Conflicting Repairs in Native and Foreign Vocabulary

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Problem: Cases in which

1. The native language lacks a particular structure.

2. The native language uses a productive process to repair the illegal structure.

3. A different strategy is used to repair this illegal structure in foreign words.
Proposal

In these cases, the conflicting repair represents misperception of the foreign structure.

- Case 1: Malayalee English: repair of VkV
- Case 2: Korean loanwords: repair of VlV
Malayalam Stop Phonemes (Asher & Kumari 1997)

• In native vocabulary, $[p, t, t, t, c, k]$ (no laryngeal contrasts).

• Singleton and geminate consonants contrast in medial position.
Malayalam Intervocalic Voicing

Voiceless singleton stops become voiced intervocalically:

/ma\kan/ > [magan] ‘son’

(Voicing may be accompanied by lenition (Asher & Kumari 1997): /ma\kan/ > [mayan])
Only singletons undergo voicing

/makan/ > [magan] ‘son’

/cakka/ > [cakka] ‘jackfruit’
How are English intervocalic stops realized in Malayalee English?
Malayalee English
(Mohanan & Mohananan 2003)

English intervocalic **voiced** stops > **voiced**:

- `iɾiɡeet` ‘irrigate’
- `fiɡaɾ` ‘figure’
- `bæːbuːn` ‘baboon’
English voiceless stops? (*VkV in Malayalam)

Prediction: intervocalic voiceless stops could be

a) repaired by productive native language process of intervocalic voicing
(‘baker’ > [beg\textcolor{red}{\textit{ar}}]); or

b) preserved (‘baker’ > [be\textcolor{red}{\textit{kar}}]).
English intervocalic voiceless stops > voiceless geminates

bekkar  'baker'
pæ:kket  'packet'
ripopo:  'report'
Malayalam and Malayalee English grammars conflict

Malayalam ranking:
*VkV>>Ident(length) >> Ident(voice)
/VkV/ > [VgV]

Malayalee English Ranking:
*VkV>>Ident(voice) >> Ident(length)
/VkV/ > [VkkV]
## Malayalam Grammar

<table>
<thead>
<tr>
<th>/VkJ/</th>
<th>*VkV</th>
<th>Ident(length)</th>
<th>Ident(voice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. VkJ</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. VkkV</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>&gt;c. VgV</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
# Malayalee English Grammar

<table>
<thead>
<tr>
<th>/VkV/</th>
<th>*VkV</th>
<th>Ident(voice)</th>
<th>Ident(length)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>VkV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;b.</td>
<td>VkkV</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c.</td>
<td>VgV</td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>

The table above shows the grammar rules for Malayalee English, where /VkV/ represents the initial phonetic sound, *VkV* indicates a specific voice pattern, and Ident(voice) and Ident(length) are phonetic identifications for voice and length, respectively.
Learnability problem

What evidence would have been available to Malayalam speakers for reranking of length faithfulness and voicing faithfulness?

• No evidence from Malayalam
• No evidence from English
Possible Unified Grammar

Ident(voice)-Foreign, *VkV >>
Ident(length) >> Ident(voice)

• Voicing preserved in foreign forms
• Length preserved in native forms
Source of this ranking?

General assumption: default ranking = M >> F
(Prince & Tesar 2004, Hayes 2004)

Possible default ranking: Ident-foreign, M >> F
But foreign voicing specification is not always preserved

‘possible’ > [pɔ:sibl]
‘impossible’ > [imˈbɔ:sibl]

Malayalee English ranking:

*NC[-voice] >> Ident(voice)Foreign, *VkV >> Ident(voice)

(Ident-foreign cannot always be ranked high)
Alternative Analysis: Misperception

Malayalam speakers interpreted English contrast in terms of Malayalam contrast

English | Malayalam
---|---
[VkV] | [VkkV] < /VkkV/
[VgV] | [VgV] < /VkV/
Is this analysis consistent with the acoustics of the 2 languages in contact?
Malayalam ancillary cues to length contrast

Local & Simpson 1999:

1. Voicing: intervocalic singletons have voicing during closure.

2. Vowel duration: vowels are longer before singletons. Mean V duration:
   - 76.5 msec before singletons
   - 58.8 msec before geminates

(among other cues)
English ancillary cues to voicing contrast

1. Voicing: voiced stops have voicing during closure (e.g., Lisker 1986).

2. Duration: vowels are longer before voiced consonants (e.g., Kluender, Deal, & Wright 1988).

(among other cues)
Cue Confusion

English [VkV] vs. [VgV]:
  lack of closure voicing > voiceless consonant.
  shorter pre-C vowel > voiceless consonant.

Malayalam [VkkV] vs. [VgV] (</VkV/>):
  lack of closure voicing > geminate consonant.
  shorter pre-C vowel > geminate consonant.
No Conflict

Malayalee English pattern can be understood as misperception of English structures:

\[VkV\] interpreted as \[VkkV\].

Perception: \[VkV\] heard as \[VkkV\]
Production: /VkV/ => [VgV], /VkkV/ => [VkkV]
Acoustic Form

Phonological Representation
(perception)

Phonicetic Representation
(production)
Case 2

Conflicting repairs in Korean native vocabulary vs. adaptation of English words
Korean Liquid Phonemes:
/r/ and /l/ do not contrast

/r/ occurs in syllable onset
(word-initially and between vowels)

/l/ occurs in syllable coda
(word-finally and before a consonant)
Korean Liquid Alternation (Lee 2001)

a. /l/

- ta|l ‘moon’
- ma|l ‘horse’
- sa|l.ku ‘apricot’

b. /r/ (tap)

- ta.|r-i ‘moon (nom.)’
- ma.|r-i ‘horse (nom.)’
- sa.|ram ‘person’
• How are intervocalic liquids adapted in loanwords?
Korean Adaptation of medial [r]
(Kenstowicz 2005, Oh 2005, among others)

intervocalic ‘r’ > [r]

\[
\begin{align*}
\text{kʰo:rasі} & \quad \text{‘chorus’} \\
\text{orenʒi} & \quad \text{‘orange’} \\
\text{misіtʰeri} & \quad \text{‘mystery’}
\end{align*}
\]
Intervocalic [l]? (*[VlV] in Korean)

Prediction: Intervocalic [l] could be

a) repaired by productive native language process of tapping (‘Cola’ > [kʰora]), or

b) preserved (‘Cola’ > [kʰola])
Korean Adaptation of medial [l] (Kenstowicz 2005, Oh 2005, others)

Intervocalic /l/ → [ll]

- chello → ‘cello’
- silliikhon → ‘silicon’
- khoilla → ‘cola’

Some Doublets: ‘kilo’ → [kiro], [killo]
Orthography not determining factor

Oh (2005):

- orthographic ‘ll’ > [ll] 99.9%
- orthographic ‘l’ > [ll] 84%

Strong trend toward [ll], regardless of spelling.
Conflict in native and foreign repairs

Native Language ranking:
*nonmoraic[l] >> \textbf{Ident(length)} >> Ident(lat)

Loanword Ranking:
*nonmoraic[l] >> Ident(lat) >> \textbf{Ident(length)}

Problem: no evidence to support this reranking.
Alternative analysis:
Adaptation represents misperception

English [r]-[l] contrast interpreted in terms of Korean [r]-[ll] contrast.

mu.ɾi  ‘group’  muɬ.ɬi  ‘physics’
mə.ɾi  ‘head’  məɬ.ɬi  ‘far’
Korean [r]-[ll] contrast: cues

1. presence/absence of laterality
2. consonant duration

\[ m_{r}i = [-\text{lateral, short}] \quad \text{‘group’} \]
\[ m_{l}l_{l}i = [+\text{lateral, long}] \quad \text{‘physics’} \]
But: Duration is not a useful cue

Oh 2005: English onset [l] durations averaged between Korean [l] and [r].

O’Connor et al. 1957, Underbakke et al. 1988, Polka and Strange 1985: English (initial) [r] is longer (longer F1 transition) than [l].

<table>
<thead>
<tr>
<th>Korean</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>VrV</td>
<td>VrV</td>
</tr>
<tr>
<td>shorter</td>
<td>longer</td>
</tr>
<tr>
<td>[-lat]</td>
<td>[-lat]</td>
</tr>
<tr>
<td></td>
<td>[+lat]</td>
</tr>
</tbody>
</table>
Laterality

Kim (2007) suggests that laterality is the dominant cue.

Subjects: speakers of Korean, minimal English proficiency
Kim (2007) Stimuli

1. Real words containing VllV, e.g. [mulli].

2. Real words containing VrV, e.g. [muri].

3. Nonwords containing VlV, e.g. [*mulii], produced by shortening the [l] in VllV words.
Kim (2007) Task

Listeners heard stimuli such as [muri] (real word), [mulli] (real word), [*mulli] (nonword).

Forced choice for nonword: Did you hear ‘muri’ (‘group’) or ‘mulli’ (‘physics’)?
Results

[VLV] identified as

<table>
<thead>
<tr>
<th>[VIIV]</th>
<th>324</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>[VrV]</td>
<td>36</td>
<td>10%</td>
</tr>
</tbody>
</table>
Kim (2007) results suggest that duration is not the major cue for the [r]-[ll] contrast. Laterality is sufficient to cue this contrast.
Is laterality still the dominant cue with
  a. nonwords?
  b. stimuli that include long nonlateralts?
  c. participants with greater familiarity with English?
1. Identification Experiment

Subjects: 10 NSs of Korean residing in US
Identification Stimuli

1. Nonsense word containing \( VllV \) \([elle]\)

2. Nonsense word containing \( VrvV \) \([ere]\)

3. Nonsense illegal word containing \( VllV \) \([ele]\) produced by shortening the \([l]\) in \( VllV \) words.

4. Nonsense illegal word containing \( VrrrV \) \([erre]\)
Listeners heard (edited) words like [ele] or [erre].

Forced choice: Did you hear [ere] or [elle]?
# Identification Results

<table>
<thead>
<tr>
<th></th>
<th>Stimuli</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>elle</td>
<td>200</td>
<td>1</td>
<td>198</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>ere</td>
<td>0</td>
<td>199</td>
<td>2</td>
<td>194</td>
</tr>
<tr>
<td>Answer</td>
<td>edited elle</td>
<td></td>
<td></td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>erre</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>
Identification Results


Koreans classify [erre] (non-lateral, long) as [ere] (non-lateral) rather than [elle] (long).

2. Discrimination Experiment

AXB: Listeners heard three words and decided whether the second word sounds similar to the first word or the third.

e.g., elle-ere-ere
elle-elle-ele
If duration and laterality are *equally important*,

<table>
<thead>
<tr>
<th>Pair</th>
<th>Duration</th>
<th>Laterality</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>elle-ere</td>
<td>diff</td>
<td>diff</td>
<td>best</td>
</tr>
<tr>
<td>elle-ele</td>
<td>diff</td>
<td></td>
<td>bad</td>
</tr>
<tr>
<td>erre-ere</td>
<td></td>
<td></td>
<td>bad</td>
</tr>
<tr>
<td>ele-ere</td>
<td></td>
<td>diff</td>
<td>bad</td>
</tr>
<tr>
<td>elle-erre</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Prediction

- If duration is **less important** than laterality,

<table>
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<tr>
<th>Pair</th>
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<th>Laterality</th>
<th>Accuracy</th>
</tr>
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<tbody>
<tr>
<td>elle-ere</td>
<td>diff</td>
<td>diff</td>
<td>best</td>
</tr>
<tr>
<td>elle-ele</td>
<td>diff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>erre-ere</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ele-ere</td>
<td></td>
<td>diff</td>
<td>bad</td>
</tr>
<tr>
<td>elle-erre</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Discrimination Results

Laterality alone (but not duration alone) cues the contrast as well as laterality plus duration.

<table>
<thead>
<tr>
<th>Pair</th>
<th>Duration</th>
<th>Laterality</th>
<th>Accuracy%</th>
</tr>
</thead>
<tbody>
<tr>
<td>elle-ere</td>
<td>diff</td>
<td>diff</td>
<td>97.5%</td>
</tr>
<tr>
<td>elle-ele</td>
<td>diff</td>
<td></td>
<td>85.5%</td>
</tr>
<tr>
<td>erre-ere</td>
<td>diff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ele-ele</td>
<td>diff</td>
<td></td>
<td>98.0%</td>
</tr>
<tr>
<td>elle-erre</td>
<td>diff</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary

Conflicting repairs:

Malayalam: \(V_k V > V_g V\)
Malayalee English: \(V_k V > V_{kkV}\)

Korean: \(V_l V > V_r V\)
English loans: \(V_l V > V_{llV}\)
Conclusion

• There is no conflict! The native language production grammar specifies a single repair.

• The apparent conflict results from the assumption that listeners perceive the foreign form accurately. But listeners interpret FL cues in terms of NL contrasts.
Thank you!

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