Morphology

Typology in practice, class 5
Typological research (ideally)

1. Formulate research question
2. Decide what and how to measure
3. Collect data
4. Summarize data
5. Analyze data
6. Interpret results
7. Report results
Typological research (ideally)

1. Formulate research question
2. Decide what and how to measure
   - Variables
   - Comparability
   - Domains
   - External variables
3. Collect data
Typological research (ideally)

Goal for today is to come to a research question, by looking at what remains of the possible linguistic variables, so that we can start to...

1. Formulate research question
2. Decide what and how to measure
3. Collect data
Typological research (ideally)

At the end of today’s class we will look at what our language reports should look like, and (hopefully) where in our grammars we should look to find the necessary information.

1. Formulate research question
2. Decide what and how to measure
3. Collect data
Morphological typology
Morphological typology

Some examples

Yurakaré (Van Gijn 2006)
ti-ma-y-mala-ma
1SG-3PL-GO-GO.SG-IMP.SG
‘Go and get them for me!’

Spanish
habl-ó
speak-3SG.PAST.PERF.IND
‘He spoke.’

Bolivian Quechua (Van de Kerke 1996)
much’a-na-chi-na-yki
kiss-REC-CAUS-NOM-2SG
‘You should make them kiss each other.’

Vietnamese (Comrie 1989)
khí tôi đến nhà bạn tôi chúng tôi bắt đầu làm bài
when I come house friend I PLURAL I begin do lesson
‘When I came to my friend’s house, we began to do lessons.’
Morphological typology

A bit of history…

Three types of languages:
1. No-structure languages (Chinese)
2. Agglutinating lgs (Turkish)
3. Inflecting languages
   a. Analytic (French)
   b. Synthetic (Latin)

Friedrich von Schlegel 1772-1829

August von Schlegel 1767-1845
Morphological typology

A bit of history…

Isolating languages: no or little use of affixes

Agglutinating languages: Ideally express one concept per morpheme, and combine morphemes with little to none morphophonological alternation

Inflectional languages: Often fuse together several grammatical categories within one morpheme; often have complex morphophonology in their morpheme combinations.

Incorporating languages: Languages that can treat verb + arguments as a single word.
Morphological typology

A bit of history…

Sapir 1921

Three parameters

1. **Synthesis** (degree of concepts that can be ‘packed’ into a single word)
   - Analytic – Synthetic – Polysynthetic

2. **Technique** (degree of coalescence between morphemes)
   - Isolating – Agglutinating – Fusional – Symbolic

3. **Nature of concepts** (degree of semantic content)
   - Radical – Derivational – Mixed relational – Pure relational
### Morphological Typology

<table>
<thead>
<tr>
<th></th>
<th>analytic</th>
<th>synthetic</th>
<th>polysynthetic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Isolating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agglutinating</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Fusional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A. Aikhenvald (2007) in Shopen (ed.)
Morphological typology

A bit of history…

Greenberg 1960 [1954]

Four indices

1. **Synthesis** (morphemes per word ratio)
   a. Inflection (I/W)
   b. Derivation (D/W)
   c. Compounding (R/W)
2. **Agglutination** (agglutinative constructions per morph juncture)
3. **Position** (prefix per word, suffix per word)
4. **Relational devices** (pure inflectional (non-agreement), agreement, and order per word)
Morphological typology

Bickel & Nichols 2007

Degree of fusion
Isolating > Concatenative > Nonlinear

Flexivity
Flexive > Nonflexive

Semantic density:

Exponence
Cumulative > Separative

Synthesis
Analytic > Synthetic > Polysynthetic

A bit of history…
At the heart of inflectional morphology are FORMATIVES. Formatives are the markers of inflectional information. They are different from WORDS in that they cannot govern or be governed by other words, cannot require or undergo agreement, and cannot head phrases: formatives are morphological entities, words syntactic.

Die Kinder standen um den Brunnen.

Renate sah aus dem Fenster.

Der Apfelbaum stand ausserhalb des Gartens.
At the heart of inflectional morphology are FORMATIVES. Formatives are the markers of inflectional information. They are different from WORDS in that they cannot govern or be governed by other words, cannot require or undergo agreement, and cannot head phrases: formatives are morphological entities, words syntactic.

Abkhaz, Hewitt 1979, taken from Bakker 2013

a-jàyas       a-q’nà
def-river     3sg-at
‘at the river’

sarà         s-q’ənt˚
I             1sg-from
‘from me’
At the heart of inflectional morphology are FORMATIVES. Formatives are the markers of inflectional information. They are different from WORDS in that they cannot govern or be governed by other words, cannot require or undergo agreement, and cannot head phrases: formatives are morphological entities, words syntactic.

Kiribati (Groves et al. 1985: 65), taken from Bakker 2013

<table>
<thead>
<tr>
<th>nako-ia</th>
<th>mooa</th>
</tr>
</thead>
<tbody>
<tr>
<td>to-3pl</td>
<td>chickens</td>
</tr>
<tr>
<td>‘to the chickens’</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>nako</th>
<th>taian</th>
<th>nii</th>
</tr>
</thead>
<tbody>
<tr>
<td>to</td>
<td>art</td>
<td>coconut.trees</td>
</tr>
<tr>
<td>‘to the coconut trees’</td>
<td></td>
<td></td>
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<th>bound</th>
<th>free</th>
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<tbody>
<tr>
<td>word</td>
<td></td>
<td></td>
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<tr>
<td>formative</td>
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<td></td>
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<td>formative</td>
<td>German case markers</td>
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Lai Chin (Bickel & Nichols 2007: 173)

tsewmáŋ niʔ ?a-ka-thoʔŋ
Tsew Máŋ ERG 3SG.A-1SG.P-hit
‘Tsew Mang hit me.’
At the heart of inflectional morphology are FORMATIVES. Formatives are the markers of inflectional information. They are different from WORDS in that they cannot govern or be governed by other words, cannot require or undergo agreement, and cannot head phrases: formatives are morphological entities, words syntactic.

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Russian (Bickel & Nichols 2007: 174)

<table>
<thead>
<tr>
<th>[addrugə]</th>
<th>[zdrugəm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ot=druga</td>
<td>s=drugom</td>
</tr>
<tr>
<td>from=friend:gen.sg</td>
<td>with=friend:ins.sg</td>
</tr>
<tr>
<td>‘from the/a friend’</td>
<td>‘with the/a friend’</td>
</tr>
</tbody>
</table>
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Clitics are CATEGORIALLY UNRESTRICTED BOUND FORMATIVES, i.e., formatives that are unrestricted as to the syntactic category of the word they attach to.

Yurakaré (own field data)

```
mala-y  matata  sibbë   =chi
go-l    big      house   =to
‘I went to the big house.’

mala-y  sibbë  matata  =chi
go-l    house  big     =to
‘I went to the big house.’
```
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‘I went to the big house.’
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Kwak’ala (Wakashan; NW America; S. R. Anderson (1985b)), in Bickel & Nichols 2007: 176

nep’id=i=da
throw=subj=det
gənanəm=x.a
child=inf

gukw=sa
house=instr

t’isəm
rock

‘The child threw a rock at the house’
Fusion

Degree of fusion
Isolating > Concatenative > Nonlinear

Maori (Bauer 1993: 268): Isolating accusative marker

ka kapo au i te puu
T/A snatch 1s ACC the gun
‘I snatched the gun’
Fusion

Degree of fusion
Isolating > Concatenative > Nonlinear

Hindi (Mohanan 1994): Concatenative ergative marker

lāa-ne keḷaa uṭhaayaa.
Ila-ERG.FEM banana lift-PERF.MASC
‘Ila picked up a/the banana.’
Fusion

Degree of fusion
Isolating > Concatenative > Nonlinear

Nias (Brown 2001): Replacive

La-bunu      mbaβi (baβi)
3p.RLS-kill    pig:MUT
They killed a pig.
Degree of fusion
Isolating > Concatenative > Nonlinear

Fongbe 3rdp accusative vs nominative pronouns (Lefebvre et al. 2002: 63): Tonal

<table>
<thead>
<tr>
<th></th>
<th>3sg.nom</th>
<th>3sg.acc</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>é</em></td>
<td>3sg.nom</td>
<td>3sg.acc</td>
</tr>
</tbody>
</table>

Case on pronouns in many Germanic languages: Suppletion

<table>
<thead>
<tr>
<th>Language</th>
<th>Nominative</th>
<th>Accusative</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>I</td>
<td>me</td>
</tr>
<tr>
<td>Dutch</td>
<td>ik</td>
<td>mij/me</td>
</tr>
<tr>
<td>German</td>
<td>ich</td>
<td>mich</td>
</tr>
</tbody>
</table>
"The hallmark of flexive formatives is that their variation is item-based, i.e. allomorphs are selected by some lexical contexts and not by others." (p. 184-5)

Flexivity does not refer to variation that can be explained by regular morphophonological rules.

e.g. Warlpiri

dominâ 'mistress'
dominâ 'master'
dominâ 'war'
dominâ 'consult'
dominâ 'citizen'
dominâ 'hand'
dominâ 'day'

From Blake 2001
Flexivity and fusion are orthogonal features, all combinations occur

<table>
<thead>
<tr>
<th>Flexivity</th>
<th>Isolating</th>
<th>Concatenative</th>
<th>Nonlinear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonflexive</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sierra Otomí (B&N, p. 187)

<table>
<thead>
<tr>
<th>Word</th>
<th>Stems</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>dí</td>
<td>pěʔtsʔi</td>
<td>‘I keep (it)’</td>
</tr>
<tr>
<td>dín</td>
<td>nú</td>
<td>‘I see (it)’</td>
</tr>
<tr>
<td>dídí</td>
<td>hóki</td>
<td>‘I fix (it)’</td>
</tr>
<tr>
<td>dídím</td>
<td>pèpfi</td>
<td>‘I work’</td>
</tr>
</tbody>
</table>

1sg verb
Flexivity x Fusion

<table>
<thead>
<tr>
<th></th>
<th>Isolating</th>
<th>Concatenative</th>
<th>Nonlinear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexive</td>
<td>Sierra Otomí</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonflexive</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.2 Latin case paradigms

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3a</th>
<th>3b</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>á-stems</td>
<td>feminine</td>
<td>masculine</td>
<td>neuter</td>
<td>cons.stems</td>
<td>i-stems</td>
<td>u-stems</td>
</tr>
<tr>
<td>domina</td>
<td>'mistress'</td>
<td>'master'</td>
<td>'war'</td>
<td>'consul'</td>
<td>'citizen'</td>
<td>'hand'</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case</th>
<th>Nominative</th>
<th>Vocative</th>
<th>Accusative</th>
<th>Genitive</th>
<th>Dative</th>
<th>Ablative</th>
</tr>
</thead>
<tbody>
<tr>
<td>singular</td>
<td>domina</td>
<td>domínus</td>
<td>bellum</td>
<td>cónsul</td>
<td>cívís</td>
<td>manus</td>
</tr>
<tr>
<td></td>
<td>domínæ</td>
<td>domini</td>
<td>bellī</td>
<td>cónsulis</td>
<td>cívīs</td>
<td>manūs</td>
</tr>
<tr>
<td></td>
<td>dominī</td>
<td>belō</td>
<td>cónsulī</td>
<td>cívī</td>
<td>manū</td>
<td>dīēi</td>
</tr>
<tr>
<td></td>
<td>dominō</td>
<td>belō</td>
<td>cónsule</td>
<td>cívǐ</td>
<td>manū</td>
<td>dīē</td>
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<tr>
<td></td>
<td>dominā</td>
<td>dominō</td>
<td>bellō</td>
<td>cónsule</td>
<td>cívǐ</td>
<td>manū</td>
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<tr>
<td></td>
<td>dominā</td>
<td>dominō</td>
<td>bellō</td>
<td>cónsule</td>
<td>cívǐ</td>
<td>manū</td>
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<td></td>
<td>dominā</td>
<td>dominō</td>
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<td>cónsule</td>
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<td>manū</td>
</tr>
<tr>
<td></td>
<td>dominā</td>
<td>dominō</td>
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<td>cónsule</td>
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<td>manū</td>
</tr>
<tr>
<td></td>
<td>dominā</td>
<td>dominō</td>
<td>bellō</td>
<td>cónsule</td>
<td>cívǐ</td>
<td>manū</td>
</tr>
</tbody>
</table>

Blake 2001: 4
## Flexivity

### Flexivity x Fusion

<table>
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<th></th>
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<th>Nonlinear</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexive</td>
<td>Sierra Otomí</td>
<td>Latin</td>
<td></td>
</tr>
<tr>
<td>Nonflexive</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Modern Hebrew**

- gadar: ‘He enclosed.’
- yi-gadar: ‘He will enclose.’
- kipel: ‘He folded.’
- ye-kapel: ‘He will fold.’
### Flexivity x Fusion

<table>
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</tr>
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<tbody>
<tr>
<td>Flexive</td>
<td>Sierra Otomí</td>
<td>Latin</td>
<td>Mod. Hebrew</td>
</tr>
<tr>
<td>Nonflexive</td>
<td>Maori</td>
<td>Hindi</td>
<td>Nias</td>
</tr>
</tbody>
</table>
Semantic density

How semantically dense are formatives?
How semantically dense are words?

Semantic density

Exponence

Formative level

Synthesis

Word level
The degree to which different categories are grouped together in single, indivisible formatives.

Exponence
Separative-cumulative

Separative

Cumulative

Yurakaré (Van Gijn 2006)
ti-ma-y-mala-ma
1SG-3PL-GO-GO.SG-IMP.SG
‘Go and get them for me!’

Spanish
habl-ó
speak-3SG.PAST.PERF.IND
‘He spoke.’
Orthogonal to flexivity (examples in B&N, p. 189)

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<thead>
<tr>
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<th>Nonflexive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separative</td>
<td>Turkish, e.g. pers/num agr</td>
<td>Turkish, e.g. case, number</td>
</tr>
<tr>
<td>Cumulative</td>
<td>Latin case</td>
<td>Dumi person, number, tense</td>
</tr>
</tbody>
</table>
Orthogonal to fusion (examples in B&N, p. 189, and above)

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<th></th>
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<th>Nonlinear</th>
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<tbody>
<tr>
<td>Separative</td>
<td>Maori case</td>
<td>Yurakaré case</td>
<td>Nias case</td>
</tr>
<tr>
<td>Cumulative</td>
<td>Hausa</td>
<td>Yurakaré agreement</td>
<td>English ‘be’ paradigm: tense &amp; pers</td>
</tr>
</tbody>
</table>
Hausa

a. Mūsā yā tafi Bici
m. 3sg.masc:compl go b.
‘Musa went / has gone to Bichi’

b. yârâ sun ga maciçi-n?
children 3pl.compl see snake-art.pl
‘Did the children see the snake?’
Position

Position of marker: praee-in-post-simul

The location of an inflectional formative relative to the word or root that hosts it.

<table>
<thead>
<tr>
<th>Position</th>
<th>Formative type and/or degree of fusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prae</td>
<td>Preposed free formative *</td>
</tr>
<tr>
<td></td>
<td>Proclitic</td>
</tr>
<tr>
<td></td>
<td>Prefix</td>
</tr>
<tr>
<td></td>
<td>Initial reduplication (cf. Ancient Greek example in Section 2.3.4 for illustration)</td>
</tr>
<tr>
<td>In</td>
<td>Substitution (cf. Section 2.3.4)</td>
</tr>
<tr>
<td></td>
<td>Ablaut (i.e. bare ablaut; if ablaut is triggered by an affix, the combination of affix and ablaut constitutes simulfication, described below)</td>
</tr>
<tr>
<td></td>
<td>Infix (including Interposition *)</td>
</tr>
<tr>
<td></td>
<td>Endoclisis *</td>
</tr>
<tr>
<td></td>
<td>Subtraction (cf. Tohono 'O'odham example in Section 2.3.4)</td>
</tr>
<tr>
<td></td>
<td>Prosodic formatives (cf. Kinyarwanda example in Section 2.3.4)</td>
</tr>
<tr>
<td>Post</td>
<td>Final reduplication</td>
</tr>
<tr>
<td></td>
<td>Suffix</td>
</tr>
<tr>
<td></td>
<td>Enclitic</td>
</tr>
<tr>
<td></td>
<td>Postposed free formative</td>
</tr>
<tr>
<td>Simul</td>
<td>Simulfic, simulclitic, etc. (including circumfix) *</td>
</tr>
<tr>
<td>None of the above</td>
<td>Detached (word or formative, cliticized or free; see Sections 2.2 and 3.1 for discussion)</td>
</tr>
</tbody>
</table>
Free formatives with fixed position

Yapese (Austronesian, Dryer 1989 - Jensen 1977)

ea rea kaarroo neey
art sg car this
‘this car’

ea pi kaarroo neey
art pl car this
‘these cars’
Position

Position of marker: prae-in-post-simul

Infixation

Philippines (Tagalog)

bili  ‘buy’
\(b\text{-}\text{-}\text{-}\text{um-}\text{-}\text{-}\text{i}li\)  ‘bought’
Endoclisis

Udi (Nakh-Daghestanian, Caucasus; Harris 2000)

kaghuz-ax a=z=q'-e
letter-DAT Σ=1SG=receive-AOR
‘I received the letter.’
Yurakaré: final reduplication

dyomoj~dyo
get.up~CAUS
‘Lift (someone/something).’
Position

Position of marker: prae-in-post-simul

German
ge-mach-t
PERF.PRTC-make-PERF.PRTC
‘I’ve gone.’

Belhare
khai-ŋa-ŋŋ-ŋu-
PERF-1SG-PERF
‘I’ve gone.’
Position of marker: prae-in-post-simul

German: nonlinear+concatenative

der Stab / die Stäbe
der Turm / die Türme
die Not / die Nöte
der Wald / die Wälder
das Haus / die Häuser
B&N 2013 in WALS: inflectional synthesis is measured by the number of categories per word

**Spanish**
habl-ó
speak-3SG.PAST.PERF.IND
‘He spoke.’

**Bolivian Quechua (Van de Kerke 1996)**
much’a-na-chi-na-yki
kiss-REC-CAUS-NOM-2SG
‘You should make them kiss each other.’
Synthesis
1. **Domain:** case markers as found on dependents, excluding alternative expression modes (agreement, adpositions, word order -- see «linguistic variables». We follow Bickel & Nichols in their definition of adpositions.

2. **External variables:** we keep track of at least affiliation, latitude-longitude and wals code in order to be compatible with WALS. Other external variables?

3. **Linguistic variables:** the morphological form of case markers as defined in 1. We keep track of (at least) fusion, flexivity, exponence, and position.
1. Meta-data / profile data
2. Case marking & alternative devices
3. Form of case markers
   3.1. Fusion
   3.2. Flexivity
   3.3. Exponence
   3.4. Position