ASYMMETRIES IN FOREIGN LANGUAGE PERCEPTION AND PRODUCTION

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1. Introduction

OT differs from many other models in its approach to

1. Learnability.
2. Lexical representations.
Learnability

OT defines both

Possible Grammars: Set of possible rankings.

Learnable Grammars: Set of rankings that could be learned from ambient data via an error-driven algorithm.
Lexical representations

- Richness of the Base: no restrictions on lexical entries (e.g., no mandatory underspecification).

Goal of this talk

To consider foreign language adaptation patterns which may appear to be incompatible with these assumptions.

To argue that the correct analyses of these patterns actually support classical OT assumptions of learnability and unconstrained lexical representations.
1. Learnability:

In two cases in which NL repair ≠ FL repair, and FL production grammar appears unlearnable,

FL repair reflects transfer of NL perception grammar.
2. Lexical representations:

FL patterns do not support minimal specification of phonological features.

Asymmetric perception of the FL reflects asymmetries in acoustic signal rather than in phonological representation.
Part 1: Learnability

Cases of Interest:

NL repair strategy differs from repairs used for foreign structures.

Case 1: Malayalam and Malayalee English

Case 2: Korean liquid alternations and adaptation of English liquids
Native vocabulary: Contrasts in

- **Place:** [p, t, t̂, c, k].
- **Duration:** singleton vs. geminate.
- **No laryngeal contrasts, though singletons are voiced intervocalically:**
  
  /makan/ > [magan] ‘son’
Only singletons undergo voicing

/cakka/ > [cakka] ‘jackfruit’

/makan/ > [magan] ‘son’

(Voicing may be accompanied by lenition (Asher & Kumari 1997): /makan/ > [maɣan])
English voiced stops > voiced stops

i'igeet
figa
baææbuun
‘irrigate’
‘figure’
‘baboon’
Malayalee English

English voiceless stops > voiceless geminates

- bekkar
- pææekket
- riippoort

‘baker’
‘packet’
‘report’
Malayalee English restriction: *V[-voi]V

Malayalam repair: Voicing

\[ \text{makan} > \text{magan} \]

Malayalee English repair: Gemination

\[ \text{‘baker’} > \text{bekkar} \]
## Malayalam Grammar

<table>
<thead>
<tr>
<th>/VkV/</th>
<th>*V[-voi]V</th>
<th>Ident(μ)</th>
<th>Ident(voice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. VkV</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>*V[-voi]V</th>
<th>Ident(voice)</th>
<th>Ident(μ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. VkV</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;b. VkkV</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>c. VgV</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
</tbody>
</table>
Learnability problem

What is the source of the Malayalee English ranking?
Initial state = First language grammar (e.g., Schwartz & Sprouse 1994)
“Faute de what?”

“Mieux, m’lord. A French expression.”

“What asses these Frenchmen are! Why can’t they talk English?”

“They are possibly to be more pitied than censured, m’lord. Early upbringing no doubt has a good deal to do with it.”
Second Language Acquisition

Initial State (NL Grammar)

Foreign Language Input

Interlanguage Grammar (New rankings)
What evidence would have been available to Malayalam speakers to motivate reranking of \text{Ident}(\mu) >> \text{Ident}(\text{voice})? 

English offers evidence for demoting \*V[-voi]V, but not for demoting \text{Ident}(\mu).
If Malayalee English ranking is not learnable from originally available data, could it represent a default ranking?
Possible Unified Grammar

A highly-ranked foreign-specific faithfulness constraint could preserve voicing in foreign forms only.

\[
\text{Ident(voice)Foreign, } *V[-voi]V >> \text{Ident(μ) >> Ident(voice)}
\]
Perhaps this ranking need not be learned?

Hayes 2004: default ranking =

(O-O)Faith >> M >> (I-O)Faith
BUT: foreign voicing specification is NOT always preserved

**Malayalee English**

‘possible’ > \[p:\text{si}bL\]

‘impossible’ > \[im\text{b}o:\text{si}bL\]
The default ranking O-O>>M fails for certain constraints

Malayalee English ranking:

*NC[-voice] >> Ident(voice)Foreign, *V[-voi]V >> Ident(voice)
M >> (O-O)Faith, M >> (I-O)Faith

⇒ Ident-Foreign constraints cannot always be ranked high; crucial rankings must be learned.
Interim Summary

The grammar required to analyze Malayalee English adaptation...

> ≠ NL grammar;
> does not appear to reflect default rankings;
> is not learnable from English data.
Source of the Problem

The learnability problem arises from the assumption that listeners accurately perceive the foreign forms.
Alternative Analysis: Misperception

<table>
<thead>
<tr>
<th>English</th>
<th>heard as</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>VkV</td>
<td>VkkV</td>
<td>VgV</td>
</tr>
<tr>
<td>VgV</td>
<td>(&lt;VkkV/)</td>
<td>VgV</td>
</tr>
</tbody>
</table>

Is this consistent with the acoustic cues to these contrasts?
Cues to presence of geminates in Malayalam (Local & Simpson 1999)

1. Consonant voicing:
   Intervocalic geminates (vs. singletons) lack voicing during closure.

2. PreC vowel duration:
   Mean V duration:
   58.8 msec before geminates
   76.5 msec before singletons
Characteristics of voiceless stops in English

1. Consonant voicing:
   Voiceless stops lack voicing during closure (e.g., Lisker 1986).

PreC vowel duration:
Vowels are shorter before voiceless than before voiced consonants (e.g., Kluender, Deal, & Wright 1988).
Misleading Cues

English V{k}V vs. V{g}V:
- lack of voicing $\rightarrow$ voiceless.
- shorter pre-C vowel $\rightarrow$ voiceless.

Malayalam V{k}{k}V vs. V{g}V:
- lack of voicing $\rightarrow$ geminate.
- shorter pre-C vowel $\rightarrow$ geminate.
Perception Grammar

English (Boersma 2007)
* /-son, -voi/ [lengthened vowel]
* /-voi/ [periodic]

Malayalam
* /singleton/ [shortened vowel]
* /singleton/ [lack of periodicity in intervocalic position]
Transfer of perception grammar

The acoustic properties of intervocalic voiceless stops in English parallel the cues indicating gemination in Malayalam.

Therefore, the Malayalam perception grammar encourages interpretation of English $VkV$ as $VkkV$. 
Learnability Problem:

NL repair $\neq$ FL repair

Case 2: Korean adaptation of English liquids
Korean Liquid Alternation (Lee 2001)

a. /l/ in coda
   tal  ‘moon’
   mal  ‘horse’
   salku  ‘apricot’

b. /r/ (tap) in onset
   tar-i  ‘moon (nom.)’
   mar-l  ‘horse (nom.)’
   saram  ‘person’
Korean Adaptation of medial [r] (Kenstowicz 2005, Oh 2005, among others)

intervocalic ‘r’ > [r]

kʰɔɾasɨ ‘chorus’
oɾenʒi ‘orange’
misɨθʰerɨ ‘mystery’
Korean Adaptation of medial [l] (Kenstowicz 2005, Oh 2005, etc.)

intervocalic /l/ > [ll]

cʰello ‘cello’ *[cʰ ero]
sillikʰon ‘silicon’ *[sirikʰ on]
kʰolla ‘cola’ *[kʰ ora]

(some doublets: ‘kilo’ > [kiro], [killo])
Korean restriction: *VIV

NL repair:  VIV > VrV
   mul+i > muri

Foreign repair:  VIV > VIIV
   'cola' > kʰolla
## NL production grammar

<table>
<thead>
<tr>
<th>/mul+i/</th>
<th>[l]=moraic</th>
<th>Ident(μ)</th>
<th>*r</th>
<th>Ident(lat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; a. muri</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b. muli</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. mulli</td>
<td></td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Loanword grammar

<table>
<thead>
<tr>
<th>/kʰola/</th>
<th>[l]=moraic</th>
<th>Ident(lat)</th>
<th>*r</th>
<th>Ident(µ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kʰora</td>
<td>* !</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. kʰola</td>
<td>*!</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; c. kʰolla</td>
<td></td>
<td></td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>
Learnability problem, again

Native Language ranking:

$[l] = \text{moraic} \gg \text{Ident}(\mu) \gg \text{Ident}(\text{lat})$

Interlanguage Ranking:

$[l] = \text{moraic} \gg \text{Ident}(\text{lat}) \gg \text{Ident}(\mu)$

But English does not provide data to motivate this reranking.
Possible Unified Grammar?

Kenstowicz 2005 proposes foreign-specific faithfulness

e.g.,

\[ [l] = \text{moraic} >\rightarrow \text{Ident(lat)Foreign} >\rightarrow \text{Ident(}\mu) >\rightarrow \text{Ident(lat)} \]

\[ M >\rightarrow \text{ForeignFaith} >\rightarrow F >\rightarrow F \]
Rankings that must be explained

1. M >> ForeignFaith: $[l]=$moraic >> Ident(lat)

2. ForeignFaith >> ForeignFaith (Kenstowicz 2005)
   
   ‘hotel’ > [hotʰeI]
   ‘gear’ > [kiə]

   (assumption: English coda [r] is [-cons])

Ident(-cons)Foreign >> Ident(cor)Foreign, Ident(lat)Foreign
3. $M \gg (\text{Foreign?})\text{Faith} \gg \text{Foreign Faith}$

(Kenstowicz 2005):

‘rope’ $> \left[ r o p^{h\ddot{i}} \right]$

‘lobby’ $> \left[ r o b i \right] \ast \left[ ìllobi \right]$

$[l]=\text{moraic} \gg \text{DEP(V)} \gg \text{Ident(lat)-Foreign}$
Alternative Analysis: Misperception

<table>
<thead>
<tr>
<th>English</th>
<th>heard as</th>
<th>Korean</th>
</tr>
</thead>
<tbody>
<tr>
<td>VrV</td>
<td>VrV</td>
<td>VrV</td>
</tr>
<tr>
<td>VIV</td>
<td>VIIIV</td>
<td></td>
</tr>
</tbody>
</table>

Is this consistent with the acoustic cues to these contrasts?
Korean [ɾ]-[ll] contrast: cues

1. laterality (Kim 2007: [l] has higher F3, [ɾ] has lower F3)
2. consonant duration

μɾi ‘group’ = [-lateral, short]
μllɨi ‘physics’ = [+lateral, long]
Conflicting Cues

To hear English VIV as VIIV, Korean listeners must ignore durational mismatch.

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

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

1. Nonsense (possible) words containing VIIV, VrV.

2. Nonsense (impossible) words containing VIV, VrrV, created by shortening VIIV, doubling tap in VrV.

[elle], [ere], *[ele], *[erre]
Hypothesis: Korean listeners will identify VIV as VIIV (weighting laterality cues over durational cues).
Identification Experiment
(Broselow, Hwang, & Squires 2009)

Subjects: 10 NS of Korean residing in US (good knowledge of English).

Stimuli: elle, ere, *ele, *erre

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

<table>
<thead>
<tr>
<th>Answer</th>
<th>elle</th>
<th>ele</th>
<th>ere</th>
<th>erre</th>
</tr>
</thead>
<tbody>
<tr>
<td>elle</td>
<td>200</td>
<td>198</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>ere</td>
<td>0</td>
<td>2</td>
<td>199</td>
<td>194</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>
### Discrimination
(Broselow, Hwang, & Squires 2009)

**AXB: e.g., elle-ere-ere or elle-elle-ele**

<table>
<thead>
<tr>
<th>Pair</th>
<th>Mean Accuracy</th>
<th>Cue</th>
</tr>
</thead>
<tbody>
<tr>
<td>elle - ere</td>
<td>97.5%</td>
<td>lat + dur</td>
</tr>
<tr>
<td>ele – ere</td>
<td>98%</td>
<td>lat</td>
</tr>
<tr>
<td>elle – ele</td>
<td>78.5%</td>
<td>dur</td>
</tr>
</tbody>
</table>
Sensitivity to laterality

Korean listeners had trouble discriminating elle-ele.

Korean listeners discriminated difference in laterality alone (ele-ere) AS WELL AS difference in both laterality and duration (elle-ere).
Koreans seem to weight laterality cues more heavily than durational cues in /l/-/r contrast.

Can this be explained by a general L2 perception strategy?
L2 listeners are not necessarily more sensitive to spectral differences than to durational differences:

Bohn (1995): “duration cues in vowel perception are easy to access whether or not listeners have had specific linguistic experience with them.” (but see e.g. Escudero 2005)
If tendency to hear English [VIV] as Korean [VIIIV] does not reflect a general L2 perceptual strategy,

Where does it come from?
NL Perceptual Strategy (Kim 2007)

Subjects: Korean monolingual or near-monolingual listeners

Stimuli: real and nonce words such as

[muri] ‘group’
[mulli] ‘physics’
[muli] (nonword, illegal)

Forced choice for (e.g.) [muli]:
Did you hear muri or mulli?
Results (Kim 2007)

[VIV] identified as

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VIV</td>
<td>324</td>
<td>90%</td>
</tr>
<tr>
<td>VrV</td>
<td>36</td>
<td>10%</td>
</tr>
</tbody>
</table>
Kim’s results suggest that in mapping from an acoustic signal to phonological representation in their native language, Korean listeners attend more closely to laterality than to duration.
Korean perception grammar

For intervocalic liquids:

\[ \text{highF3} = [\text{II}] \gg \text{short} = [\text{r}] \]

To interpret VIV as VIIV, listeners weight laterality over duration.
IL/NL perception grammar

<table>
<thead>
<tr>
<th>‘cola’ (high F3, short)</th>
<th>[highF3]=ll</th>
<th>short=r</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kʰora</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>&gt; c. kʰolla</td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘chorus’ (lowF3, short)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; a. kʰorasixmap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. kʰollasixmap</td>
<td></td>
<td>*!</td>
</tr>
</tbody>
</table>
Interpretation of cues is specific

- to position:
  - ‘lobby’ > [robi]
  - ‘robe’ > [robɨ]

- To segment type: cf. cases where duration is only cue:
  - [kannan] ‘newborn’
  - [kanan] ‘poverty’
Malayalee English and Korean loanword adaptation: assumption of accurate perception leads to unlearnable production grammars.

Transfer of NL perception grammar leads to inaccurate perception.
Part 2: Competing Views of Lexical Representations

1. Radical Underspecification: Lexical representations must not contain redundant/predictable features (e.g. Kiparsky 1985, Archangeli 1988).

2. Lexical representations are unconstrained (e.g. Prince & Smolensky 1993).

2. Acoustic Cues (Boersma 2007, etc.): Perception grammar may utilize all available cues (both contrastive and predictable), though rankings may induce greater attention to particular cues.
Argument for perception filtered through minimally specified features

Brown 2001:

Japanese listeners have more difficulty perceiving English r/l contrast than listeners whose NL has a feature that specifies a similar contrast.
Korean Minimal Specification?

The most efficient specification for the Korean phoneme inventory:

<table>
<thead>
<tr>
<th>Contrast</th>
<th>Specified</th>
<th>Predictable</th>
</tr>
</thead>
<tbody>
<tr>
<td>[nn] – [n]</td>
<td>duration</td>
<td></td>
</tr>
<tr>
<td>[ll] – [r]</td>
<td>duration</td>
<td>(laterality)</td>
</tr>
</tbody>
</table>
But…

Evidence from identification and discrimination experiments indicates that Korean speakers attend to laterality more than to duration.

Therefore, we cannot assume that Korean uses the smallest possible number of specified features (duration for [nn] - [n] and [ll] - [r]).
Durational insensitivity: Additional evidence

ERP evidence (Broselow, Hwang, & Squires 2009) that Korean speakers do not attend to durational cues in liquids even at automatic, pre-attentive levels of processing.

ERP: measure of event-related electrical activity on scalp.
Electrode Cap
Mismatch Negativity (MMN) indicates an automatic, pre-attentive neural response to a change in auditory stimulus.

MMN is elicited even in the absence of attention to stimulus (e.g., while watching a silent movie).
MMN to durational changes in Korean

Behavioral studies suggested duration is not major cue to \([r] - [ll]\) contrast.

Prediction: durational difference in liquids should elicit weaker MMN than durational difference in nasals (where it is the primary cue).
Stimuli

1. elle vs. ele
2. enne vs. ene

[elle] and [enne] stimuli created by shortening the long consonants in [elle],[enne].

[elle] = [enne] 98ms.
[ele] = [ene] 48ms.

(Same acoustic difference)
Task: Oddball Paradigm

Subjects (10 Korean NSs in US) heard through headphones (while watching a silent movie):

elle – elle – elle – elle – ele – elle – elle …

(standard = elle, deviant = ele)

or

enne - enne - enne- enne- enne- ene – enne - enne…

(standard-enne, deviant=ene)
Predictions

If **duration** is the primary cue for both contrasts, then:

*same* MMN for [elle-elle] as [enne-ene].

If **laterality** is the primary cue for [ll]-[r], then:

*weaker* MMN for [elle-elle] than [enne-ene].
2400 trials (8 blocks of 300).

Onset of deviance: 88ms. after beginning of stimulus.

(MMN is typically elicited 150-250 msec after onset of deviance.)
Korean listeners

English listeners

Lateral pair

Nasal pair

Standard

Deviant
Difference Waveform

Electrode: FZ

- Korean nasal
- Korean lateral
- English nasal
- English lateral
Interim Summary

Identification
Discrimination
ERP

All reveal insensitivity to durational in liquids (at different levels of processing), consistent with misinterpretation of English VIV as VIIV.
Asymmetrical sensitivity to duration in nasals vs. liquids supports segment-specific sensitivity.

This sort of sensitivity is compatible with a perception grammar consisting of ranked constraints that are position-specific and segment-specific, but is problematic for a view of perception in terms of radically underspecified features.
ERP evidence for underspecification in perception?

Eulitz & Lahiri (2004): Mental representations contain minimally specified features, and NL perception reflects this.
Eulitz & Lahiri assumptions

In oddball paradigm, repeated **standard** activates (minimally specified) lexical representation.

Acoustic structure of **deviant** is compared with this abstract lexical representation.

Conflict arises only when deviant does not match SPECIFIED feature of standard.
Hypothetical Example (Eulitz & Lahiri experiment involved German vowels)

Assume coronal place is unspecified.

\[
\begin{array}{ccc}
p & t & k \\
[\text{labial}] & & [\text{dorsal}]
\end{array}
\]

(See e.g. Fikkert & Levelt 2004, Kager et al. 2007, van der Feest, Kager, Kerkhoff, Zamuner on children’s perception and Curtin et al. 1998, Pater 2003 on 2LA.)
Stronger MMN to (a) than (b):

(a) **Standard (pa):** specified [labial].

    **Deviant (ta):** coronal place cues.

⇒ **Conflict between standard and deviant.**

(b) **Standard (ta):** no specified place.

    **Deviant (pa):** labial place cues. **BUT**

⇒ **NO conflict between (unspecified) standard and deviant.**
What sort of asymmetries would we predict for Korean case?
Radical Underspecification

<table>
<thead>
<tr>
<th>segment</th>
<th>nn</th>
<th>n</th>
<th>ll</th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>specified</td>
<td>long</td>
<td></td>
<td>long</td>
<td>(lateral)</td>
</tr>
<tr>
<td>(redundant)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prediction: same asymmetry for nasal and liquids

Stronger MMN

standard enne, elle – deviant ene, ele: Conflict

Weaker MMN

standard enne, ele - deviant enne, elle: No Conflict
Restricted underspecification

<table>
<thead>
<tr>
<th>segment</th>
<th>nn</th>
<th>n</th>
<th>ll</th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>specified</td>
<td>long</td>
<td>lateral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(redundant)</td>
<td>(long)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prediction: asymmetry only for nasals

Stronger MMN
- **standard enne** – **deviant enne**: Conflict

Weaker MMN
- **standard enne** - **deviant enne**: No Conflict

No conflict for **elle-ele** vs. **ele-elle**
Results: interaction of category (nasal vs. liquid) and direction (increment vs. decrement)

**English subjects:**
- liquids: no significant directional effect
- nasals: no significant directional effect

**Korean subjects:**
- liquids: no significant directional effect
- nasals: only significant interaction of category and direction
  
  (stronger MMN to enne-ene than ene-enne)
Grand average-Korean group

Decremental change

Incremental change

Nasal

Grand average

Korean group

standard

deviant

Lateral
Grand average-English group

Decremental change

Incremental change

Nasal

Lateral

- standard
- deviant
Results

The only significant category-direction interaction was in the Korean perception of nasal contrast:

Stronger MMN to enne-enee than to ene-enee,

This is consistent with ‘Less Radical Underspecification’ assumption that length is specified for [nn] but not [ll].
BUT

In OT, there is nothing to prevent [ll] from being specified as BOTH lateral and long.

If that is the case, wouldn’t we expect a directional effect for both nasals and liquids?
Directional asymmetries

Question 1: Why did Koreans show a MMN asymmetry correlating with direction (long-short vs. short-long) in nasals but not liquids?

Question 2: Why did Koreans show a stronger MMN to decremental changes?
   stronger response to enne (standard) - ene (deviant)
   weaker response to ene (standard) – enne (deviant)
Possible Answer 1: Restricted Underspecification

Length is specified for [nn] but not for [ll].

Standard [ll] (unspecified), deviant [l]: No conflict
Standard [l] (unspecified), deviant [ll]: No conflict

Standard [nn] (long), deviant [n]: Conflict
Standard [n] (unspecified), deviant [nn]: No conflict
Possible Answer 2: Cue sensitivity

Question 1: Why did Koreans show directional sensitivity for nasals but not liquids?

Answer: Duration is the primary cue for the nasal contrast, but not for the liquid contrast (as reflected in ranking [lateral]=[l] >> [short]=[r]). Korean listeners lack sensitivity to durational cues in liquids, hence weak response to both directions.
Question 2: Why did Koreans show a stronger response to 

[nn] (standard) – [n] (deviant) than to 

[n] (standard) – [nn] (deviant)?

Answer: Greater sensitivity to change from long to short is found even for nonspeech sounds.
Asymmetrical responses to duration not limited to speech

Takegata et al. 2008

Stronger MMN response to long standard – short deviant in:

- Vowels
- Chords
- Sine waves

(though not white noise)
“Technically, decrement and increment MMNs can reflect different neuronal activities…”

“The onset of deviance is a sound offset for the decrement MMN, as opposed to a sound continuation for the increment MMN. Sound offset clearly conveys to the brain the occurrence of a new event, whereas no objective event triggering a new neural activity exists to sound continuation…”

Takegata et al. 2008
Conclusion

Asymmetry in MMN to enne-ene vs. ene-enne can be attributed to general properties of the acoustic events rather than underspecification.

Lack of asymmetry in MMN to elle-ele vs. ele-elle can be attributed to general lack of attention to duration in liquids by Korean listeners.
Lack of attention to duration in liquids stems from its relative lack of importance as a cue to the [ɪl]-[r] contrast (reflected in rankings of the perception grammar).

Cf. Kuhl 2004: Early exposure to a language produces a “neural commitment” to the acoustic cues that are important for that language.
1. NL repair ≠ FL repair arises from inaccurate perception due to transfer of NL perception grammar,  
   NOT from different rankings in production grammar.

2. Perception of FL determined by weighting of acoustic cues in NL perception,  
   NOT from filtering through minimally specified lexical representations.
All the patterns we found were consistent with classical OT assumptions concerning:

1. Learnability: No need for rankings of production and perceptions grammars that cannot be learned from ambient data.

2. Lexical representations: No need for minimally specified representations.
Dank u wel!

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