Myopic effects in the Irish initial consonant mutation system

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Initial consonant mutation (ICM)

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

(1) a. ***b**róg* /broːg/
         'shoe'
     b. *an **bh**róg* /vroːg/
         'the **L**.shoe'   (**L** = "Lenition")
     c. *ár **mb**róg* /mroːg/
         'our **E**.shoe'   (**E** = "Eclipsis")
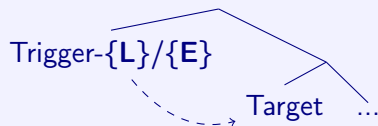
- Autosegmental framework   (e.g. Lieber 1983; Iosad 2014; Breit 2019)

Introduction

Two sources of initial consonant mutation (Laoide-Kemp 2023)
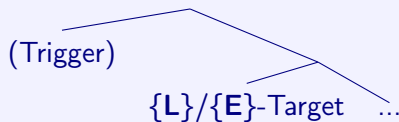
- **Type 1:** Mutation material at right edge of a trigger word
- **Type 2:** Mutation material as a prefix on the target word

Type 1:

Trigger-{**L**}/{**E**}   Target   ...

an-{**L**} bróg ⟶ *an **bh**róg*

Type 2:

(Trigger)

{**L**}/{**E**}-Target   ...

ár {**E**}-bróg ⟶ *ár **mb**róg*

Introduction

Myopia: if structure is built up **incrementally**, processes can only be sensitive to material that is **already present** in the derivation

My claim

Myopic effects at the morphosyntax-phonology interface lead to subtle yet observable differences between these two mutation types.

Example 1: the puzzle of "historic tense particle" *d'*
- Mutation outcome affects spell-out of preceding word $\Rightarrow$ **Type 2**

Example 2: coronal blocking of mutation
- Phonology of preceding word interferes with mutation $\Rightarrow$ **Type 1**

Table of Contents

Autosegmental model of mutation

- Morphology is fundamentally concatenative
- Phonologically defective morphemes

  (e.g. Trommer 2011; Bye & Svenonius 2012; Zimmermann 2017)

Floating phonological material + Target consonant $\longrightarrow$ 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)

Two sources of mutation-inducing material

Q: Where does this mutation-inducing material come from?
A: Right edge of "trigger word"?

- Prepositions:
    - **Lenition:** *de* 'from/of', *do* 'for/to', *ó* 'from', *trí* 'through', ...
    - **Eclipsis:** *i* 'in'
    - **Non-mutation:** *ag* 'at', *as* 'out of', *go* 'to', *le* 'with', ...

- Numerals:
    - **Lenition:** 1-6 (e.g. *trí **bh**ád* 'three **L**.boats')
    - **Eclipsis:** 7-10 (e.g. *naoi **mb**liana* 'nine **E**.years')

- Preverbal particles:
    - **Lenition:** *a* (relative prt), *má* (cond), *ní* (neg), *d'* (historic prt), ...
    - **Eclipsis:** *go* (comp), *an* (question), *dá* (cond), *nach* (neg comp), ...

Two sources of mutation-inducing material

Q: Where does this mutation-inducing material come from?
A: Right edge of "trigger word"?

(2) a. *i **mb**aile*
         in **E**.town
         'in a town'   (noun)

     b. *i **ng**ach áit*
         in **E**.every place
         'in every place'   (adjective)

(3) a. *an teach a **ch**eannóimid*
         the house REL.DIR **L**.buy.FUT.1PL
         'the house that we will buy'   (verb)

     b. *hata a **dh**' oirfeadh dom*
         hat REL.DIR **L**.HIST suit.COND to.me
         'a hat that suited me'   (tense particle)

Two sources of mutation-inducing material

Objections:

- Linear non-adjacency:
  - *ár*[trigger] *dhá **gc**apall* 'our two **E**.horses'

- No overt trigger:
  - ***dh**úisigh mé* 'I **L**.awoke'

- Mutation linked to morphosyntactic features on target:
  - *muintir **Sh**eáin* '**L**.Seán's family'

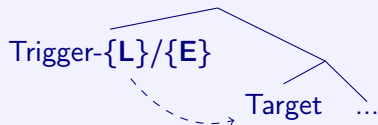⇒ Not necessarily homogeneous   (Duffield 1995; Iosad 2014; Laoide-Kemp 2023)

Two sources of mutation-inducing material
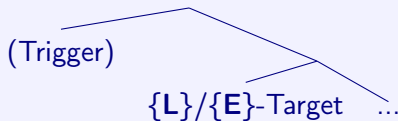
Two sources of initial consonant mutation

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

Type 1:

Trigger-{**L**}/{**E**}

Target ...

Type 2:

(Trigger)

{**L**}/{**E**}-Target ...

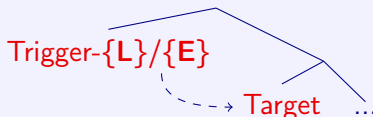*an*-{**L**} bróg ⟶ *an* ***bh****róg*   *ár* {**E**}-bróg ⟶ *ár* ***mb****róg*

Spell-out assumptions

- Spell-out is **incremental**
- Proceeds from **inside out**, starting with most embedded node
- Spelt out material undergoes **immediate phonological processing**

Type 1: *an*-{**L**} *bróg* $\longrightarrow$ *an* **bh** róg

Trigger-{**L**}/{**E**}

Target …

Spell out...

bróg
an-{**L**} *bróg*
an **bh**róg $\longleftarrow$ mutation

Spell-out assumptions

- Spell-out is **incremental**
- Proceeds from **inside out**, starting with most embedded node
- Spelt out material undergoes **immediate phonological processing**

Type 2: *ár* {**E**}-*bróg* ⟶ *ár* **mb**ró*g*

(Trigger)

{**L**}/{**E**}-Target ...
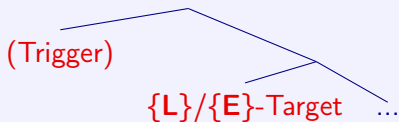
Spell out...

bróg
{**E**}-*bróg*
mb*róg* ⟵ mutation
ár **mb**ró*g*

Myopic effects in the Irish ICM system

Type 1:   *bróg*
        an-{**L**} *bróg*
          *an **bhr**óg*   ⟵— mutation **after** trigger is spelt out

Type 2:   *bróg*
        {**E**}*-bróg*
          ***mbr**óg*   ⟵— mutation **before** "trigger" is spelt out
        *ár **mbr**óg*

My claim

Myopic effects at the morphosyntax-phonology interface lead to subtle yet observable differences between these two mutation types.

Example 1: the puzzle of historic tense particle *d'*

(4)   a.   *ní **dh**íolfaidh siad* 'they did not **L**.sell'   *ní*-**{L}**
          b.   *an **gc**reideann tú?* 'do you **E**.believe?'   *an*-**{E}**
          c.   *d' **fh**ágfainn* 'they would **L**.leave'   *d'*-**{L}**

- **Hypothesis:** Pre-verbal particles are instances of Type 1 mutation

- **Prediction:** trigger word cannot be sensitive to the post-mutation identity of the target **(no look-ahead)**

- Demonstrably fails to hold for "historic tense particle" *d'*

- **Conclusion:** must be a case of **Type 2** mutation

Example 1: the puzzle of historic tense particle *d'*

Two classes of tense/mood combinations:

- **Historic**: past indicative, past habitual, conditional, past subjunctive
- **Non-historic**: everything else

Markers of historic tense:

- Pre-verbal particles
    - Historic tense particle *d'*
    - *-r* forms: *ní* vs. *níor*; *an* vs. *ar*
- "Historic tense lenition"

Example 1: the puzzle of historic tense particle *d'*

- Appears only before words that are underlyingly vowel- or *f*-initial

(5) a. **d'** *ól* *mé* ⟵ empty consonantal slot
         HIST drink I
         'I drank.'

    b. **d'** **fh***reagair mé* ⟵ empty consonantal slot
         HIST **L**.answer I
         'I answered.'

         (Gussmann 1986; Ní Chiosáin 1991)

    c. **(*d')** **bh***uaigh mé*
         (HIST) **L**.win I
         'I won.'

Phonological context for insertion of historic tense particle *d'*

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

Example 1: the puzzle of historic tense particle *d'*

Phonological context for insertion of historic tense particle *d'*
An **empty consonantal slot** in the **post-mutation** form of the target word

i.e. mutation occurs **before** *d'* is spelt out

$\implies$ Mutation is of **Type 2**

Proposal: two distinct exponents of historic tense
- Historic tense prefix {**L**}- triggers lenition
- Historic tense particle *d'* inserted separately

Note: a similar effect is found in historic tense copular clauses

Myopic effects in the Irish ICM system

Type 1:
          bróg
      an-{**L**} *bróg*
        *an **bh**róg* ⟵ mutation **after** trigger is spelt out

Type 2:
          bróg
      {**E**}-*bróg*
       ***mb**róg* ⟵ mutation **before** "trigger" is spelt out
      *ár **mb**róg*

We have seen...

- Mutation outcome affects spell-out of preceding word ⇒ **Type 2**

Up next...

- Phonology of preceding word interferes with mutation ⇒ **Type 1**

Example 2: coronal blocking of mutation

- Lenition is regular after the feminine definite article *an*

(6) *an* **bh***róg*
     the.F **L**.shoe(F)
     'the shoe'

(7) a. *a***n** **t***eanga*
         the.F language(F)
         'the language'

     b. *an **th***eanga*
         the.F **L**.language(F)
         'the language'

Coronal blocking (CB)

Blocking of mutation when two coronals come together at a word boundary

Example 2: coronal blocking of mutation

More examples:

- *ar a**n** **t**alamh* 'on the ground'
- *ao**n** **d**ath* 'one colour'
- *an chéa**d** **s**raith* 'the first series'
- *leas-**d**eartháir* 'half-brother'
- *mio**n**-**s**onraí* 'minor details'
- *fa**d**-**t**éarmach* 'long-term'

However...

- *bá**d** **Sh**eáin* '**L**.Seán's boat'   (**bá**d **S**eáin*)
- *bea**n** **dh**ílis* 'a **L**.loyal woman'   (**bea**n **d**ílis*)
- *na heitleái**n** **dh**earga* 'the **L**.red aeroplanes'   (**na heitleái**n **d**earga*)

Example 2: coronal blocking of mutation

Sketch analysis: (Ní Chiosáin 1991)

- "Coronal fusion": adjacent coronals must share their [+coronal] feature

- Target no longer available as host for floating phonological material

    ⇒ Mutation is blocked

Recall:

- **Type 1**: mutation occurs **after** trigger is spelt out
- **Type 2**: mutation occurs **before** "trigger" is spelt out

    ⇒ Only **Type 1** can be affected by phonology of preceding word

Example 2: coronal blocking of mutation

Coronal blocking examples: Trigger word:

- *a**n** **t**eanga* 'the language'   *an*-{**L**}
- *ar a**n** **t**alamh* 'on the ground'   *an*-{**E**}
- *ao**n** **d**ath* 'one colour'   *aon*-{**L**}
- *an chéa**d** **s**raith* 'the first series'   *chéad*-{**L**}
- *lea**s**-**d**eartháir* 'half-brother'   *leas*-{**L**}
- *mio**n**-**s**onraí* 'minor details'   *mion*-{**L**}
- *fa**d**-**t**éarmach* 'long-term'   *fad*-{**L**}

$\Rightarrow$ All instances of **Type 1** mutation

Example 2: coronal blocking of mutation

No coronal blocking:

- *bá**d Sh**eáin* 'L.Seán's boat'   ⟵ definite possessor
- *bea**n dh**ílis* 'a L.loyal woman'   ⟵ adjectival agreement
- *na heitleái**n dh**earga* 'the L.red aeroplanes' ⟵ adjectival agreement

(8)   a.   *bád mór **Sh**eáin* 'L.Seán's big boat'
   b.   *bád **Sh**eáin **Mh**ór* 'L.Big L.Seán's boat'

(9)   a.   *bean **bh**eag **dh**ílis* 'a L.small L.loyal woman'
       b.   *na heitleáin **dh**earga **ch**éanna* 'the L.same L.red aeroplanes'

⇒ All instances of **Type 2** mutation

Example 2: coronal blocking of mutation

Illustrative example: *an **t**raein*(FEM) ***dh**earg* 'the **L**.red train'

- Lenition after feminine definite article *an* $\longrightarrow$ **Type 1**
- Lenition on adjectives modifying a feminine noun $\longrightarrow$ **Type 2**
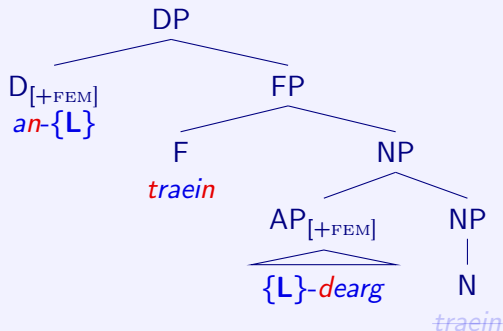
(Duffield 1995; Borsley et al 2007)

Conclusions

My claim

Myopic effects at the morphosyntax-phonology interface lead to subtle yet observable differences between two distinct mutation types.

Example 1: historic tense lenition

- Mutation outcome affects spell-out of preceding word ⇒ **Type 2**

Example 2: coronal blocking of mutation

- Phonology of preceding word interferes with mutation ⇒ **Type 1**

Go raibh míle maith agaibh! – Thank you!

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Appendix A: Phonology of mutations

Phonological alternations:

Radical	p	t	k	b	d	g	f	s	m	n	l	r
Lenited	f	h	x	v	ɣ	ɣ	∅	h	v	–	–	–
Eclipsed	b	d	g	m	n	ŋ	v	–	–	–	–	–

Note: each consonant above also has a "palatalised" counterpart
$\longrightarrow$ same mutation pattern, but with secondary [+pal] feature

Appendix B: Evidence for the empty consonantal slot

Evidence for empty consonantal slot in vowel-initial words:

(10) a. *ithir* /ihir^j/ 'soil'
      b. *an ithir* /ən^j ihir/ 'the soil' (Ní Chiosáin 1991:80)

(11) a. *aois* /iːs^j/ 'age'
      b. *an aois* /ən iːs/ 'the age' (Ní Chiosáin 1991:81)

Evidence for empty consonantal slot following lenition of *f*:

(12) a. *feoil* /fʲoːlʲ/ 'meat'
      b. *an **fh**eoil* /ən^j oːlʲ/ 'the meat' (Gussmann 1986:894)

(13) a. *fáinne* /fanʲə/ 'ring'
   b. *an **fh**áinne* /ən anʲə/ 'the ring' (Gussmann 1986:894)

- Inserted to satisfy onset requirement?
  - No – see (14)

- Inserted if syllabification does not violate phonotactic constraints?
  - No – see (15)

(14)   a.   ***d'***   ***fh****liuch sí* [...]
            HIST **L**.wet she
            'She wet [...].'

       b. ***d'***   ***fh****reagair sí*
            HIST **L**.answer she
            'She answered.'

(15)   a. *(***d'**)* *léim sé*
            (HIST) jump he
            'He jumped.'

       b. *(***d'**)* *rith sé*
            (HIST) run he
            'He ran.'

Structure of the Irish finite verb clause: (McCloskey 2017)
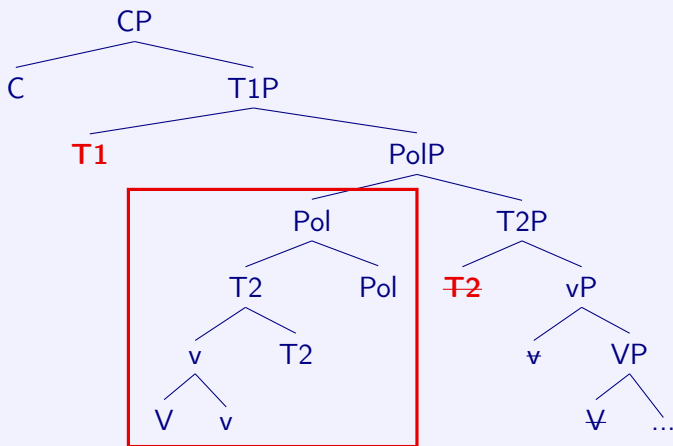
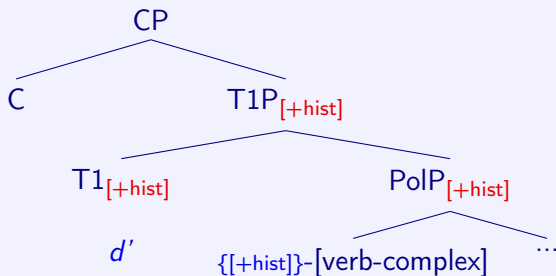
T1: historic/non-historic; **T2:** finer tense distinctions
Verbal complex: {V-v-T2-Pol}

Appendix D: Historic tense lenition

CP
├── C
└── T1P$_{[+hist]}$
    ├── T1$_{[+hist]}$
    │   └── *d'*
    └── PolP$_{[+hist]}$
        ├── {[+hist]}-[verb-complex]
        └── ...

- Historic tense feature originates on T1
- T1P marked as [+hist]
- Inherited by PolP via concord   (Ackema & Neeleman 2020)
- Realised as prefix on leftmost element   (Bermudez-Otero & Payne 2011)
- Pre-verbal *d'* inserted (if phonological conditions met)

Copular clauses in Irish

- Structure: Copular particle – Predicate – Subject
- Only distinguish historic vs. non-historic tense
- Historic tense $\longrightarrow$ lenition on predicate

(16) a. *is   cosúil le   taibhse é*
          COP like   with ghost   he
          'He is like a ghost.'

   b. *ba   **sh**aighdiúirí iad*
       COP.HIST **L**.soldiers   they
       'They were soldiers.'

Historic copular particle *-b*: similar pattern to *d'* (in some contexts)

(17) a. *níor*   ***-bh***   *ealaíontóir í*
          NEG.HIST **L**.COP.HIST artist   she
          'She was not an artist.'

    b. *níor*   ***-bh***   ***fh****eirmeoir í*
          NEG.HIST **L**.COP.HIST **L**.farmer   she
          'She was not a farmer.'

    c. *níor*   *(*-bh)*   ***sh****aighdiúir í*
          NEG.HIST (**L**.COP.HIST) **L**.soldier   she
          'She was not a soldier.'

(Note: Type 1 lenition on *-b* following mutation trigger *níor*-**{L}**)

Appendix F: Definite articles

Compare definite articles for *bád* 'boat' (masc) with *bróg* 'shoe' (fem):

(18) a. *an bád* 'the boat'
      b. *an **bh**róg* 'the **L**.shoe' ⟵ identical phonological form

(19) a. *dath an **bh**áid* 'the colour of the **L**.boat'
      b. *dath na bróige* 'the colour of the shoe' ⟵ distinct form

	M.SG	F.SG
Common	*an*	*an-*{**L**}
Genitive	*an-*{**L**}	*na*

Compare feminine definite article *an*-{**L**} and interrogative particle *an*-{**E**}:

(20)   a.   *an*   *duilleog*/*dhuilleog
               DEF.F (***L**).leaf(F)
               'the leaf'   ⟵ coronal blocking

        b.   *an* **nd***úisíonn*/**dúisíonn tú?*
               Q   *(**E**).wake.PRS   you
               'Do you wake up?'   ⟵ no coronal blocking

- Coronal blocking effect different for eclipsis?
- Interaction with domain/boundary effects?

Coronal blocking in compounds – related to stress assignment?

CB when target bears primary stress:

(21)   a.   *in*-'*dé*anta, *in-'***dh****é*anta 'do-able'
          b.   '*an*-'*dona*, *'*an*-'***dh****ona* 'very bad'

No CB when target bears secondary stress:

(22)   '*mion*-ˌ***th****orthaí*, *'*mion*-ˌ*torthaí* 'micro-products'

(Ó Curnáin 2007)