The history of English intrusive liquids: using the present to ascertain the past

Ricardo Bermúdez-Otero

University of Newcastle upon Tyne

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DIACHRONIC REDUCTIONISM, OPTIMALITY THEORY, AND LIQUID INTRUSION

Diachronic reductionism vs OT

§1 Diachronic reductionism

Explanations for phonological patterns may reside in synchronic analysis or diachronic evolution [...], but since historical accounts permit simpler grammatical models they are preferable wherever possible.

Blevins & Garrett (2004: 118)

Functionalist proponents: e.g. Bybee (2001), Blevins (2004)
Formalist proponents: e.g. Hale & Reiss (2000), Hyman (2001)

§2 The argument against OT

Marked structures are those which, for phonetic reasons, are more likely to become distorted in production or perception and, consequently, to be lost through change.

☞ Ockham’s Razor: markedness constraints are superfluous.


Liquid intrusion: synchronically arbitrary?

§3 The rise of intrusive r: the rule inversion account

See e.g. Vennemann (1972), McMahon (2000a: ch. 6).

(a) Original rhotic system: /V#/ ≠ /V{#}/

<table>
<thead>
<tr>
<th>e.g.</th>
<th>saw</th>
<th>saw up</th>
<th>soar</th>
<th>soar up</th>
</tr>
</thead>
<tbody>
<tr>
<td>/sɔː/</td>
<td>/sɔː ʌp/</td>
<td>/sɔːə/</td>
<td>/sɔːə ʌp/</td>
<td></td>
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(b) Linking r: /V#/ ≠ /V{#}/

V → [–high] / ___ ˌ 1 (by breaking and laxing before r)

1 → ə / ___ {C, ˌ} (r-loss)

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<td></td>
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§4 The case for arbitrariness

• r-insertion violates the Emergence of the Unmarked: [ɾ] is highly marked.

• No synchronic connection between intrusive r and the preceding nonhigh vowel: the distribution of intrusive r reflects that of linking r prior to rule inversion.


§5 Alleged implications

• Phonological processes created by analogical change, rather than through the phonologization of a phonetic effect, can freely violate markedness laws.

• Markedness constraints cannot be cognitively real.

§6 The counterargument

The rule inversion account is incompatible with two pieces of synchronic evidence:

• the phonetic evidence on the position of intrusive liquids in syllable structure,
• dialects where linking l and intrusive l have different distributions.

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**INTRUSIVE LIQUIDS AND SYLLABLE STRUCTURE**

The phonetic evidence

§7 Linking liquids and intrusive liquids are phonetically identical (e.g. Gick 1999: 31-2).

§8 /l/ in Gick (2003)

• Subject: MR, male, Southern California, mid 20s

• Method: EMMA (electromagnetic midsagittal articulometer)

• Targets: V#IV e.g. see Lynn (my examples)
  VI#V e.g. seal in
  VI#C e.g. seal him

• Results:
  (a) Magnitude of the dorsal gesture: no difference
  (b) Timing of the coronal and dorsal gestures: V#IV coronal lead (‘light l’)
  VI#V coronal lag (‘dark l’)
  VI#C
  (c) Magnitude of the coronal gesture: V#IV > VI#V > VI#C

- Subjects: 8 speakers of “(near-) standard English” (5 English, 1 Scottish, 2 American)
- Method: electropalatographic records in MOCHA database
- Targets: $l\#C_{[labial]}$
- $l\#V$
- Results: 7 out of 8 subjects show the following alternation categorically
  - $l\#C \Rightarrow$ no linguoalveolar contact (= ‘vocalized $l$’)
  - $l\#V \Rightarrow$ linguoalveolar contact (= ‘consonantal $l$’)

§10 A three-way phonetic contrast between $V\#IV$, $VI\#V$, and $VI\#C$

Most clearly manifest in American English accents with the following pattern:

<table>
<thead>
<tr>
<th>Position</th>
<th>Example</th>
<th>Linguoalveolar contact?</th>
<th>Coronal lead?</th>
<th>Percept</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V#IV$</td>
<td><em>see Lynn</em></td>
<td>YES</td>
<td>YES</td>
<td>clear, consonantal</td>
</tr>
<tr>
<td>$VI#V$</td>
<td><em>seal in</em></td>
<td>YES</td>
<td>NO</td>
<td>dark, consonantal</td>
</tr>
<tr>
<td>$VI#C$</td>
<td><em>seal him</em></td>
<td>NO</td>
<td>NO</td>
<td>dark, vocalic</td>
</tr>
</tbody>
</table>

§11 Similar evidence for /l/

- In nonrhotic accents, word-final prevocalic [l], whether linking or intrusive, is more ‘vocalic’ (has greater energy at all frequencies) than word-initial [l] (McCarthy 1993: 179).
- Magnitude of coronal gesture in rhotic accents (Gick 1999: 47-9):
  - $V\#.lV > V.l\#V > V.l\#C$

This refutes Jensen (2000: 220), who postulates a two-way distinction ($V.l\#V = V.l\#C$).

Syllabification

§12 How do we account for the unique properties of word-final prevocalic liquids?

§13 Analysis I: parallel ambisyllabification (e.g. McCarthy 1993)

/sɔːl̩p/  
saw[ə]p

- Intrusive $r$ inserted in the coda to satisfy FINALC (‘A prosodic word must end with a consonant’).
- Intrusive $r$ adjoined to following onset to satisfy ONSET.
- Adjunction to the following onset allows satisfaction of CODA[CODA[ə]] (‘[ə] must be licensed by an onset’).
§14 Analysis II: cyclic resyllabification (e.g. Kiparsky 1979, McCarthy 1991)

/soː ʌp/
saw[ʌ]p

Word level

- CODA\[\text{\textipa{\textipa{}}}\] \(\sigma\) \(\sigma\) \(\sigma\) \(\sigma\)
- In the coda, \textipa{\textipa{}} acquires the feature \[\text{\textipa{lax}}\], to be realized as reduction (and delay) of the C-gesture.

Phrase level

- CODA\[\text{\textipa{\textipa{}}}\] ranked high, \textipa{\textipa{}} \(\sigma\)
- Intrusive \textipa{\textipa{}} resyllabifies to satisfy \textipa{\textipa{}} \(\sigma\), thereby also fulfilling CODA\[\text{\textipa{\textipa{}}}\], but remains lax.

§15 Predictions of the ambisyllabic analysis

On the evidence of /\textipa{\textipa{}}/-flapping, classic ambisyllabic analyses (Kahn 1976, Gussenhoven 1986) postulate ambisyllabicity in two environments:

(a) word-final prevocalic

\quad \text{e.g.} \quad \text{\textipa{\textipa{}}}\textipa{\textipa{}}

\quad [\text{\textipa{i}:\textipa{z}]}

\quad \downarrow \quad \text{[\textipa{r}]}

\quad ‘Onset Capture’

(b) foot-medial intervocalic

\quad \text{e.g.} \quad \text{\textipa{\textipa{}}}\textipa{\textipa{}}

\quad [\text{i\textipa{\textipa{}}}\textipa{\textipa{}}]

\quad \downarrow \quad \text{[\textipa{r}]}

\quad ‘Coda Capture’

Prediction: liquids will have the same allophonic realization in word-final prevocalic position (e.g. \textipa{\textipa{}}\textipa{\textipa{}}) and foot-medial intervocalic position (e.g. \textipa{\textipa{}}\textipa{\textipa{}})

§16 A counterexample to the ambisyllabic analysis (data from Sproat & Fujimura 1993)

- Subjects: 4 speakers (2 male, 2 female), Midwestern American, early 20s
- Method: X-ray microbeam cinematography
- Targets: nonce words \textipa{\textipa{}} (morpheme-internal foot-medial) \textipa{\textipa{}} (word-final prevocalic)
- Results: \textipa{\textipa{}} ⇔ coronal lead (‘light \textipa{\textipa{}}’) \textipa{\textipa{}} ⇔ coronal lag (‘dark \textipa{\textipa{}}’)
- Conclusion: In this accent, ambisyllabic analyses cannot deal with the allophony of plosives and liquids simultaneously.
§17 Summary of synchronic results

- Intrusive liquids have both onset-like and coda-like properties.
- This is the result of a cyclic resyllabification effect:
  (a) Intrusive r is inserted in ω-final position after nonhigh vowels at the word level to satisfy FINALC. Being in the coda, it picks up the feature [lax].
  (b) At the phrase level, ω-final lax r resyllabifies into the onset before vowel-initial words; otherwise, it deletes under pressure from CODA[COND]C.

Diachronic implications

§18 There is evidence that
- r-intrusion after /ə/ precedes r-intrusion after /a, ð/.
- word-final r-intrusion precedes stem-final r-intrusion

See
- early orthoepic treatises (e.g. Sheridan 1762, Elphinston 1787)
- relative frequencies in conservative RP (Jones 1928, Gimson 1989: 303-4)

§19 The rise of intrusive r after word-final /ə/
- Initial stage: linking r
  (a) Anna [ænə]  (b) Peter [piːtə]
  Anna is [ænəɪz]  Peter is [piːtəɪz]

Because of final schwa loss in Middle English, pattern (a) had very low type-frequency (mainly loanwords) ⇒ Learners tend to reanalyse /ə/-final citation forms as predictably following pattern (b). See Harris (1994: 253).
- But the linking r is lax, contrasting with nonlax word-initial r:
  (b) Peter is [piːtəɪz]  (c) to reserve [tərɪzv]

Therefore, if UG does not allow ambisyllabicity as an option, learners must interpret linking r as a word-level coda resyllabified into the onset.
- Therefore,

\[
\begin{array}{c}
\text{Word level} \\
\text{Phrase level}
\end{array}
\begin{array}{c}
\text{pɪtə} \\
pɪtəɪz \\
ænə
\end{array}
\begin{array}{c}
\text{ænəɪz} \\
\text{ænə}
\end{array}
\]

⇒ Rise of a word-level phonotactic constraint against [ə]-final ω, satisfied by r-insertion (hence the automatic character of intrusive r; cf. McMahon 2000a).

§20 Comparison with the rule inversion story

- Rule inversion story: underlying /piːtə/ > underlying /piːtə/
- Actual development: word-level [ænə] > word-level [ænəɪ]

The rule inversion account depends on an imperfect understanding of the syllabic behaviour of intrusive r:

either it ignores syllable structure altogether (Vennemann 1972, McMahon 2000a)
or it erroneously assumes ambisyllabicity (McCarthy 1993).
§21 But the fact remains that liquids are highly marked, and therefore not expected as epenthetic segments, whether at the word level or the phrase level!

*The classic response:*

Liquid intrusion is licensed by the sharing of V-place features with the preceding vowel.


§22 *The clinching piece of synchronic evidence*


Certain English dialects spoken in the Northeast of the United States exhibit the following distribution (Gick 1999, 2002b):

- **Linking l after all vowels**
  
  e.g. /ɔː/ drawl [dɔːl] drawling [dɔːlɪŋ]
  
  /ɔ/ cruel [kʌːrəl] cruel act [kʌːrəl ækt]
  
  /ɑː/ Dahl [dɑːl] Dahl is [dɑːl ɪz]
  
  etc.

- **Intrusive l after /ɔː/ only**
  
  e.g. /ɔː/ the law[l] is...
  
  but /ɔ/ the idea[ɔ] is...
  
  /ɑː/ the brd[ɔ] is...

This is totally unexpected under the rule inversion analysis: cf. §4.

§23 *Synchronic constraints*

In these dialects, /l/ is pronounced with the same V-gesture as /ɔː/ (Gick et al. 2002)

l-intrusion is tolerated when the epenthetic l gets its V-gesture by spreading from the preceding vowel:  

\[
\begin{array}{c}
\text{C-place} \\
\text{V-place} \\
[\text{dorsal}] \\
\end{array}
\quad \begin{array}{c}
\text{C-place} \\
\text{V-place} \\
[\text{dorsal}] \\
\end{array}
\quad \begin{array}{c}
\text{C-place} \\
\text{V-place} \\
[\text{coronal}] \\
\end{array}
\quad \begin{array}{c}
\text{C-place} \\
\text{V-place} \\
[\text{coronal}] \\
\end{array}
\]

\[
\begin{array}{c}
\varnothing \\
\end{array}
\quad \begin{array}{c}
\varnothing \\
\end{array}
\quad \begin{array}{c}
\varnothing \\
\end{array}
\quad \begin{array}{c}
\varnothing \\
\end{array}
\]

\[
\begin{array}{c}
\circ \\
\end{array}
\quad \begin{array}{c}
\circ \\
\end{array}
\quad \begin{array}{c}
\circ \\
\end{array}
\quad \begin{array}{c}
\circ \\
\end{array}
\]

\[
\begin{array}{c}
\text{[lateral]} \\
\text{[coronal]} \\
\end{array}
\quad \begin{array}{c}
\text{[lateral]} \\
\text{[coronal]} \\
\end{array}
\quad \begin{array}{c}
\text{[lateral]} \\
\text{[coronal]} \\
\end{array}
\quad \begin{array}{c}
\text{[lateral]} \\
\text{[coronal]} \\
\end{array}
\]
CONCLUSION

§24  • The rule inversion account on the rise of intrusive liquids in English is untenable.
      • The evidence of liquid intrusion fails to support the reductionist critique of OT: liquid intrusion is not synchronically arbitrary.
      • To reconstruct the history of a linguistic phenomenon, the first thing we need is an adequate synchronic analysis.

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**CONTACT DETAILS**

Ricardo Bermúdez-Otero  
School of English Literature, Language, and Linguistics  
University of Newcastle upon Tyne  
Newcastle upon Tyne NE1 7RU  
United Kingdom

R.Bermudez-Otero@ncl.ac.uk  
www.bermudez-otero.com