Cyclic Degrading: Strict Cyclicitiy Meets Variable Rules

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University of Pennsylvania  Carnegie Mellon University

NWA V43 — 30 October 2014
Previous Work: Exponential Model

- Morphologically sensitivity for variable rules following intuition of Guy (1991a,b)
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- Deeper embedded = higher rate of application
 Previously on Morphologically Sensitive Variable Rules

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- Using stem/word/phrase, Exponential Model
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$$XY \rightarrow Z$$
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- Using stem/word/phrase, Exponential Model

\[ XY \rightarrow Z \]

\[
[[ [XY]_s ]_\omega ] \phi \quad \text{Stem}
\]
\[
[[[X]_s Y]_\omega ] \phi \quad \text{Word}
\]
\[
[[[X]_s ]_\omega Y ] \phi \quad \text{Phrase}
\]

- 3x
- 2x
- 1x
Previous Work: Guy 1991

Guy’s Model: TD deletion in English

<table>
<thead>
<tr>
<th></th>
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<tr>
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<td>38.1%</td>
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(Ignoring semiweak, for which, see Fruehwald 2012; Tamminga and Fruehwald 2013)
Overview: New Data shows opposite trend

- Two cases: Korean /w/-deletion and AAVE /t/-assibilation
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- Two cases: Korean /w/-deletion and AAVE /t/-assibilation
- Environment at stem level = less deletion, environment only at word level = more deletion.

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\[
XY \rightarrow Z
\]

\[
\left[ [XY]_s \right]_\phi \quad \left[ [X]_s Y \right]_\phi
\]

- Stem: \(\checkmark\)
- Word: \(\checkmark\) & \(\checkmark\)

Exponential Predictions
- Higher
- Lower
Overview: New Data shows opposite trend

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- Environment at stem level = less deletion, environment only at word level = more deletion.

\[ XY \rightarrow Z \]

\[
\begin{align*}
[[XY]_s \omega]_\phi & \quad [ [X]_s Y \omega ]_\phi \\
\checkmark & \\
\checkmark & \\
\checkmark & \\
\end{align*}
\]

Stem

Exponential Predictions

Korean & AAVE

Higher

Lower

Higher

Shwayder, Kwon & McLaughlin

Cyclic Degrading

N WAV43

30 Oct 2014
Outline

- More detail on each case study
- Parallel to standard phonology phenomenon
- Discussion of implementation in grammar
Korean /w/-deletion (Kwon 2014)

- Seoul Korean: /w/ variably deleted in CwV
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Two Morphological conditions:

- (A) CwV sequence part of stem
eexample: swip- "easy"
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- Feeding Phonology: /o/ → /w/ / _ V

Two Morphological conditions:

- (A) CwV sequence part of stem
  example: swip- "easy"
- (B) CwV sequence created by word level affix
  example: s’o- "shoot, fire" + -ayo "informal polite"
  → s’wayo
Korean /w/-deletion: Expected Results

Class A
swipta "to be easy"

Class B
s’wayo "shoot, fire (inf.pol.)"

\[
\begin{align*}
\text{Stem:} & \quad [ [s\text{wip}]_s +\text{ta}]_\omega & \quad \text{✓} \\
\text{Word:} & \quad [ [s\text{wip}]_s +\text{ta}]_\omega & \quad \text{✓} \\
\text{Phrase:} & \quad \text{higher w-deletion} & \quad \text{lower w-deletion}
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Korean /w/-deletion: Expected Results

Class A
swipta "to be easy"
[[ [swip]_s +ta ]_ω ]_φ

Class B
s’wayo "shoot, fire (inf.pol.)"
[ [[s’o]_s+ayo]_ω ]_φ → [ [s’wayo]_ω ]_φ

- Stem
  ✓

- Word
  ✓  ✓

- Phrase
  ✓  ✓
  higher w-deletion  lower w-deletion

- Deletion A>B
### Results

#### Average Deletion Rate

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Three age groups behaved differently with respect to /w/-deletion rates (and some other factors). In each age group, each person had the same directionality of pattern. The 40+ age group showed the expected exponential model. The 15-20 age group showed equal rates, which Kwon posits change to a process that is not morphologically sensitive (i.e., phrasal only). The puzzle arises in the 21-40 year old group, where the pattern shows a reversal.
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- Puzzle: 21-40 year old group shows reversal of pattern.
Retreat of a rule

- Kwon suggests a retreat of the /w/-deletion rule

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- Youngest and Oldest groups work; interpolate middle group

However, we expect the 21-40 group to have equal /w/-deletion in Class A and B (because CwV sequence is equally available at word level in both classes).

21-40 still a Puzzle!
AAVE /t/-assibilation

- Variably /t/ → [s] / _ s

Data from Frank Porter Graham Corpus

*Thanks to the FPG institute, NCState, and Walt Wolfram for use of the FPG corpus
AAVE /t/-assibilation

- Variably /t/ → [s] / _ s
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AAVE /t/-assibilation

Schematically

Expected Assibilation Rate

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Stem

- Expected: higher

Word

- Expected: lower

Expect: monomorphemic > polymorphemic
AAVE /t/-assibilation

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Actual Rate /t/-assibilation

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<td>(verbal)</td>
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low n, q’s about auxiliary *gets*
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low $n$, q’s about auxiliary *gets*

Note on monomorphemic [ts]s:

- Tokens in corpus are "united states" (agrees as singular)
- AAVE speaker intuitions on other common /ts/ words "pizza" and "blitz" are good as [ts] and bad as [s]
  (minimal pairs with "piece o’" and "bliss")
AAVE /t/-assibilation

Expect: monomorphemic > polymorphemic

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low n, q’s about auxiliary *gets*

- /t/-assibilation not even active the stem level?
- Still seems to affect application of /t/-assibilation at word level (blocks completely!)
Summary of Data and Generalization

- **Cyclic Degrading**: The rate of application of variable rules is lower in deeper embedded environments

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- Expected Exponential
- Korean /w/-deletion (21-40)
- AAVE /t/-assibilation

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Shwayder, Kwon & McLaughlin

Penn

Cyclic Degrading

N-WAV43

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14 / 25
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- Expected Exponential: >
- Korean /w/-deletion (21-40): <
- AAVE /t/-assibilation: <

- What is the mechanism?
- Why does this deviate from Exponential Model?
Observation: Non-Derived Environment Blocking

- Standard phonology literature: **Strict Cycle Effect (SCE)** (Kean 1974; Mascaró 1976; Kiparsky 1982) or **Non-derived Environment Blocking (NDEB)** (Kiparsky 1993; Burzio 2009)
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Classic Example: (Kiparsky 1993)

- Finnish /t/-assibilation: /t/ → [s] / _ i
- Feeding Phonology: /e/-raising: /e/ → [i] / _ #
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Essive Sg. Nom. Sg.

"water" √VETE vete-nä vesi
"mother" √ÄITI äitti-nä äitti
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- Same environment as our data

\[ XY \rightarrow Z \]
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[[ [XY]_s ]_\omega ]_\phi \quad [ [[X]_s Y]_\omega ]_\phi
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- Stem: \checkmark
- Word: NDEB: \checkmark

- In NDEB case, at word level environment XY has not changed
Proposal: Cyclic Degrading is SCE/NDEB

- **Cyclic Degrading**: The rate of application of variable rules is lower in SCE/NDEB environments.
Proposal: Cyclic Degrading is SCE/NDEB

- **Cyclic Degrading**: The rate of application of variable rules is lower in SCE/NDEB environments

- Question: Blocked completely or only degraded rate?

  Korean /w/-deletion rate
  
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Not impossible to apply deletion in blocking environment (unlike classic SCE/NDEB)

Ideally, same blocking mechanism as SCE/NDEB (still somewhat mysterious)

Shwayder, Kwon & McLaughlin
Proposal: Cyclic Degrading is SCE/NDEB

- **Cyclic Degrading**: The rate of application of variable rules is lower in SCE/NDEB environments

- **Question**: Blocked completely or only degraded rate?

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Implementations in Grammar

How is Cyclic Degrading implemented in the grammar?

1. Full Blocking (Classic SCE/NDEB)
2. Variable “Activity”
3. Competing Grammars
Full Blocking

- SCE/NDEB are about the phonology not having access to “inactive” material (see Embick 2013)
Implementations in Grammar

**Full Blocking**

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Full Blocking (complete inactivity):

\[ XY \rightarrow Z \]
Full Blocking

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Full Blocking (complete inactivity):

\[ XY \rightarrow Z \]
\[ [ [XY]_s ]_\omega \]
\[ [ [X]_s Y ]_\omega \]

Stem

Word

Surface Rate:

Stem Rate

Word Rate
Full Blocking

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Full Blocking (complete inactivity):

\[ XY \rightarrow Z \]
\[ [ [XY]_s ]_\omega \]
\[ [ [X]_s Y ]_\omega \]

Stem

<table>
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<th>Z</th>
<th>XY</th>
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<td></td>
<td></td>
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</table>

Word

- BLOCK

<table>
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<tr>
<th>Z</th>
<th>XY</th>
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<td></td>
<td></td>
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Surface Rate:

- Surface rates = rate at word (alone) and stem (alone).
- Prediction: No process can ever apply at both stem and word in same derivation
Full Blocking

- To the extent we do see Exponential Model patterns, this seems odd
Full Blocking

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Korean /w/-deletion rate

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Shwayder, Kwon & McLaughlin
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**Full Block:**

- $s, \omega, \phi$
- $\omega, \phi$

---

Shwayder, Kwon & McLaughlin

Cyclic Degrading

NWAV43 30 Oct 2014 20/25
Variable “Activity”

- Possibility: What makes phonology “active” or “accessible” is different for variable rules.
- Activity of a variable rule at one level makes environment for that rule “active” for the next level.
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Act.: $s \rightarrow \omega, \phi = 3 \quad \omega, \phi = 2$

Suggestion: Some sort of neural/psychological activation (see, e.g., Tamminga 2014)
**Variable “Activity”**

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**Korean /w/-deletion rate**

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<td>2</td>
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<td>1</td>
<td>2</td>
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Why? How?

Suggestion: Some sort of neural/psychological activation (see, e.g., Tamminga 2014)
Variable “Activity”

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Act.: \( s \not\rightarrow \omega, \phi \) =1 \( \omega, \phi \) =2

- Why? How?
- Suggestion: Some sort of neural/psychological activation (see, e.g., Tamminga 2014)
Competing Grammar Approach

- Grammar which violates SCE/NDEB is chosen less often
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Grammar Competition: \[ XY \rightarrow Z \]
Competing Grammar Approach

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Grammar Competition: \( XY \rightarrow Z \)

- Stem: \( Z \) \( XY \)
- Word: \( !\text{NDEB!} \)

Rate: Between Stem and Stem+Word

Word Rate
### Predictions

<table>
<thead>
<tr>
<th>Stem Level/ Monomorphemic</th>
<th>Word Level/ Polymorphemic</th>
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<tr>
<td>$[[XY]<em>s \omega]</em>\phi$</td>
<td>$[[X]<em>s Y \omega]</em>\phi$</td>
</tr>
<tr>
<td><strong>Exponential</strong></td>
<td>&gt;</td>
</tr>
<tr>
<td>$s,\omega,\phi$</td>
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</tr>
<tr>
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<td>?</td>
</tr>
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<td>$\omega,\phi$</td>
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Conclusions

- Two case studies which show opposite trend of Exponential Model
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- Implementations? Full Blocking, Variable “Activity”, Competing Grammars
Thank you!
References


