**Underlying Contrasts and East Slavic Post-Velar Fronting**

### Introduction
What caused the fronting of /i/ to /i/ between the 12th and 14th centuries in East Slavic? Everyone agrees that the lack of contrast between /i/ and /i/ is crucial. Padgett (2003) argues it was motivated also by the surface difference between /i/ and /u/. I argue, following Jakobson (1929), that the trigger was the reanalysis of underlying vowel contrasts, whereby the phoneme /i/ became a positional allophone of /i/. A issue is the proper way to incorporate contrast into phonology.

### Slavic Sound Changes

#### Prior to Changes
/i/ and /i/ are separate phonemes. /i/ and /u/ occur before all vowels.

#### Post-Velar Fronting (East Slavic)
What caused /i/ to front to /i/?

### Dispersion Theory Analysis
Padgett (2003) looks at surface phonetic contrasts and proposes that the key to the change of /i/ to /i/ is that /i/ makes a better perceptual contrast with /u/ than does /i/.

**SPACE constraint for East Slavic (Padgett 2003):**

\[
\text{SPACE}_{\text{Colour}} \geq 1/2: \text{Potential minimal pairs differing in vowel color differ by at least 1/2 of the full vowel color range.}
\]

**Before Post-Velar Fronting**
At Stage 6 on the left it is more important to preserve the underlying vowel colour than to maximize dispersion:

\[
\begin{align*}
\text{Stage 6:} & /p_1/ \text{ becomes an allophone of } /k_1/ \text{, so it will not neutralize with } /u_1/ \\
& \text{Post-Velar Fronting is due to a weakening of the IDENT and SPACE constraints. *MERGE} & & \text{IDENT (COLOUR)} & \text{SPACE (COLOUR)} \\
& \text{The surface loss of short high front and back vowels (set) made palatalization opaque and led to a reanalysis of palatalized consonants as underlying.} & & \ast & \ast \\
& \text{/i/} & & \ast & \ast \\
& \text{Palatalization} & & \ast & \ast \\
& \text{Surface} & & \ast & \ast \\
& & & & \text{Note that } /i/ \text{ but not } /i/ \text{ is considered } \text{paired, i.e. contrastive for } /k_1/ \text{? This cannot be explained by minimal pairs. However, it follows from the East Slavic contrastive hierarchy given below.} \\
& & & & \text{Stage 5: Vowels and paired consonants contrastively } /k_1/ \text{.} \\
& & & & \text{Stage 6: } /i/ \text{ becomes an allophone of } /i/ \text{.} \\
\end{align*}
\]

### Problems with the Analysis
- To implement this idea formally, Padgett must limit the analysis in non-neutralized ways (e.g. extreme idealizations):
  - only a specifically chosen set of words can be considered
  - only one space dimension (Colour) can be considered
- Minimal pairs are determined on the surface. According to Padgett's definition:
  - /i/ and /u/ differ only in the vowel and are a minimal pair. But...
  - /i/ and /k/ differ in the vowel and the consonant and are not a minimal pair. Therefore, the SPACE constraint should not apply.
- No principled reason for treating the velars (represented by /k/) differently from the labials and coronals (represented by /p/, except for /t/).
- The analysis disregards the phonemic status of the vowels, unlike Jakobson's analysis.

### Modified Contrastive Specification
In MCS (Dresher, Piggott and Rice 1994, Dresher and Rice 2007, Dresher 2009), the appropriate level at which minimal contrast holds is at the underlying phonemic level. Contrastive features must be assigned in an order, following language-particular contrastive hierarchies.

**Stage 4: Contrastively }[-back] word pairs palatalize consonants**

**Stage 5: Vowels and paired consonants contrastively }[-back]**

**Stage 6: }/[–back] becomes an allophone of }/[–back]**

The reanalysis of /i/ requires the introduction of }+[+back]. No surface forms from Stage 5 are affected except the velars: lacking a contrastive }+[+back] specification, /k/ cannot back /, which palatalizes it instead. Post-Velar Fronting is a consequence of this reanalysis.

**Contrastive feature hierarchy for East Slavic**

\[
[\text{sonorant}] > \text{Major Place} > [\text{voiced}] > [\text{continuant}] > \text{back} > \text{coronal features}
\]

**Contrastive specifications of some consonants**

\[
\begin{align*}
\text{p} & \quad \text{[–sonorant]} \\
\text{t} & \quad \text{[–sonorant]} \\
\text{tʃ} & \quad \text{[–sonorant]} \\
\text{k} & \quad \text{[–sonorant]} \\
\end{align*}
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