

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

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Initial consonant mutation in Irish

- (1) a. *ni dhúnfaidh siad é*
NEG L.close.FUT they it
'They will not close it.' [d→γ]
- 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→∅]

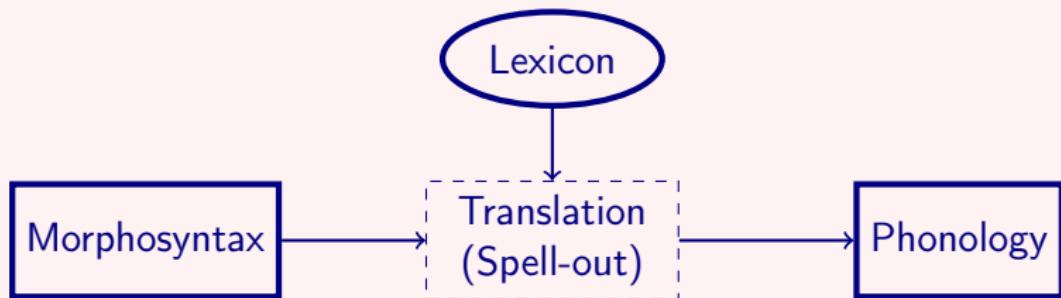
L = "Lenition" (*séimhiú*); E = "Eclipsis" (*urú*)

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-{L} dúnfaidh</i> → <i>ní dhúnfайдh</i>	/d/ → [ɣ]
	b.	<i>an-{E} creideann</i> → <i>an gcreideann</i>	/k/ → [g]
	c.	<i>d'-{L} 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 losad 2023)

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

Irish ICM: Mutation contexts

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 bheag dhílis* ‘a L.small L.loyal woman’
- Definite possessors:
 - *bád (mó�) Sheáin* ‘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:
 - 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

⇒ 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; Ni Chiosáin 1991)
- c. *(*d') bhog mé*
(HIST) L.move I
'I moved.'

- Recall: f "deletes" under lenition: $f^{(j)} \rightarrow \emptyset^{(j)}$ (orthographic ⟨fh⟩)

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* \emptyset -{L} *fág* \emptyset -{L} *bog*

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

d-{L} *ól* *d*-{L} *fhág* \emptyset -{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) a. *bád (mór) Sheáin* 'L.Sean's (big) boat'
 b. *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.	<i>bhogfaí</i> '(someone) would L.move'	(COND.IMPERS)
	b.	<i>bogadh</i> '(someone) moved'	(PST.IMPERS)
(9)	a.	<i>má bhogaim</i> 'if I L.move'	(PRES)
	b.	<i>má bogadh</i> 'if (someone) moved'	(PST.IMPERS)

- Prediction: *d'* should only appear before vowel-initial verbs
- Observation: *d'* never appears

(10)	a.	(* <i>d'</i>) <i>bogadh</i> '(someone) moved'	(PST.IMPERS)
	b.	(* <i>d'</i>) <i>óladh</i> '(someone) drank'	(PST.IMPERS)
	c.	(* <i>d'</i>) <i>fágadh</i> '(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[t] chat* vs. *peti[t] enfant*

A phonological solution

Working within a strict CV framework...

(Lowenstamm 1996; Scheer 2012)

Proposed historic tense morpheme: $[+hist] \leftrightarrow d \{L\}$

My claim

Observed distribution of d' is derived entirely within the phonology

Assumptions:

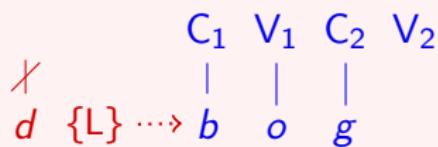
- $\{L\}$ docks onto the consonant **immediately to its right** (if present)
- Floating (d) only pronounced if linked to an **adjacent C-slot** that is both **segmentally empty** and **licensed**
- Phon. processes apply **whenever their conditions are met** (Kaye 1992)

A phonological solution

Historic tense morpheme:

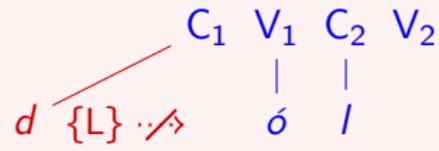
$$[+hist] \leftrightarrow | \\ d \quad \{L\}$$

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



⇒ Result: *bh**og*

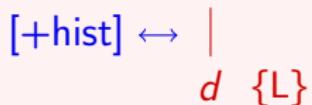
Before V-initial verb: *ól* 'drink'



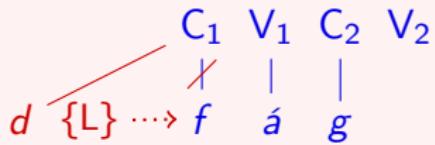
⇒ Result: *d'* *ól*

A phonological solution

Historic tense morpheme:



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



⇒ Result: *d' fhág*

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

⇒ 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’
- Only difference here is the interaction with the mutation system

(Cyran 1995; Morrison 2020)

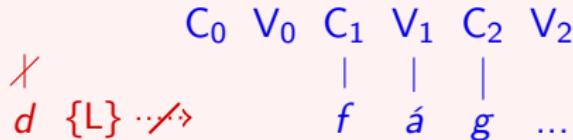
Phonological solution: Past tense impersonal forms

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

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

- 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 (γ) 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> -(γ){L} <i>má</i> -(γ){L}
Historic tense marker
	(<i>d</i>){L}	<i>do</i> -(γ){L} / (γ){L}

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

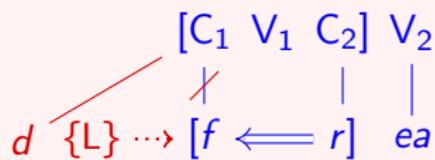
(12)	a.	<i>d'</i> <i>fhlíuch sí</i> [...]	(13)	a.	<i>(*d')</i> <i>léim sé</i>
		HIST L.wet she			(HIST) jump he
		'She wet [...].'			'He jumped.'
	b.	<i>d'</i> <i>fhreagair sí</i>		b.	<i>(*d')</i> <i>rith sé</i>
		HIST L.answer she			(HIST) run he
		'She answered.'			'He ran.'

- 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

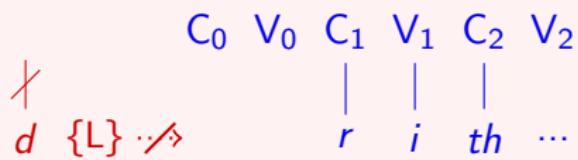
- Assume infrasegmental government relationship (IG; \Longleftarrow) between consonants in a cluster (Scheer 1998)

Initial *fr-* cluster: *freagair*



\Rightarrow Result: **d' f**reagair

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



\Rightarrow Result: **r**itheadh

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