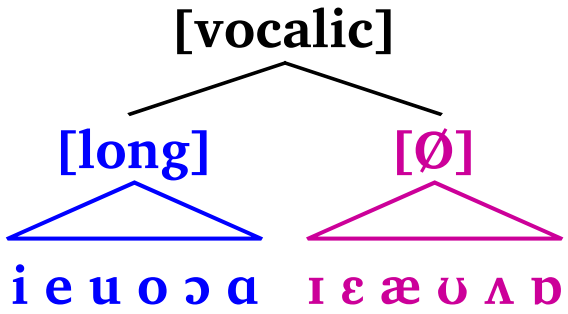
- Labov's insights find a natural expression in Dresher's (2009) contrastive hierarchy, as the highest-ranked contrast will always divide the inventory into two separate sub-inventories:



- 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:** ✓
  - Under the hierarchical approach, a phoneme always contrasts more directly with other members of its own subsystem
  - 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:** ✓??
  - Perhaps higher-ranked contrasts can marshal more phonetic dimensions in their realization (Labov's "abstractness")
  - Lower-ranked contrasts, on the other hand, may be tied to the particular feature that determines the contrast

Interim summary

TYPE	ANALYSIS
Geminate vowel language	No (phonemic) length contrast
Long-short language	**Low rank**
Mixed language	**Intermediate rank**
Tense-lax language	High rank of length contrast

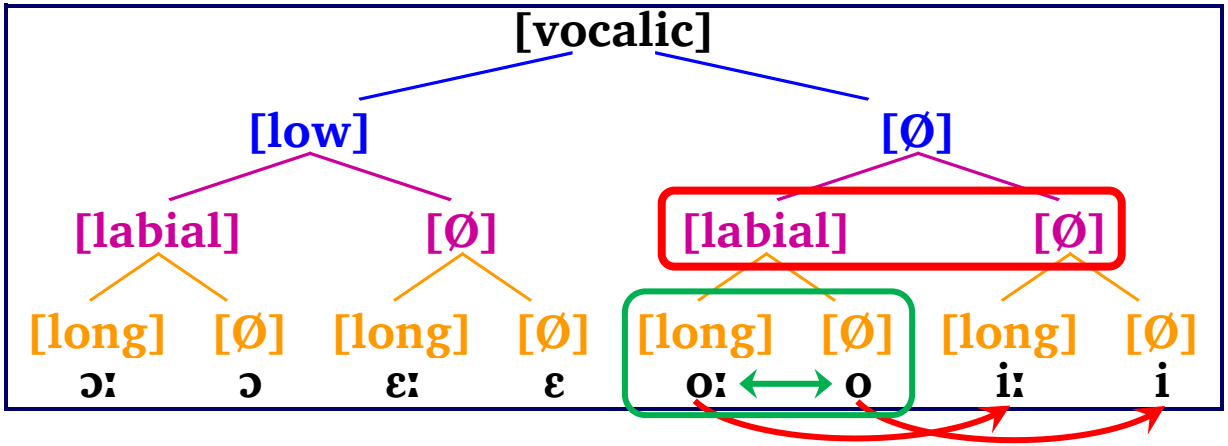
The remaining proposals are obvious:

- **Long-short languages** → low rank of the length contrast
- **Mixed languages** → intermediate rank of the length contrast

5 Analysis of long-short languages (iː / i)

- **Analysis:** length contrast has lowest rank
- **Result:** vowels are grouped into long-short pairs (opposite of subsystems)

[low] > [labial] > [long]

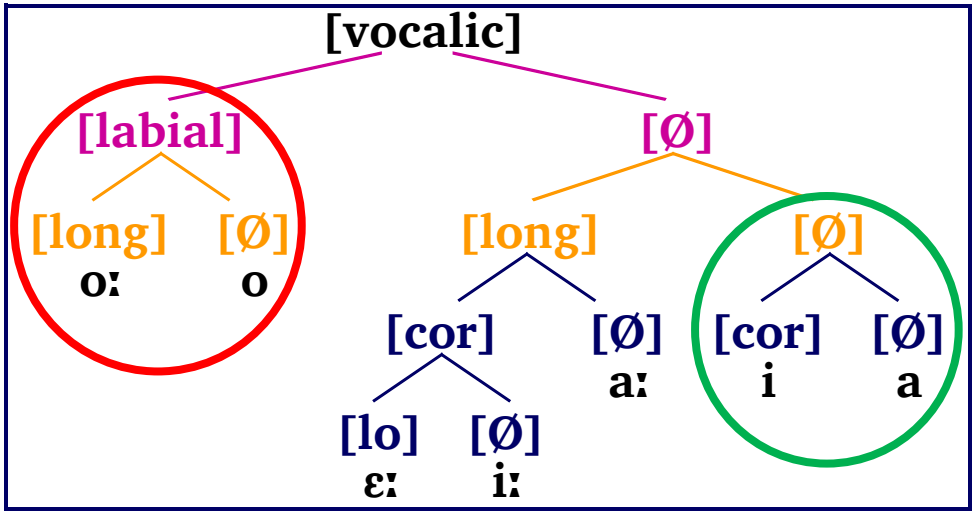


- **Predictions (same as geminate vowel language):**
  - Phonetic realization should involve length only
  - Mergers predicted to pattern as in geminate vowel languages:
    - **Loss of length** (lose lowest contrast): /oː/ > /o/
    - **Parallel mergers** (lose next-lowest contrast): /o, oː/ > /i, iː/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

6 Analysis of mixed languages

- **Analysis:** Intermediate rank of length contrast
- **Ojibwe** (ranking of quality features from Oxford 2011)

  [labial] > **[long]** > **[coronal]** > **[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/**

7 Conclusion

I have proposed a model that links the properties of length contrasts to the hierarchical rank (or "abstractness") of the contrast:

TYPE	ANALYSIS
Geminate vowel language	No (phonemic) length contrast
Long-short language	Low rank of length contrast
Mixed language	Intermediate rank of length contrast
Tense-lax language	High rank of length contrast

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

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