The Phonological Aspect of Phonetic Change

Josef Fruehwald
University of Pennsylvania
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NWAV 40
Outline

Introduction

What is Phonetic Change?
   The Unit of Phonetic Change
   The Process of Phonetic Change
   The Role of Phonology
Proposal

Application of the Proposal
   The Unity Principle
   /eyC/ in Philadelphia

Conclusion
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Conclusion
What is the unit of phonetic change?

- I’ll be assuming, following Labov (1981) that “sound change” is not monolithic.
- I’ll be focusing on neogrammarian sound change, rather than other kinds of sound change.
- “Phonemes Change”
What is the unit of phonetic change?

/æ/
What is the unit of phonetic change?

/æe/

− hi
+ low
− back
− peripheral
What is the unit of phonetic change?

/æ/
What is changing in a phonetic change?

− hi → large F1
+ low → larger F1
− back → large F2
− peripheral → close to center
What is changing in a phonetic change?

- hi → large F1
- low → larger F1
- back → large F2
- peripheral → close to center
What is changing in a phonetic change?

- hi → large F1
- low → larger F1
- back → large F2
- peripheral → close to center
What is changing in a phonetic change?

You’re not going to get anywhere messing with the phonological representation.
What is changing in a phonetic change?

- hi → large F1
- low → larger F1
- back → large F2
- peripheral → close to center
Is it worth talking about phonology?

/æ/
Is it worth talking about phonology?

/æ/
Is it worth talking about phonology?

\[ / \varepsilon / \]

[−back
[−peripheral]
Is it worth talking about phonology?

/ɪ/ \ae/  

\[ -\text{back} \quad \rightarrow \quad -\text{peripheral} \quad \rightarrow \quad \text{less large F2} \quad \rightarrow \quad \text{close to center} \]

Boberg (2005)
Durian (2009)
Durian & Joseph (approx 15 minutes ago)
Is it worth talking about phonology?

Is there a robust relationship between phonetic variation and change and phonological representation?

Correlation Analysis

- Utilized the Philadelphia Neighborhood Corpus.
  - 272 speakers.
  - 654,820 vowel measurements.
  - 7730 vowel means
- For each pairwise comparison of vowels, I calculated the correlation of those vowel means across speakers
Is it worth talking about phonology?

<table>
<thead>
<tr>
<th>Speaker</th>
<th>Æ</th>
<th>É</th>
</tr>
</thead>
<tbody>
<tr>
<td>JStevens</td>
<td>0.65</td>
<td>0.37</td>
</tr>
<tr>
<td>NJulian</td>
<td>0.97</td>
<td>0.44</td>
</tr>
<tr>
<td>GSalvi</td>
<td>0.89</td>
<td>0.39</td>
</tr>
<tr>
<td>BDAddario</td>
<td>1.03</td>
<td>0.39</td>
</tr>
</tbody>
</table>

→

<table>
<thead>
<tr>
<th>Vowel 1</th>
<th>Vowel 2</th>
<th>cor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Æ</td>
<td>É</td>
<td>0.45</td>
</tr>
<tr>
<td>Æ</td>
<td>a</td>
<td>0.18</td>
</tr>
</tbody>
</table>

...
Is it worth talking about phonology?

<table>
<thead>
<tr>
<th>F1</th>
<th>Vowel 1</th>
<th>Vowel 2</th>
<th>cor</th>
<th>Same Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>æ</td>
<td>ε</td>
<td>0.45</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>æ</td>
<td>a</td>
<td>0.18</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>...</td>
</tr>
</tbody>
</table>
What is Phonetic Change?

Application of the Proposal

Conclusion
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What is Phonetic Change?

Application of the Proposal

Conclusion

**Probability of Phonological Match**

- 0.0
- 0.2
- 0.4
- 0.6
- 0.8
- 1.0

-1.0 -0.5 0.0 0.5 1.0

Sex

- f
- m

**Pearson's r**

**Sex**

- f
- m

---

**F2**

**Probability of Phonological Match**

**Pearson's r**
Introduction

What is Phonetic Change?

It is worth talking about phonology

Patterns in both parallel shifts and in phonetic variation across speakers appears to be relatable to phonological natural classes.

Conclusion
Phonology-Phonetic Interface

Phonology

Language Specific Implementation

Phonetic Alignment

uw → [+back]/l

[+back] → small F2

Kingston & Diehl, 1994; Boersma & Hamann, 2008

tūn

Cohn, 1993; Zsiga, 2000
Proposal

- At least at their outset, phonetic change is a change in the implementation of surface phonological representations.
- The units of phonetic change are the same as the units the Phonology-Phonetics interface can see.
  - Natural class (i.e. parallel shifts) = features
  - Single vowel shift = holistic surface representation
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Unity Principle

- Diachronic Phonological Unity → Diachronic Phonetic Unity
Unity Principle

- Diachronic Phonological Unity $\rightarrow$ Diachronic Phonetic Unity
- Diachronic Phonetic Disunity $\rightarrow$ Diachronic Phonological Disunity
/eyC/ in Philadelphia

Background

Description

• The raising and peripheralization of /ey/ in non-word final position
  • *snake* sound similar to *sneak*.
• Identified as a new and vigorous change in Philadelphia (Labov, 2001).

PNC
This is the second most vigorous change in the corpus following the raising of /ay0/.
/eyC/ in Philadelphia

Contexts

DOB
Diag
−2
−1
0
1
2
1900 1920 1940 1960 1980

Context
final
/l/
hiatus
closed

Context

final
/l/
hiatus
closed
/eyC/ in Philadelphia

Phonological analysis

Unity Principle

- Pre-C ≠ Final
- Pre-C ≠ Pre-Hiatus
- Pre-C ≠ Pre-/l/
/eyC/ in Philadelphia

Phonological analysis

Unity Principle

• Pre-C ≠ Final
• Pre-C ≠ Pre-Hiatus
• Pre-C ≠ Pre-/l/

Phonological Analysis

• ey → +peripheral / ___C/#
/eyC/ in Philadelphia
Change Analysis

The Change

- ey$_{+periph}$ becomes more phonetically peripheral.
- ey$_{-periph}$ remains stable.

Future Extension
If one of the non-participating environments were to become participating in the future, it would necessarily be a phonological change.
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Conclusion

• Phonetic change and phonetic variation can be related to phonological natural class behavior.
• It provides an explanatory account for parallel shifts.
• This also allows for a clear way to leverage diachronic phonetic data to phonological investigation.
Thanks

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References


