Basque plural clitics:
A case study in Crossmodular Parallelism

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Joint work on Basque verbal morphology with Karlos Arregi

*Morphotactics* (Arregi & Nevins 2011)

Data Sources:

- Lekeitio (Biscayan): Hualde et al. 1994
- Berastegi (Guipuscoan): de Yrizar 1991
- Ibarrangelu, Kortezubi (Biscayan): Gaminde 1984
- Oñati (Biscayan): Badihardugu 2005
Crossmodular Parallelism

Operations on abstract morphological structures are the same as ones that operate on phonological representations.

▶ Same grammar, but different alphabet: phonological features in segments vs. abstract inflectional features in morphemes.
Precursors

- Arboreal representations of metrical stress (Halle & Vergnaud 1980)
- Syntax-inspired locality principles in vowel harmony (Nevins 2010)
Fission

- Two exponents corresponding to one syntactic terminal node. Hebrew:
  - ti-xtev -u
  - 2- write -PL
  - ni- xtov
  - 1PL- write
- Fission in 2Pl but not 1Pl, even though both have the exact same syntax.
- Split exponence is thus a post-syntactic matter.
Classic Fission in Distributed Morphology

Noyer 1992, Halle 1997:

- Occurs *during* Vocabulary Insertion (postsyntactic assignment of exponence to abstract terminal nodes).
- Certain exponents (Hebrew 1Pl *ni*) match all features on the terminal.
- Others (Hebrew number-neutral 2nd *ti*) incompletely match them. Leftover feature(s) realized by a second instance of Vocabulary Insertion.
- Fission emerges due to the particular inventory of vocabulary entries.
Current study: Basque plural clitics

Fission in 2Pl & 3Pl in clitics adjoined to finite verbs:

- **d-o** -gu
  L -PRS.3SG -CL.E.1PL

- **d-o** -su -e
  L -PRS.3SG -CL.E.2 -CL.E.PL

- **dx-a** -ko -e (>dxake)
  L -PRS.3SG -CL.D.3 -CL.D.PL

(Examples from Lekeitio)
A new post-syntactic mechanism for Fission

Post-syntactic operation on terminal nodes prior to Vocabulary Insertion:

- Logically prior to details in vocabulary entries.
- Inspired by Crossmodular Parallelism: diphthongization in Southern Italian.
- ‘Pied-piping’ of orthogonal features (not a simple person/number split).
- Affords cross-linguistic predictions about recurrent patterns of splitting.
Standard placement of fissioned clitics (e.g. Lekeitio):

Adjacent:

- d -o -su -e
- L -PRS.3SG -CL.E.2 -CL.E.PL

Absolutive plural surfaces further to the right:

- s -aitxu -e -t
- CL.A.2 -PRS.2PL -CL.A.PL -CL.E.1SG
Morpheme placement

Standard placement of fissioned clitics (e.g. Lekeitio):
Adjacent:

▶ d -o -su -e
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Absolutive plural surfaces further to the right:

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Dialectal variation sheds light on the right analysis:

1. Lekeitio: adjacent (absolutive further to the right)
   d -o -tzu -e -t
   L -PRS.3SG -CL.D.2 -CL.D.PL -CL.E.1SG

2. Ibarrangelu: all plural clitics at the right edge
   d -o -tzu -t -e
   L -PRS.3SG -CL.D.2 -CL.E.1SG -CL.D.PL

3. Kortezubi: all plural clitics adjacent and at the right edge
   d -o -tzu -e -t -e
   L -PRS.3SG -CL.D.2 -CL.D.PL -CL.E.1SG -CL.D.PL
Variation

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   d -o  -tzu  -e  -t  -e
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Generalized Reduplication

Harris & Halle 2005: a formalism that unifies displacement & copying

- **Phonology:**
  - full and partial reduplication
  - metathesis

- **Morphology:**
  - morpheme displacement (metathesis)
  - morpheme doubling (partial reduplication)
Generalized Reduplication in Basque clitics

- Analysis inspired by Crossmodal Parallelism:
  - Output of Fission: adjacent morphemes
  - Nonadjacent plural clitics result from Generalized Reduplication
- Formalism predicts all attested variation in placement
Goals of the analysis

To develop an explanation based on Crossmodular Parallelism that:

- provides evidence for particular views of Fission & morpheme placement;
- makes sense of distribution, form and placement of Basque plural clitics;
- makes correct predictions about crossdialectal & crosslinguistic patterns of variation.
Outline

Basque finite auxiliaries

Crossmodular Parallelism: Diphthongization & Fission

Crossmodular Parallelism: Metathesis & morpheme displacement
Outline

Basque finite auxiliaries

Crossmodular Parallelism: Diphthongization & Fission

Crossmodular Parallelism: Metathesis & morpheme displacement
Most finite sentences have a verbal complex with a tensed auxiliary:

- (Gu-k) (seu-∅) ikus-i s-aittu-gu.
- we-ERG you-ABS see-PRF AUX

‘We have seen you.’ Lekeitio (Biscayan)

- s-: 2Sg absolute clitic
- -aittu-: 2Sg agreement, present tense
- -gu: 1Pl ergative clitic
Morphemes in finite auxiliaries

Abs – T/Agr – Dat – Erg – C

- T/Agr includes (present/past) tense and agreement
- C (often null) includes clause-type, tense, and agreement
- Pronominal clitics doubling absolutive, dative, and ergative arguments.
Plural clitics

- Plural clitics are split into two exponents in 2nd and 3rd person
- Plural = Singular + -e, except in 1st person

<table>
<thead>
<tr>
<th></th>
<th>Absolutive</th>
<th>Dative</th>
<th>Ergative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sg</td>
<td>Pl</td>
<td>Sg</td>
</tr>
<tr>
<td>1st</td>
<td>-t/da</td>
<td>-ku</td>
<td>1st</td>
</tr>
<tr>
<td>2nd</td>
<td>-tzu</td>
<td>-tzu-e</td>
<td>2nd</td>
</tr>
<tr>
<td>3rd</td>
<td>-tz/ko</td>
<td>-tz/ko-e</td>
<td>3rd</td>
</tr>
</tbody>
</table>

(Lekeitio)
Stating the problems

Basque clitics sometimes involve **splitting** into 2 exponents:

- Across absolutive, dative and ergative:
  - 1Pl realized as single exponent
  - 2Pl/3Pl: number-neutral exponent + plural exponent (-e)

- Recurrence across cases begs a generalization beyond individual vocabulary entries

Variation in **placement** of -e:

- Within a dialect: adjacent (dative/ergative) vs. nonadjacent (absolutive)
- Across dialects: adjacent vs. nonadjacent; one vs. multiple copies
- Requires unified approach flexible enough to account for variation
Outline

Basque finite auxiliaries

Crossmodular Parallelism: Diphthongization & Fission

Crossmodular Parallelism: Metathesis & morpheme displacement
Metaphony

Southern Italian languages (Calabrese 1998, 2005):

- In some morphological contexts (e.g. plural), stressed mid vowels become high.
Vowel inventory

- $i$ are $[−$high, $−ATR]$  
- $e$ are $[−$high, $+ATR]$  
- $\acute{e}$ are $[+$high, $+ATR]$  
- $\ddot{a}$ are $[+high, −ATR]$: antagonistic features
Metaphony & diphthongization in Arpino plurals

- $[-\text{high}, +\text{ATR}] \rightarrow [+\text{high}, +\text{ATR}]$

<table>
<thead>
<tr>
<th>Singular</th>
<th>Plural</th>
<th>'flower'</th>
</tr>
</thead>
<tbody>
<tr>
<td>fjóreh</td>
<td>fjúreh</td>
<td></td>
</tr>
<tr>
<td>mésh</td>
<td>mísh</td>
<td>'table'</td>
</tr>
</tbody>
</table>

- $[-\text{high}, -\text{ATR}]: *[+\text{high}, -\text{ATR}], \text{triggering diphthongization}$

<table>
<thead>
<tr>
<th>Singular</th>
<th>Plural</th>
<th>'strong'</th>
<th>'worm'</th>
</tr>
</thead>
<tbody>
<tr>
<td>førtah</td>
<td>fwórtah</td>
<td>not *fórtah</td>
<td>not *virmah</td>
</tr>
<tr>
<td>várma</td>
<td>vjérma</td>
<td>'worm'</td>
<td></td>
</tr>
</tbody>
</table>

The two segments in the diphthong share orthogonal features: $[\alpha\backslash\backslash\text{back, }\alpha\backslash\backslash\text{round, }-\text{low}]$
Metaphony & diphthongization in Arpino plurals

- \([-\text{high}, +\text{ATR}] \rightarrow [+\text{high}, +\text{ATR}]\)

<table>
<thead>
<tr>
<th>Singular</th>
<th>Plural</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>fjóðø</td>
<td>fjúðø</td>
<td>‘flower’</td>
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<tr>
<td>mésø</td>
<td>míøsø</td>
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- \([-\text{high}, -\text{ATR}]: * [+\text{high}, -\text{ATR}], \text{triggering diphthongization}\)

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The two segments in the diphthong share orthogonal features:
\([\alpha\text{back}, \alpha\text{round}, -\text{low}]\)
Calabrese: Diphthongization as Fission

Metaphony: \(*[+\text{high}, -\text{ATR}]\)

\[e \rightarrow i\]

\[\mathcal{C} \rightarrow \mathring{u}\]
Calabrese: Diphthongization as Fission

Metaphony: $\varepsilon \rightarrow \iota$

$\varepsilon$ $\rightarrow$ $\iota$

$\varepsilon$ $\rightarrow$ $\iota$

Antagonistic features split into two segments
Calabrese: Diphthongization as Fission

Metaphony: *\([+\text{high}, -\text{ATR}]\)

\[\varepsilon \rightarrow i\]

Antagonistic features split into two segments that share orthogonal features

(Other processes turn \([\text{j}e, w\sigma]\) to surface \([\text{je}, \text{wo}]\))
Diphthongization as Fission

Two crucial properties of this mechanism:

- Certain feature combinations are marked:
  
  \[ *[+_\text{high}, -\text{ATR}] \]

- Fission repair results in 2 segments that share orthogonal features:

  \[
  \begin{bmatrix}
  \alpha F \\
  +\text{high} \\
  -\text{ATR}
  \end{bmatrix}
  \rightarrow
  \begin{bmatrix}
  \alpha F \\
  +\text{high} \\
  \ldots
  \end{bmatrix}
  \begin{bmatrix}
  \alpha F \\
  -\text{ATR} \\
  \ldots
  \end{bmatrix}
  \]
Plural clitics are split into two exponents in 2nd and 3rd person

- Plural = Singular + -e, except in 1st person

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<tr>
<td>2nd</td>
<td>s-</td>
<td>s-...-e</td>
<td>2nd</td>
</tr>
<tr>
<td>3rd</td>
<td>—</td>
<td>—</td>
<td>3rd</td>
</tr>
</tbody>
</table>

(Lekeitio)
Fission in Basque

Modeled on parallel with metaphony-driven diphthongization:

- **Person:**
  - 1st: [+participant, +author]
  - 2nd: [+participant, −author]
  - 3rd: −participant, −author

- **Number:** [±singular]
- *[−author, −singular]* (parallel to Italian *[+high, −ATR]):
  2nd/3rd person clitics can’t be realized together with plural

- **Postsyntactic** (morphological) markedness.
  −author, −singular is fine as far as syntax/semantics is concerned.

- **Fission repair:** split the antagonistic features into 2 separate clitics.
  The fissioned clitics share orthogonal features, as in diphthongization.
No Fission in first person

No Fission:

- Absolutive  
  + participant  
  + author  
  − singular  
  -g-

- Dative  
  + participant  
  + author  
  − singular  
  -ku

- Ergative  
  + participant  
  + author  
  − singular  
  -gu

singular: n-, -t/da, -t/da
No Fission in first person

- No Fission:
  - Absolutive
    - +participant
    - +author
    - -singular
    - $g$-
  - Dative
    - +participant
    - +author
    - -singular
    - -$ku$
  - Ergative
    - +participant
    - +author
    - -singular
    - -$gu$

- singular: $n$-, $-t/da$, $-t/da$
Fission in 2nd/3rd person

Violation of *[−author, −singular], triggering Fission:

▶ 2nd:

\[
\begin{bmatrix}
\text{Abs/Dat/Erg} \\
+\text{participant} \\
-\text{author} \\
-\text{singular}
\end{bmatrix}
\rightarrow
\begin{bmatrix}
\text{Abs/Dat/Erg} \\
+\text{participant} \\
-\text{author} \\
-s\text{(absolutive)} \\
-tzu\text{(dative)} \\
-su\text{(ergative)}
\end{bmatrix}
\begin{bmatrix}
\text{Abs/Dat/Erg} \\
+\text{participant} \\
-\text{author} \\
-\text{singular} \\
-e\text{(absolutive)} \\
-e\text{(dative)} \\
-e\text{(ergative)}
\end{bmatrix}
\]

▶ 3rd:

\[
\begin{bmatrix}
\text{Dat/Erg} \\
-\text{participant} \\
-\text{author} \\
-\text{singular}
\end{bmatrix}
\rightarrow
\begin{bmatrix}
\text{Dat/Erg} \\
-\text{participant} \\
-\text{author} \\
-tz/ko\text{(dative)} \\
-\emptyset\text{(ergative)}
\end{bmatrix}
\begin{bmatrix}
\text{Dat/Erg} \\
-\text{participant} \\
-\text{author} \\
-\text{singular} \\
-e\text{(dative)} \\
-e\text{(ergative)}
\end{bmatrix}
\]

Andrew Nevins (University College London)
Fission in 2nd/3rd person

Violation of *[-author, -singular], triggering Fission:

- **2nd:**
  
  \[
  \begin{array}{c}
  \text{Abs/Dat/Erg} \\
  + \text{participant} \\
  - \text{author} \\
  - \text{singular}
  \end{array}
  \rightarrow
  \begin{array}{c}
  \text{Abs/Dat/Erg} \\
  + \text{participant} \\
  - \text{author} \\
  s- \text{ (absolutive)} \\
  -tzu \text{ (dative)} \\
  -su \text{ (ergative)}
  \end{array}
  \]

- **3rd:**
  
  \[
  \begin{array}{c}
  \text{Dat/Erg} \\
  - \text{participant} \\
  - \text{author} \\
  - \text{singular}
  \end{array}
  \rightarrow
  \begin{array}{c}
  \text{Dat/Erg} \\
  - \text{participant} \\
  - \text{author} \\
  -tz/ko \text{ (dative)} \\
  -\emptyset \text{ (ergative)}
  \end{array}
  \]

Andrew Nevins (University College London)
Plural exponents

Plural clitic in Biscayan (e.g. Lekeitio) is always -e

- **2Pl.Abs:** -e
  - Absolutive
  - +participant
  - −singular

- **2Pl.Dat:** -e
  - Dative
  - +participant
  - −singular

- **2Pl.Erg:** -e
  - Ergative
  - +participant
  - −singular

- **3Pl.Dat:** -e
  - Dative
  - −participant
  - −singular

- **3Pl.Erg:** -e
  - Ergative
  - −participant
  - −singular

► Evidence that orthogonal case and person features must be present?
Plural exponents

Plural clitic in Biscayan (e.g. Lekeitio) is always -e

<table>
<thead>
<tr>
<th>Case</th>
<th>Exponent</th>
<th>Participant</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2Pl.Abs</td>
<td>-e</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>2Pl.Dat</td>
<td>-e</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>2Pl.Erg</td>
<td>-e</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>3Pl.Dat</td>
<td>-e</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3Pl.Erg</td>
<td>-e</td>
<td>-</td>
<td>-</td>
</tr>
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- Evidence that orthogonal case and person features must be present?
Allomorphy in plural exponents

Non-Biscayan: -tele depending on case and person features

Berastegi (Guipuscoan):

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolutive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1sg</td>
<td>n-</td>
<td>g-</td>
</tr>
<tr>
<td>2nd</td>
<td>z-</td>
<td>z-...-te</td>
</tr>
<tr>
<td>3rd</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Dative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>-t/da</td>
<td>-gu</td>
</tr>
<tr>
<td>2nd</td>
<td>-zu</td>
<td>-zu-e</td>
</tr>
<tr>
<td>3rd</td>
<td>-o</td>
<td>-o-e</td>
</tr>
<tr>
<td>Ergative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st</td>
<td>-t/da</td>
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</tr>
<tr>
<td>2nd</td>
<td>-zu</td>
<td>-zu-e</td>
</tr>
<tr>
<td>3rd</td>
<td>-∅</td>
<td>-∅-e</td>
</tr>
</tbody>
</table>

- te: 2Pl.Abs
- e: elsewhere plural

[ Absolutive +participant −singular ]

[ −singular ]
Allomorphy in plural exponents

Non-Biscayan: -tele depending on case and person features

Berastegi (Guipuscoan):

<table>
<thead>
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<tr>
<td>2nd</td>
<td>-zu</td>
<td>-zu-e</td>
</tr>
<tr>
<td>3rd</td>
<td>-o</td>
<td>-o-e</td>
</tr>
</tbody>
</table>

-tele: 2Pl.Abs

-e: elsewhere plural

[ Absolutive +participant −singular ]

[ −singular ]
Both case and number are required to state the distribution of allomorphs.

Understandable if the fissioned clitic is includes case & person features alongside number.
Fission: Summary

Crossmodular Parallelism in Fission:

- Due to (language-particular) constraints on marked feature combinations.
- Splits antagonistic features into 2 elements sharing orthogonal features.
- Same process, but on different primitives: phonological features in segments vs. inflectional features in morphemes.
Previous accounts of Fission in DM:

- Driven by feature specification of exponents realizing morphemes.
- Cannot express the fact that fissed morphemes share orthogonal features.
- Fail to capture cross-categorial generalizations, e.g. 2nd/3rd, not 1st, undergo Fission in all cases in Basque.
- Make no crosslinguistic predictions about recurrent patterns of fission (e.g. 1st vs. 2nd/3rd, as opposed to other logically possible splits)
Exponence co-occurrence constraints

Crosslinguistic generality of $^{±}$[−author, ±singular]:

- Languages in which no plural undergoes Fission.
- Languages in which all plurals undergo Fission.
- No known language Fission in 1st but not in 2nd/3rd.
- No expected pattern of Fission in the singular but not plural.
- So are there other languages with the same pattern as Basque?
Languages with Fission only in 2/3

Georgian object clitics (3rd doesn’t cliticize):

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>m-xatav</td>
<td>gv-xatav</td>
</tr>
<tr>
<td>2</td>
<td>g-xatav</td>
<td>g-xatav-t</td>
</tr>
<tr>
<td>3</td>
<td>xatav</td>
<td>xatav</td>
</tr>
</tbody>
</table>

Kadiwéu object clitics (3rd doesn’t cliticize)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1Sg</td>
<td>i-diki</td>
</tr>
<tr>
<td>1Pl</td>
<td>Go-diki</td>
</tr>
<tr>
<td>2Pl</td>
<td>Ga-dikil-i</td>
</tr>
</tbody>
</table>
General Prospects

Pursuing Fission based on Crossmodular Parallelism leads one to formulate constraints on shared exponence of certain features. Like all constraints, these share the properties of

- stating a generalization across vocabulary entries,
- enabling a division of labor between the constraint and its repair,
- spawning clear crosslinguistic predictions.
Outline

Basque finite auxiliaries

Crossmodular Parallelism: Diphthongization & Fission

Crossmodular Parallelism: Metathesis & morpheme displacement
Placement of plural clitics

Output of Fission: often adjacent morphemes. Lekeitio:

- **Dative & ergative**
  
  \[
  \text{dx} \ -a \ -\text{tzu} \ -e \quad \text{d} \ -o \ -\text{su} \ -e \\
  \text{L} \ -\text{PRS.3SG} \ -\text{CL.D.2} \ -\text{CL.D.PL} \quad \text{L} \ -\text{PRS.3SG} \ -\text{CL.E.2} \ -\text{CL.E.PL}
  \]

- **Person and number not adjacent in absolutes**:
  
  \[
  \text{s} \ -\text{aitxu} \ -e \ -t \\
  \text{CL.A.2} \ -\text{PRS.2PL} \ -\text{CL.A.PL} \ -\text{CL.E.1SG}
  \]
Placement of plural clitics

Summary:

\[ \text{Cl}_{Abs} - T_{Agr} - \text{Pl}_{Abs} - [\text{Cl}_{Dat} - \text{Pl}_{Dat}] - [\text{Cl}_{Erg} - \text{Pl}_{Erg}] - C \]

Lekeitio clitics:

<table>
<thead>
<tr>
<th></th>
<th>Sg</th>
<th>Pl</th>
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<tbody>
<tr>
<td>Absolutive</td>
<td>1sg</td>
<td>n-</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>s-</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>—</td>
</tr>
<tr>
<td>Dative</td>
<td>1st</td>
<td>-(s)t(a)</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>-tzu</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>-tz(a)</td>
</tr>
<tr>
<td>Ergative</td>
<td>1st</td>
<td>-t/da</td>
</tr>
<tr>
<td></td>
<td>2nd</td>
<td>-su</td>
</tr>
<tr>
<td></td>
<td>3rd</td>
<td>-Ø</td>
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</tbody>
</table>
Local Plural Metathesis

\[ \text{Cl}_{Abs} - \text{Pl}_{Abs} - T - \ldots \rightarrow \text{Cl}_{Abs} - T - \text{Pl}_{Abs} - \ldots \]

For Lekeitio *saitxuet*:

- **CL.A.2PL**  –  **PRS.2PL**  –  **CL.E.1SG**  \(\rightarrow\) (Fission)
- **CL.A.2**  –  **CL.A.PL**  –  **PRS.2PL**  –  **CL.E.1SG**  \(\rightarrow\) (Metathesis)
- **CL.A.2**  –  **PRS.2PL**  –  **CL.A.PL**  –  **CL.E.1SG**  \(\rightarrow\) (VI)
- **s**  –  **aitxu**  –  **e**  –  **t**
Spanish imperatives

Similar Pl metathesis (Harris & Halle 2005):

- In-situ plural imperative:
  de \-n \-me \-lo
  give \-IMPR.PL \-me \-it
  ‘Y’all give it to me!’

- Metathesized:
  de \-me \-lo \-n
  give \-me \-it \-IMPR.PL

- Also doubling:
  de \-n \-me \-lo \-n
  give \-IMPR.PL \-me \-it \-IMPR.PL
Spanish imperatives

Similar Pl metathesis (Harris & Halle 2005):

- **In-situ plural imperative:**
  
  de -n -me -lo
  give -IMPR.PL -me -it
  ‘Y’all give it to me!’

- **Metathesized:**
  
  de -me -lo -n
  give -me -it -IMPR.PL

- **Also doubling:**
  
  de -n -me -lo -n
  give -IMPR.PL -me -it -IMPR.PL
Generalized Reduplication

Harris & Halle 2005 (Raimy 2000, Frampton 2009)
Accounts for different phonological operations:

- **Full reduplication:**  
  \[
  \begin{array}{l}
  \text{ABCD } \rightarrow \text{A[BC]D } \rightarrow \text{A–BC–BC–D}
  \\
  \text{ABCD } \rightarrow \text{A[B]C[CD] } \rightarrow \text{A–BC–BC–D}
  \end{array}
  \]

- **Partial reduplication:**  
  \[
  \begin{array}{l}
  \text{ABCD } \rightarrow \text{A[B]C[D] } \rightarrow \text{A–BC–BC–D}
  \\
  \text{ABCD } \rightarrow \text{A[B]C[D] } \rightarrow \text{A–BC–BC–D}
  \end{array}
  \]

- **Metathesis:**  
  \[
  \begin{array}{l}
  \text{ABCD } \rightarrow \text{A[B]C[D] } \rightarrow \text{A–BC–BC–D}
  \\
  \text{ABCD } \rightarrow \text{A[B]C[D] } \rightarrow \text{A–BC–BC–D}
  \end{array}
  \]
Generalized Reduplication

Harris & Halle 2005 (Raimy 2000, Frampton 2009)
Accounts for different phonological operations:

- **Full reduplication:** $[ \ ]$
  \[
  \text{ABCD} \rightarrow \text{A[BC]D} \rightarrow \text{A–BC–BC–D}
  \]

- **Partial reduplication:** $\rangle$ or $\langle$
  \[
  \text{ABCD} \rightarrow \text{A[B\rangle C\rangle D} \rightarrow \\
  \text{A–B \rangle C–BC–D} \rightarrow \\
  \text{A–C–BC–D}
  \]

- **Metathesis:** $\rangle$ and $\langle$
  \[
  \text{ABCD} \rightarrow \text{A[B\rangle C\rangle D} \rightarrow \\
  \text{A–B \rangle C–BC–D} \rightarrow \\
  \text{A–C–B–D}
  \]
Generalized Reduplication

Harris & Halle 2005 (Raimy 2000, Frampton 2009)
Accounts for different phonological operations:

- **Full reduplication:** $[ ]$
  \[
  \]

- **Partial reduplication:** $⟩$ or $⟨$
  \[
  \]

- **Metathesis:** $⟩$ and $⟨$
  \[
  \]

Andrew Nevins  (University College London)  Crossmodular Parallelism  Geneva, 4 Oct 2011  43 / 57
Variation in Spanish imperatives

Generalized Reduplication applied to linearized morphemes explains variation in Spanish imperatives: minimal change in bracketing

- In-situ plural imperative:
  de -n -me -lo
give -IMPR.PL -me -it

- Metathesis
  de[n⟩⟨melo] \rightarrow de– n melo–n melo \rightarrow de–melo–n

- Doubling = partial reduplication
  de[n⟨melo] \rightarrow de–nmelo–n melo \rightarrow de–nmelo–n

Formalization of some types of DM merger
(Marantz 1988, Bobaljik 1995, Embick & Noyer 2001)
Generalized Reduplication in Basque clitics

Local Plural Metathesis

\[ \text{Cl}_{Abs} \text{ Pl}_{Abs} \ T \ X \quad \rightarrow \quad \text{Cl}_{Abs} \left[ \text{Pl}_{Abs} \bigcirc \ T \right] \ X \]

Lekeitio *saitxu*et:

- CL.A.2 CL.A.PL PRS.2PL CL.E.1SG →
- CL.A.2 [CL.A.PL \bigcirc PRS.2PL] CL.E.1SG →
- CL.A.2 CL.A.PL PRS.2PL CL.A.PL PRS.2PL CL.E.1SG →
- CL.A.2 PRS.2PL CL.A.PL CL.E.1SG →
- s aitxu e t
Prediction

- Close formal link metathesis and doubling predicts microvariation in time and space
- the mo-st unkind-est cut
- d-id n’t they lef-t
- Theory developed for displacement literally leads us to expect doubling elsewhere
Dialectal variation

- Some Biscayan dialects have more cases of nonadjacent -e
- This variation provides evidence for Generalized Reduplication
Kortezubi

Additional -e at the right edge:

Lekeitio:
- d -o -su -e -s
- L -PRS.3PL -CL.E.2 -CL.E.PL -3PL

Kortezubi:
- d -o -su -e -s -e
- d -o -tzu -e -t -e
- s -aitxu -e -t -e
- CL.A.2 -PRS.2PL -CL.A.PL -CL.E.1SG
<table>
<thead>
<tr>
<th>Mode</th>
<th>Lekeitio</th>
<th>Kortezubi</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-situ</td>
<td>d-o-su-e-s</td>
<td>d-o-su-e-s-e</td>
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<tr>
<td>Right edge</td>
<td>d-o-tzu-e-t</td>
<td>d-o-tzu-e-t-e</td>
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<tr>
<td>Absolutive</td>
<td>s-aitxu-e-t</td>
<td>s-aitxu-e-t-e</td>
</tr>
<tr>
<td>Spanish</td>
<td>de-n-me-lo</td>
<td>de-n-me-lo-n</td>
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</tbody>
</table>

Doubling
Ibarrangelu

<table>
<thead>
<tr>
<th></th>
<th>Lekeitio In-situ</th>
<th>Kortezubi Right edge copy</th>
<th>Ibarrangelu Right edge only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ergative:</td>
<td>d-o-su-e-s</td>
<td>d-o-su-e-s-e</td>
<td>d-o-su-s-e</td>
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<td>Dative:</td>
<td>d-o-tzu-e-t</td>
<td>d-o-tzu-e-t-e</td>
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<tr>
<td>Absolutive:</td>
<td>s-aitu-e-t</td>
<td>s-aitxu-e-t-e</td>
<td>s-aitxu-t-e</td>
</tr>
<tr>
<td>Spanish:</td>
<td>de-n-me-lo</td>
<td>de-n-me-lo-n</td>
<td>de-me-lo-n</td>
</tr>
<tr>
<td></td>
<td>Doubling</td>
<td></td>
<td>Metathesis</td>
</tr>
</tbody>
</table>
Variation due to minimal change in the rule

- **Lekeitio: in-situ**
  
  L -PRS.3SG -CL.D.2 -CL.D.PL -CL.E.1SG  
  d -o -tzu -e -t

- **Kortezubi: Long Distance Doubling**
  
  L -PRS.3SG -CL.D.2 -[CL.D.PL ⟨ -CL.E.1SG]  
  L -PRS.3SG -CL.D.2 -CL.D.PL -CL.E.1SG -CL.D.PL  
  d -o -tzu -e -t -e

- **Ibarrangelu: Long Distance Metathesis**
  
  L -PRS.3SG -CL.D.2 -[CL.D.PL  ⟨ -CL.E.1SG]  
  L -PRS.3SG -CL.D.2 -CL.E.1SG -CL.D.PL  
  d -o -tzu -t -e -e
Variation due to minimal change in the rule

► Lekeitio: in-situ

\[ L \ -\text{PRS.3SG} \ -\text{CL.D.2} \ -\text{CL.D.PL} \ -\text{CL.E.1SG} \]
\[ d \ -o \ -\text{tzu} \ -e \ -t \]

► Kortezubi: Long Distance Doubling

\[ L \ -\text{PRS.3SG} \ -\text{CL.D.2} \ -[\text{CL.D.PL} \langle \ -\text{CL.E.1SG} \rangle] \]
\[ L \ -\text{PRS.3SG} \ -\text{CL.D.2} \ -\text{CL.D.PL} \ -\text{CL.E.1SG} \ -\text{CL.D.PL} \]
\[ d \ -o \ -\text{tzu} \ -e \ -t \ -e \]

► Ibarrangelu: Long Distance Metathesis

\[ L \ -\text{PRS.3SG} \ -\text{CL.D.2} \ -[\text{CL.D.PL} \langle \ -\text{CL.E.1SG} \rangle] \]
\[ L \ -\text{PRS.3SG} \ -\text{CL.D.2} \ -\text{CL.E.1SG} \ -\text{CL.D.PL} \]
\[ d \ -o \ -\text{tzu} \ -t \ -e \]
Variation due to minimal change in the rule

- **Lekeitio: in-situ**
  
  L -PRS.3SG -CL.D.2 -CL.D.PL -CL.E.1SG
  
  d -o -tzu -e -t

- **Kortezubi: Long Distance Doubling**
  
  L -PRS.3SG -CL.D.2 -[CL.D.PL ⟨ -CL.E.1SG]
  
  L -PRS.3SG -CL.D.2 -CL.D.PL -CL.E.1SG -CL.D.PL
  
  d -o -tzu -e -t -e

- **Ibarrangelu: Long Distance Metathesis**
  
  L -PRS.3SG -CL.D.2 -[CL.D.PL ⟨ ⟨ -CL.E.1SG]
  
  L -PRS.3SG -CL.D.2 -CL.E.1SG -CL.D.PL
  
  d -o -tzu -t -e
Limits on variation: Wackernagel

Word internal second position condition on T:

- All dialects have Local Plural Metathesis of absolutive -e
  \[ Cl_{Abs} \ T \ Pl_{Abs} \quad *Cl_{Abs} \ Pl_{Abs} \ T \]

- No dialect with Local Plural *Doubling* of absolutive -e. Why Not?
  \[ *Cl_{Abs} \ Pl_{Abs} \ T \ Pl_{Abs} \]
Word-internal Wackernagelity: Independent evidence

\[ \text{Cl}_{\text{Abs}} - T_{\text{Agr}} - \text{Cl}_{\text{Dat}} - \text{Cl}_{\text{Erg}} - \text{C} \]

Other effects of Wackernagel condition:

- Satisfied by \( \text{Cl}_{\text{Abs}} \) (syntax)

\[
\begin{align*}
\text{n} & \quad \text{-a} \quad \text{-su} \\
\text{CL.A.1SG} & \quad \text{-PRS.1SG} \quad \text{-CL.E.2SG}
\end{align*}
\]

- If \( \text{Cl}_{\text{Abs}} \) absent, epenthetic L, ...

\[
\begin{align*}
\text{d} & \quad \text{-o} \quad \text{-su} \\
\text{L} & \quad \text{-PRS.3SG} \quad \text{-CL.E.2SG}
\end{align*}
\]

- ... or a metathesized/copied clitic

Metathesized ergative (e.g. Lekeitio):

\[
\begin{align*}
\text{s} & \quad \text{-endu} \quad \text{-an} \\
\text{CL.E.2SG} & \quad \text{-PST.3SG} \quad \text{-CPST}
\end{align*}
\]

Doubled dative (e.g. Oñati):

\[
\begin{align*}
\text{n} & \quad \text{-o} \quad \text{-sta} \quad \text{-su} \quad \text{-n} \\
\text{CL.D.1SG} & \quad \text{-PST.3SG} \quad \text{-CL.D.1SG} \quad \text{-CL.E.2SG} \quad \text{-CPST}
\end{align*}
\]
Word-internal Wackernagelity: Independent evidence

\[ \text{Cl}_{Abs} - T_{Agr} - \text{Cl}_{Dat} - \text{Cl}_{Erg} - C \]

Other effects of Wackernagel condition:

- Satisfied by \( \text{Cl}_{Abs} \) (syntax)
  \( n -a -su \)
  \( \text{CL.A.1SG} -\text{PRS.1SG} -\text{CL.E.2SG} \)

- If \( \text{Cl}_{Abs} \) absent, epenthetic L, ...
  \( d -o -su \)
  \( \text{L} -\text{PRS.3SG} -\text{CL.E.2SG} \)

- … or a metathesized/copied clitic
  Metathesized ergative (e.g. Lekeitio):
  \( s -\text{endu} -an \)
  \( \text{CL.E.2SG} -\text{PST.3SG} -\text{CPST} \)

- Doubled dative (e.g. Oñati):
  \( n -o -\text{sta} -su -n \)
  \( \text{CL.D.1SG} -\text{PST.3SG} -\text{CL.D.1SG} -\text{CL.E.2SG} -\text{CPST} \)
Limits on variation: Person > Number

Person > Number Order (Trommer 2008, Harbour 2008)

Crossdialectal generalizations in Basque:

- In situ Pl is right-adjacent to person clitic
- Plural metathesis is always to the right
  \[ Cl_{Person} \ldots Cl_{Pl} \quad *Cl_{Pl} \ldots Cl_{Person} \]
- In Plural Doubling, the in situ copy is always leftmost
  \[ Cl_{Person} Cl_{Pl} \ldots Cl_{Pl} \quad *Cl_{Pl} \ldots Cl_{Person} Cl_{Pl} \]
Morpheme placement: Summary

Account of placement of plural clitics inspired by Crossmodular Parallelism

- Seemingly idiosyncratic conditions on placement of \(-e\) have a systematic account once we understand variation.
- Variation explained by Generalized Reduplication: unifies metathesis & doubling
- The formalism gives teeth to notion of local dislocation (Embick & Noyer 2001), which didn’t handle doubling
- Constraints (Wackernagel, P>O Order): limits to variation
Basque plural clitics in the light of Crossmodular Parallelism:

- Fission = Diphthongization
  - Predicts sharing of orthogonal features
  - Makes correct predictions about crosslinguistic patterns of Fission
- Placement due to Generalized Reduplication & linear constraints
  - Makes correct predictions about variation in displacement & doubling
  - Constraints limit this variation


