

Resolving the paradox of Irish preverbal d' in a modular grammatical system

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Initial consonant mutation in Irish

- (1) a. *ní dhúnfaidh siad é*
NEG L.close.FUT they it
'They will not close it.' [d→ɣ]
- b. *an gcreideann tú í?*
Q E.believe.PRS you her
'Do you believe her?' [k→g]
- c. *d' fhágfainn*
HIST L.leave.COND.1SG
'I would leave.' [f→∅]

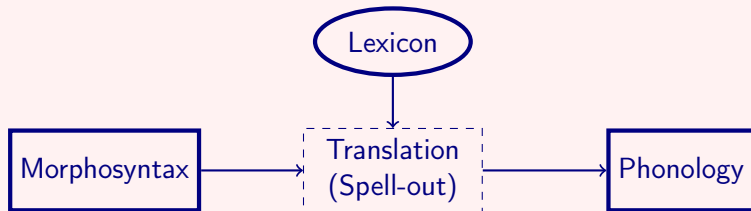
L = "Lenition" (*séimhiú*); E = "Eclipsis" (*urú*)

Initial consonant mutation (ICM)

Systematic **phonological alternation** of word-initial consonants,
depending on **morphosyntactic context**

Modularity in linguistics

- **Modularity:** human language faculty is formed from a set of autonomous specialised subsystems (Fodor 1983; Scheer 2010)
 - Semantics, morphology, syntax, phonology, phonetics, ...
- **Strictest interpretation:** morphosyntax is blind to phonology and phonology is blind to morphosyntax



Autosegmental account of ICM

- Floating phonological material on the right edge of a trigger word

- (2)
- | | | |
|----|--|-----------|
| a. | <i>ní</i> -{L} <i>dúnfaidh</i> → <i>ní dhúnfaidh</i> | /d/ → [ɣ] |
| b. | <i>an</i> -{E} <i>creideann</i> → <i>an gcreideann</i> | /k/ → [g] |
| c. | <i>d'</i> -{L} <i>fágfainn</i> → <i>d' fhágfainn</i> | /f/ → [∅] |

- Prediction:** conditions for insertion of trigger word cannot be sensitive to the post-mutation identity of the target
- Demonstrably fails to hold for preverbal tense particle *d'*

My claim

- Preverbal *d'* is an **underlyingly floating** segment
- Distribution follows from its **interaction with the ICM system**

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Irish ICM: Phonological alternations

Unmutated		Lenition		Eclipsis	
p ^(j)	⟨p⟩	f ^(j)	⟨ph⟩	b ^(j)	⟨bp⟩
t ^(j)	⟨t⟩	h ^(j)	⟨th⟩	d ^(j)	⟨dt⟩
k ^(j)	⟨c⟩	x ^(j)	⟨ch⟩	g ^(j)	⟨gc⟩
b ^(j)	⟨b⟩	v ^(j)	⟨bh⟩	m ^(j)	⟨mb⟩
d ^(j)	⟨d⟩	ɣ ^(j)	⟨dh⟩	n ^(j)	⟨nd⟩
g ^(j)	⟨g⟩	ɣ ^(j)	⟨gh⟩	ŋ ^(j)	⟨ng⟩
m ^(j)	⟨m⟩	v ^(j)	⟨mh⟩	—	—
f ^(j)	⟨f⟩	∅ ^(j)	⟨fh⟩	v ^(j)	⟨bhf⟩
s ^(j)	⟨s⟩	h ^(j)	⟨sh⟩	—	—
l ^(j)	⟨l⟩	(l ^(j))	(⟨l⟩)	—	—
n ^(j)	⟨n⟩	(n ^(j))	(⟨n⟩)	—	—

(adapted from Iosad 2023)

- **Lenition:** Stops → fricatives; coronals lose/change place feature
- **Eclipsis:** Voiceless stops → voiced; voiced stops → nasal

Mutation following so-called “trigger words”:

- Prepositions:
 - **Lenition:** *de* ‘from/of’, *do* ‘for/to’, *ó* ‘from’, *trí* ‘through’, ...
 - **Eclipsis:** *i* ‘in’
- Preverbal particles:
 - **Lenition:** *a* (relative prt), *má* (cond), *ní* (neg), *d’* (tense prt), ...
 - **Eclipsis:** *go* (comp), *an* (question), *dá* (cond), *nach* (neg comp), ...

Mutation linked to morphosyntactic features on the target word:

- Adjectival agreement:
 - *bean* **b**heag **dh**ílis ‘a **L**.small **L**.loyal woman’
- Definite possessors:
 - *bád* (*mór*) **Sh**eáin ‘**L**.Seán’s (big) boat’

ICM in an autosegmental framework

- Morphology is fundamentally concatenative
- Phonologically defective morphemes
(e.g. Trommer 2011; Bye & Svenonius 2012; Zimmermann 2022)

Floating phonological material + Target consonant → Mutated target

e.g. floating features (Lieber 1983)

floating elements (Breit 2019)

floating geometric structure (Iosad 2014)

Advantages:

- Compatible with strict modularity (Scheer 2010; Bermúdez-Otero 2012)
- No ad hoc diacritics (cf. Hamp 1951; Pyatt 1997)
- Captures phonological regularities (cf. Stewart 2004; Green 2006)

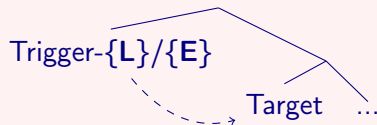
ICM in an autosegmental framework

Possible sources of mutation-inducing material

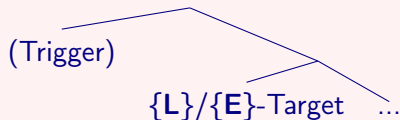
(Laoide-Kemp 2023)

- **Type 1:** Mutation material at right edge of a trigger word
- **Type 2:** Mutation material as a prefix on the target word

Type 1:



Type 2:



- **Both sources** are necessary to account for the Irish ICM data

The puzzle of the historic tense particle

- “Historic” tenses: past indicative/habitual/subjunctive; conditional
- Markers of historic tense: (“independent” clauses)
 - Preverbal “historic tense particle” *d’*
 - “Historic tense lenition” on the verb

(3) *d’* *fhág* *mé*
 HIST L.leave I
 ‘I left’

Hypothesis: Preverbal *d’* is a mutation trigger word

- (4) Historic tense marker:
 [+HIST] \longleftrightarrow *d* {L}

The puzzle of the historic tense particle

- (4) Historic tense marker:
 $[+HIST] \longleftrightarrow d \{L\}$

However, d' only appears in a **subset** of phonological environments

\implies Phonologically conditioned allomorphy?

- (5) Historic tense marker (revised):
- $$[+HIST] \longleftrightarrow \begin{cases} d \{L\} & \text{in Phonological Environment A} \\ \emptyset \{L\} & \text{in Phonological Environment B} \end{cases}$$

Q: What is “Phonological Environment A”?

The puzzle of the historic tense particle

(6) a. *d'* ól mé ← empty consonantal slot

HIST drink I

'I drank.'

b. *d'* fhág mé ← empty consonantal slot

HIST L.leave I

'I left.'

(Gussmann 1986; Ní Chiosáin 1991)

c. (**d'*) bhog mé

(HIST) L.move I

'I moved.'

- Recall: f “deletes” under lenition: $f^{(j)} \rightarrow \emptyset^{(j)}$ (orthographic $\langle fh \rangle$)

Context for insertion of historic tense particle *d'* (Phon. Env. A)

An empty consonantal slot in the **post-mutation** form of the target word

The puzzle of the historic tense particle

Context for insertion of historic tense particle *d'* (Phon. Env. A)

An empty consonantal slot in the **post-mutation** form of the target word

⇒ **Spell-out timing paradox!**

- Historic tense marker inserted **before** mutation?
 - cannot be sensitive to post-mutation form of the target

d-{L} *ól* *∅*-{L} *fág* *∅*-{L} *bog*

- Historic tense marker inserted **after** mutation?
 - cannot be the origin of mutation-inducing material

d-{L} *ól* *d*-{L} *fhág* *∅*-{L} *bhog*

A morphosyntactic solution: {L} separate from *d'*

Two distinct exponents of historic tense:

- Historic tense prefix {L}- triggers lenition
- Historic tense particle *d'* inserted separately

d' {L}-*fágfainn*

Recall: **independent evidence** for mutation-inducing prefixes in Irish

- (7)
- bád (mór) Sheáin* 'L.Sean's (big) boat'
 - ár (dhá) gcapall* 'our (two) E.horse(s)'

Q: Is there any evidence that the *d'* and {L}- are separate entities?

A morphosyntactic solution: {L} separate from *d'*

- Past tense impersonal forms in Irish resist mutation:

- (8) a. *bhogfaí* '(someone) would L.move' (COND.IMPERS)
b. *bogadh* '(someone) moved' (PST.IMPERS)
- (9) a. *má bhogaim* 'if I L.move' (PRES)
b. *má bogadh* 'if (someone) moved' (PST.IMPERS)

- **Prediction:** *d'* should only appear before vowel-initial verbs

- **Observation:** *d'* never appears

- (10) a. *(*d') bogadh* '(someone) moved' (PST.IMPERS)
b. *(*d') óladh* '(someone) drank' (PST.IMPERS)
c. *(*d') fágadh* '(someone) left' (PST.IMPERS)

- Further problem: evidence from **Munster dialects** (see Appendix A)

Recall: The puzzle of the historic tense particle

- (6) a. *d'* ól mé ← empty consonantal slot
HIST drink I
'I drank.'
- b. *d'* fhág mé ← empty consonantal slot
HIST L.leave I
'I left.'
- c. (**d'*) bhog mé
(HIST) L.move I
'I moved.'

(Gussmann 1986; Ní Chiosáin 1991)

- **Previously:** *d'* is only inserted in a subset of phonological contexts
- **Instead:** What if *d'* is **always inserted**, but only pronounced under specific phonological conditions?

A phonological solution

- Mutation-inducing material {L} inserted alongside d'
- A **separate factor** prevents d' from surfacing in some contexts

(d)-{L} *fágfainn*

My proposal

- Preverbal d' is a phonologically deficient “floating d' ”
 - Only pronounced if linked to an **empty consonantal slot**
-
- Similar to liaison in French: *peti[ʔ] chat* vs. *peti[t] enfant*

A phonological solution

Working within a strict CV framework...

(Lowenstamm 1996; Scheer 2012)

Proposed historic tense morpheme: $[+hist] \leftrightarrow \begin{array}{c} | \\ d \quad \{L\} \end{array}$

My claim

Observed distribution of d' is derived **entirely within the phonology**

Assumptions:

- $\{L\}$ docks onto the consonant **immediately to its right** (if present)
- Floating (d) only pronounced if linked to an **adjacent C-slot** that is both **segmentally empty** and **licensed**
- Phon. processes apply **whenever their conditions are met**

(Kaye 1992)

A phonological solution

Historic tense morpheme:

[+hist] \leftrightarrow $\begin{array}{c} | \\ d \end{array} \{L\}$

Before C-initial verb: *bog* 'move'

$\begin{array}{cccc} & C_1 & V_1 & C_2 & V_2 \\ & | & | & | & \\ d \{L\} & \cdots \rightarrow & b & o & g \end{array}$

\Rightarrow Result: *bhog*

Before V-initial verb: *ól* 'drink'

$\begin{array}{cccc} & C_1 & V_1 & C_2 & V_2 \\ & | & | & | & \\ d \{L\} & \nearrow & \cancel{\cdots} & ó & l \end{array}$

\Rightarrow Result: *d'ól*

A phonological solution

Historic tense morpheme:

[+hist] \leftrightarrow $\begin{array}{c} | \\ d \end{array} \{L\}$

Before *f*-initial verb: *fág* 'leave'

	C ₁	V ₁	C ₂	V ₂
	/			
<i>d</i> {L}	$\cdots \rightarrow$	<i>f</i>	<i>á</i>	<i>g</i>

\Rightarrow Result: *d' fhág*

- Lenition-inducing material {L} deletes initial *f*
- Empty C-slot becomes available for floating (*d*) to link to

\Rightarrow Derives observed distribution of preverbal *d'*

A phonological solution

- Resolves the “spell-out timing paradox”
- Consistent with autosegmental approach to phonology
- Irish already has a rich system of prevocalic consonantal prefixes
 - **t-prefixation** after M.SG definite article
an t-éan ‘the bird’
 - **n-prefixation** in many eclipsis environments
ár n-athair ‘our father’
 - **h-prefixation** after a range of particles/prepositions
go hÉireann ‘to Ireland’ (Cyran 1995; Morrison 2020)
- Only difference here is the interaction with the mutation system

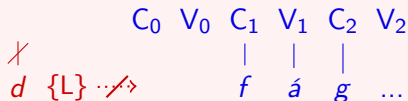
Phonological solution: Past tense impersonal forms

- **Recall:** Past tense impersonal forms resist mutation **and** *d*-prefixation

- (11)
- | | | |
|----|---------------------------------|-------------------------------|
| a. | <i>bogadh</i> '(someone) moved' | (* <i>bh</i> ogadh) |
| b. | <i>óladh</i> '(someone) drank' | (* <i>d'</i> óladh) |
| c. | <i>fágadh</i> '(someone) left' | (* <i>d'</i> <i>fh</i> ágadh) |

- **Solution:** these forms carry additional structure at their left edge

(e.g. Breit 2019; Scheer 2012)



⇒ Result: *fágadh*

Key takeaways

- Irish preverbal *d'* is **underlyingly floating**
- Distributional pattern derived **entirely within the phonology**
- Consistent with **modular grammatical architecture**:
 - Morphosyntax \implies insertion of floating material
 - Phonology \implies application of regular phonological processes
- Commitment to strict modularity allowed us to compare two **minimally different solutions**

Go raibh míle maith agaibh!

Thank you!

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Appendix A: Evidence from Munster Irish

- So far: based on standard variety of Irish (Christian Brothers 1960)
- Same pattern robustly observed in dialects of Connaught (de Bhaldraithe 1945; Ó Curnáin 2007) and Ulster (Hughes 1986)
- Munster Irish: more widespread use of preverbal *d' / dh'* (Ó Sé 2000)

Standard	Munster*	Gloss
<i>ní fhásann</i>	<i>ní dh' fhásann</i>	'(it) doesn't grow'
<i>má fhanann</i>	<i>má dh' fhanann</i>	'if (he) stays'
<i>d' imigh</i>	<i>(do) dh' imigh</i>	'(he) went away'

*Note: <dh> = [ɣ] in Munster Irish

- However, **phonological restrictions on *dh'* are the same**

Appendix A: Evidence from Munster Irish

- **Morphosyntactic account:**

- {L} originates at right edge of triggering particles (*ní*, *má*, etc.)
 - But preverbal *dh'* sits **between** trigger and mutated consonant
- ⇒ Forced to conclude *dh'* and {L} are inserted together – a contradiction

- **Phonological account:**

- Floating (ɣ) found in **all** lenition-triggering environments
- Reanalysed as part of the basic lenition pattern in the clause

	Standard	Munster
Preverbal particles	<i>ní</i> -{L} <i>má</i> -{L} ...	<i>ní</i> -(ɣ){L} <i>má</i> -(ɣ){L} ...
Historic tense marker	(<i>d</i>){L}	<i>do</i> -(ɣ){L} / (ɣ){L}

Appendix B: *fr-* and *fl-* clusters

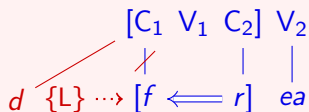
- (12) a. *d'* *fhliuch sí* [...] (13) a. *(*d')* *léim sé*
HIST L.wet she (HIST) jump he
'She wet [...].'
b. *d'* *fhreagair sí* b. *(*d')* *rith sé*
HIST L.answer she (HIST) run he
'She answered.'

- In both cases, surface form of verb is *l-/r*-initial
- However,
 - in (12), empty C-slot remains following deletion of word-initial *f*
 - in (13) there is no such empty slot

Appendix B: *fr*- and *fl*- clusters

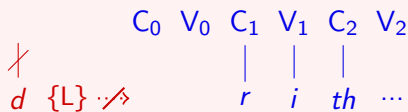
- Assume infrasegmental government relationship (IG; \Leftarrow) between consonants in a cluster (Scheer 1998)

Initial *fr*- cluster: *freagair*



\Rightarrow Result: *d' fhreagair*

Initial *r*- (PST.IMP): *ritheadh*



\Rightarrow Result: *ritheadh*

- Q:** How does **lenited *fr*- cluster** differ from **empty CV** before *r*?
 - A:** IG structure is retained following deletion of initial *f*-