Morphology

From agglutinating to compli-freakin'-cated

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What is morphology?

The nuts and bolts of *words*:

- What are the building blocks of words?
- How are words built?
- What (else) goes on inside of a word to determine its form?

unbelievable
unlockable
nonrefundable

nonrefundable
vs. not able to be refunded

What is a word?

A tightly-bound constituent…

- that is smaller than a phrase
- but big enough to “stand alone” (?)

(see e.g.: Marantz 1997, Julien 2002, Dixon & Aikhenvald 2003)

Why should YOU care about morphology?

You can't analyze any language data* without doing morphology!

- Identifying words/word boundaries
- Figuring out what words mean

→ *Your (implicit) assumptions about how morphology works affects your analyses!*

Morphology is at the crux of phonology, syntax, and semantics. You can't hope to understand the architecture of the grammar—how all the pieces fit together—without understanding morphology.

Roadmap

1. What does morphology *look like* across languages?
    a. order…
    b. …and chaos
2. Finding order in the chaos
    a. edges
    b. pieces
    c. syntax
3. The bigger picture

what morphology looks like

Movima (Bolivia; Haude 2006)

roya	‘house’	**roya:ti’**	‘to build a house’
bayɬim	‘field’	**bayɬimti’**	‘to work a field’
mo’incho	‘*chivé* drink’	**mo’incho:ti’**	‘to make a *chivé* drink’
tijerones	‘shafts’	**tijeronesti’**	‘to make shafts’
des’ayuno	‘breakfast’	**des’ayuno:ti’**	‘to make breakfast’

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Morpheme

the classic unit of analysis when breaking down words

= the smallest unit of systematic correspondence between phonological form and meaning/function

roya	= house
bayɬim	= field
…	
-ti’	= VBLZ

Morpheme

the classic unit of analysis when breaking down words

= the smallest unit of systematic correspondence
between phonological form and meaning/function

un-believe-able
un-lock-able
non-re-fund-able

Agglutination

Turkish (Inkelas and Orgun 2003)

tarhanaydıysada ‘even if it was dried curd’

tarhana	-y	-dı	-y	-sa	-da
dried.curd	-COP	-PAST	-COP	-COND	-PRT

But…

Nias Selatan (Indonesia; Brown 2001)

fakhe	**v**akhe	(rice; w/CASE)
si’o	**z**i’o	(stick; w/CASE)
tanö	**d**anö	(land; w/CASE)
kefe	**g**efe	(money; w/CASE)

= Consonant mutation

Huallaga Quechua (Peru; Weber 1989)

uma	um**a:**	(head; w/1POSS)
wasi	was**i:**	(house; w/1POSS)
punchu	punch**u:**	(poncho; w/1POSS)

= Lengthening

And more…

Movima (Bolivia; Haude 2006)

salmo	sal**a’**mo	(return; w/IRR)
janwit	jan**a’**wit	(damage; w/IRR)
ji:sa	ji**ka’**sa	(make; w/IRR)

= **Infixation**

Mukah Melanau (Malaysia; Blust 1997)

t**ə**tək	t**u**tək	t**i**tək	(cut; w/ACT; w/PASS)
s**ə**kəl	s**u**kəl	s**i**kəl	(strangle; w/ACT; w/PASS)
g**ə**gɑ	g**u**gɑ	g**i**gɑ	(chase; w/ACT; w/PASS)

= **Ablaut**

And even more…

Gwari (Nigeria; Adeniyi and Elugbe 2018)

gbàdùmá	gb**á**dùmá	(banana; w/GEN)
bɛ̀gjɛ̀	b**ɛ́**gjɛ̀	(neck; w/GEN)
gbɛ́gbɛ́	gb**ɛ́**gbɛ́	(grass; w/GEN)

= Tone change

Manam (Papua New Guinea; Lichtenberk 1983)

salága	salaga**lága**	(be.long; w/CAT)
zíŋ	zin**zíŋ**	(ashes; w/CAT)
malabóŋ	malabom**bóŋ**	(flying fox; w/CAT)

= Reduplication

Taking stock

t**ə**tək	t**u**tək	t**i**tək	(cut; w/ACT; w/PASS)
s**ə**kəl	s**u**kəl	s**i**kəl	(strangle; w/ACT; w/PASS)
g**ə**gɑ	g**u**gɑ	g**i**gɑ	(chase; w/ACT; w/PASS)

fakhe	**v**akhe	(rice; w/CASE)
si’o	**z**i’o	(stick; w/CASE)
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uma	um**a:**	(head; w/1POSS)
wasi	was**i:**	(house; w/1POSS)
punchu	punch**u:**	(poncho; w/1POSS)

roya	roya:**ti’**	(house; w/VBLZ)
bayɬim	bayɬim**ti’**	(field; w/VBLZ)
mo’incho	mo’incho:**ti’**	(*chivé* drink; w/VBLZ)

salmo	sal**a’**mo	(return; w/IRR)
janwit	jan**a’**wit	(damage; w/IRR)
ji:sa	ji**ka’**sa	(make; w/IRR)

salága	salagal**ága**	(be.long; w/CAT)
zíŋ	zinz**íŋ**	(ashes; w/CAT)
malabóŋ	malabomb**óŋ**	(flying fox; w/CAT)

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bɛ̀gjɛ̀	b**ɛ́**gjɛ̀	(neck; w/GEN)
gbɛ́gbɛ́	gb**ɛ́**gbɛ́	(grass; w/GEN)

And more…
(see e.g. Inkelas 2014)

Now what?!

Is morphology anything goes? Or is there order in the apparent chaos?

The generative perspective: There is order in the chaos. It is possible (and desirable!) to build a constrained model of natural language morphology.

THE PUZZLE: Finding the order; building the model

Some big questions:

- Are morphemes the basic unit of analysis in morphology?
- Is morphology special, operating in ways totally distinct from other areas of the grammar?

finding order in the chaos:
EDGES

Nias Selatan (Indonesia; Brown 2001)

fakhe	**v**akhe	(rice; w/CASE)
si’o	**z**i’o	(stick; w/CASE)
tanö	**d**anö	(land; w/CASE)
kefe	**g**efe	(money; w/CASE)

= Mutation of FIRST consonant

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uma	um**a:**	(head; w/1POSS)
wasi	was**i:**	(house; w/1POSS)
punchu	punch**u:**	(poncho; w/1POSS)

= Lengthening of FINAL vowel

Mukah Melanau (Malaysia; Blust 1997)

t**ə**tək	t**u**tək	t**i**tək	(cut; +ACT; +PASS)
s**ə**kəl	s**u**kəl	s**i**kəl	(strangle; +ACT; +PASS)
g**ə**gɑ	g**u**gɑ	g**i**gɑ	(chase; +ACT; +PASS)

= Ablaut of FIRST vowel

Gwari (Nigeria; Adeniyi and Elugbe 2018)

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bɛ̀gjɛ̀	b**ɛ́**gjɛ̀	(neck; w/GEN)
gbɛ́gbɛ́	gb**ɛ́**gbɛ́	(grass; w/GEN)

= Tone change of FIRST vowel/syllable

Manam (Papua New Guinea; Lichtenberk 1983)

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malabóŋ	malabom**bóŋ**	(flying fox; w/CAT)

= Reduplication of LAST foot

Movima (Bolivia; Haude 2006)

salmo	sal**a’**mo	(return; w/IRR)
janwit	jan**a’**wit	(damage; w/IRR)
ji:sa	ji**ka’**sa	(make; w/IRR)

= Infixation into… MIDDLE??

Even infixes are at the edge!

Movima (Bolivia; Haude 2006)

salmo	sal**a’**mo	(return; w/IRR)
janwit	jan**a’**wit	(damage; w/IRR)
ji:sa	ji**ka’**sa	(make; w/IRR)

= Infixation after FIRST foot

Yu 2007: A typological study of 154 infixes…

- 137 appear adjacent to the FIRST or LAST element of a certain type in the stem (consonant, vowel, syllable, [foot])
- 17 are placed relative to stress/prominence in the stem

Kalin 2022a: A typological study of 51 cases of infix allomorphy…

- The very edge of the stem is crucially implicated in allomorph choice!

Observation 1:

Process morphology affects the **edge** of the stem.

Observation 2:

Affixes are also at the **edge**.

Possibility:

Maybe affixation (i.e., the addition of a piece) is involved in process morphology.

Puzzle:

How can *pieces* make *processes*?

finding order in the chaos: **PIECES**

Nias Selatan (Indonesia; Brown 2001)

fakhe	**v**akhe	(rice; w/CASE)
si’o	**z**i’o	(stick; w/CASE)
tanö	**d**anö	(land; w/CASE)
kefe	**g**efe	(money; w/CASE)

= [+VOICE] prefix

Ex: [+VOICE]-kefe → **g**efe

Huallaga Quechua (Peru; Weber 1989)

uma	um**a:**	(head; w/1POSS)
wasi	was**i:**	(house; w/1POSS)
punchu	punch**u:**	(poncho; w/1POSS)

= μ suffix

Ex: punchu-μ → punch**u:**

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s**ə**kəl	s**u**kəl	s**i**kəl	(strangle; w/ACT; w/PASS)
g**ə**gɑ	g**u**gɑ	g**i**gɑ	(chase; w/ACT; w/PASS)

= [+HIGH,+BACK] prefix;
[+HIGH,-BACK] prefix

Ex: [+H,+B]-gəgɑ→ g**u**gɑ

Gwari (Nigeria; Adeniyi and Elugbe 2018)

gbàdùmá	gb**á**dùmá	(banana; w/GEN)
bɛ̀gjɛ̀	b**ɛ́**gjɛ̀	(neck; w/GEN)
gbɛ́gbɛ́	gb**ɛ́**gbɛ́	(grass; w/GEN)

= H tone prefix

Ex: H-gbàdùmá → gb**á**dùmá

Manam (Papua New Guinea; Lichtenberk 1983)

salága	salaga**lága**	(be.long; w/CAT)
zíŋ	zin**zíŋ**	(ashes; w/CAT)
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= melody-free Ft suffix

Ex: salága-Ft → salága**lága**

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salmo	sal**a’**mo	(return; w/IRR)
janwit	jan**a’**wit	(damage; w/IRR)
ji:sa	ji**ka’**sa	(make; w/IRR)

= ???

Infixes are (first) prefixes/suffixes

Kalin 2022a: A typological study of 51 cases of infix allomorphy…

- The very edge of the stem is crucially implicated in allomorph choice!

Hunzib (Dagestan; van den Berg 1995; Kalin 2022b)

ãqaa	ãqaa**baa**	(be.thirsty; w/VPL)
miyawdaa	miyawdaa**baa**	(mew; w/VPL)
ek	e**yɑ**k	(fall; w/VPL)
šoše	šo**wɑ**še	(bandage; w/VPL)

= **suffix baa** (on V:-final stems)
suffix ɑ (elsewhere; and with a condition: _V)

➔ At some abstract level, the morphemes giving rise to infixes are actually prefixes or suffixes.

Infixes are (first) prefixes/suffixes

Movima (Bolivia; Haude 2006)

salmo	sal**a’**mo	(return; w/IRR)
janwit	jan**a’**wit	(damage; w/IRR)
ji:sa	ji**ka’**sa	(make; w/IRR)

= prefix (k)a’
(placement condition: Ft_)

Ex: (k)a’-salmo → sal**a’**mo

Observation 1:

Process morphology can be recast as affixation, i.e., addition of **a piece.** (For relevant background, and recent dev.: Goldsmith 1976, Marantz 1982, Lieber 1992, Sande To appear…)

Observation 2:

Syntax also operates based on **pieces**.

Possibility:

Maybe the *morphological* combination of pieces is really just *syntactic*.

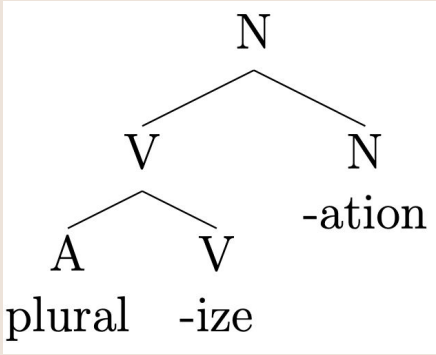
Puzzle:

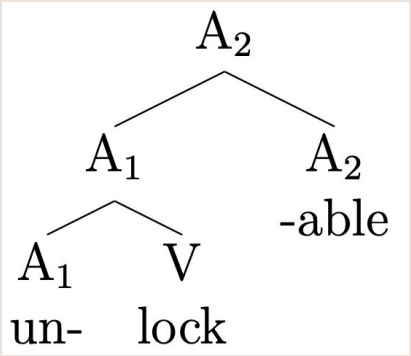
Are morphology and syntax alike?

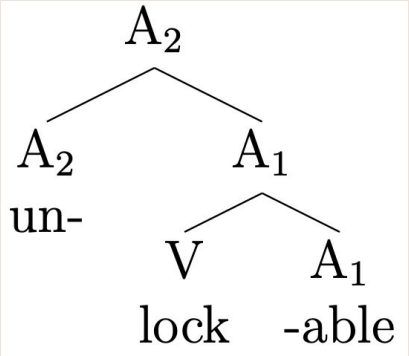
finding order in the chaos: **SYNTAX**

Structure inside words

- Words are endocentric; they have heads that project.
- Morphemes have selectional properties that must be satisfied under structural sisterhood.
- There are constituents inside words.
- Words can have structural ambiguities.
- Word-formation is productive.



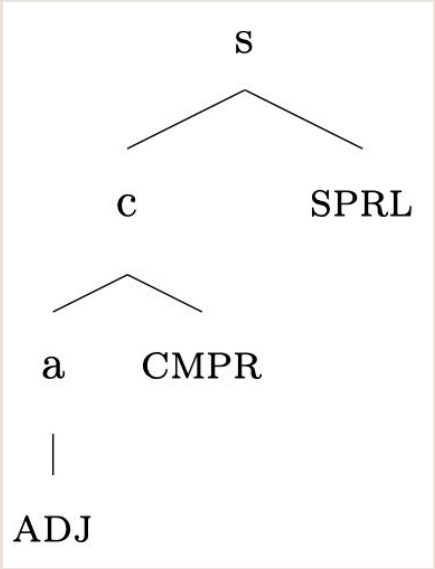




Structure inside words

- Structure-sensitive operations take place in words, e.g., **allomorphy**:
  - Allomorphy is sensitive to **containment** (Bobaljik 2012)

	Plain	Comparative	Superlative
English:	**long** (A) **bad** (A)	**long**er (A) **worse** (B)	**long**est (A) **wors**t (B)
Latin:	**bon**us (A)	**mel**ior (B)	**opt**imus (C)
BUT, *:	**bad** (A)	**worse** (B)	**badd**est (A)

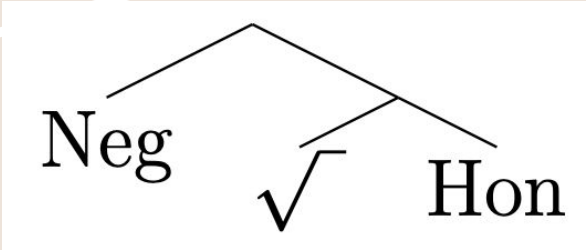


Structure inside words

- Structure-sensitive operations take place in words, e.g., **allomorphy**:
  - Relative **structural locality** affects allomorphy
    (see, e.g., Kalin and Atlamaz 2018, Choi & Harley 2019, Paparounas To appear)

Korean (Choi & Harley 2019)

$\sqrt{\text{EXIST}} \leftrightarrow$ *kyeysi-* / [[___] [v^0 Hon^0]$_{v^0}$]
$\sqrt{\text{EXIST}} \leftrightarrow$ *eps-* / [Neg^0=[[___ v^0]$_{v^0}$]
$\sqrt{\text{EXIST}} \leftrightarrow$ *iss-* / elsewhere



Halapeci-kkeyse pang-ey an(i)=kyeysi-ess-ta.
grandfather-NOM.HON room-in NEG=exist.HON-PST-DECL
'Grandfather was not in the room.'

Structure inside words

- Structure-sensitive operations take place in words, e.g., **allomorphy**:
  - Choice of exponents proceeds **bottom-up** in a structure.
    - Phonologically-conditioned suppletive allomorphy is always inwardly-sensitive
      (Carstairs 1988, 1990, Dolbey 1997, Paster 2005, 2006, 2009, Bobaljik 2000)
    - Infixation is inward-looking and inward-moving (Kalin 2022a)
    - Infixes are transparent for insertion of inner morphemes
      (Embick 2010, Kalin 2020, 2022a, 2022b, To appear)
    - Non-local phonological effects arise in the interaction between exponent choice and movement
      (Hyman 2000, 2003, Kiparsky 2011, Myler 2017)

The Mirror Principle

= *Word-internal structures/derivations mirror syntactic ones* *(Baker 1985)*

Quechua (S. America; Muysken 1981a,b)

maqa-**naku**-ya-**chi**-n
beat-**REC**-DUR-**CAUS**-3SBJ
‘He is causing them$_i$ to beat each other$_i$.’

maqa-**chi**-**naku**-rka-n
beat-**CAUS**-**REC**-PL-3SBJ
‘They$_i$ made someone beat each other$_i$.’

Yoruba (W. Africa; Cinque 2014)

Ǹjé	Adé	**yóò**	**máa**	**wá**	ní ìṛòlẹ́
Q	Ade	**FUT**	**HAB**	**come**	in evening

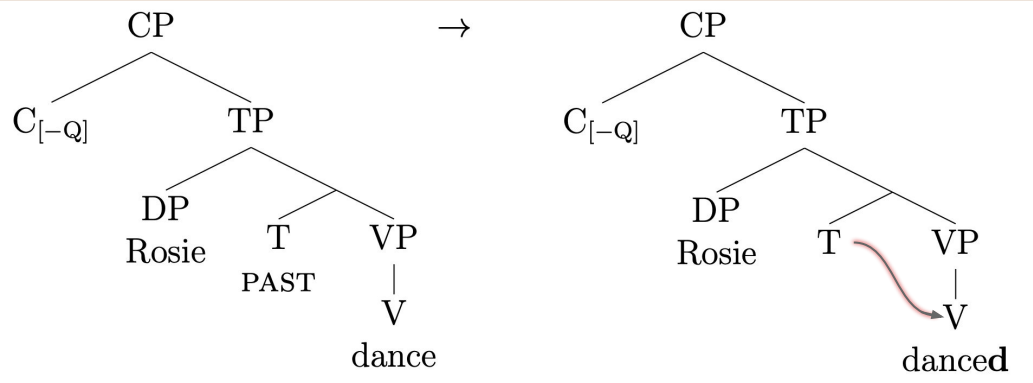
‘Will Ade be coming in the evenings?’

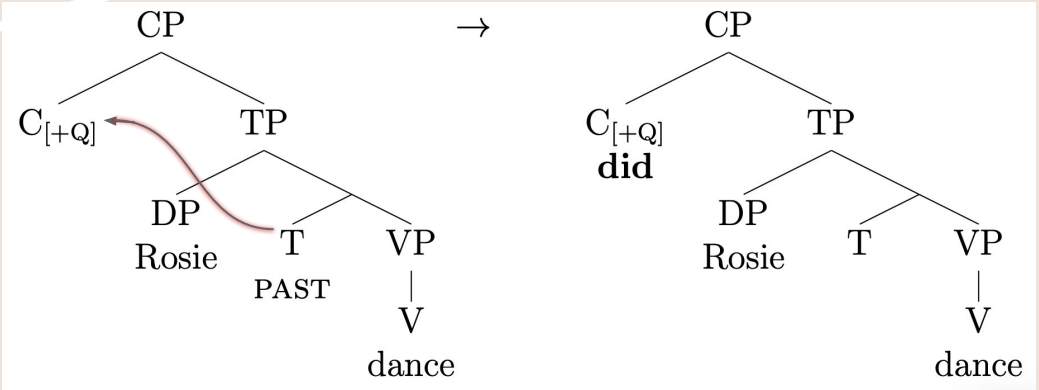
Sabanê (Brazil; Cinque 2014)

Uli	**ay**-i-**say**-**al**-**a**
2SBJ	**go**-V-**PROG**-**PRES**-**Q**

‘Are you leaving?’

Syntax can manipulate morphology





Observation:

Many aspects of morphology can be understood as **syntactic** in nature. (For a variety of syntactic approaches to morphology, see e.g. Noyer 1992, Halle and Marantz 1993, 1994, Borer 2005, Caha 2009, Starke 2009, Embick 2010…)

Possibility:

Maybe (much of) morphology is just syntax.

Puzzle:

In what ways is morphology <u>not</u> **just syntax**, and how/why?

(A puzzle for another day…)

back to the big picture

The generative perspective

There is order in the chaos. It is possible (and desirable!) to build a constrained model of natural language morphology.

Many choice points along the way / many paths through the chaos!

- I've offered one set of answers to some of the big questions:
  - Are morphemes the basic unit of analysis in morphology?
    YES. The morphology operates over pieces.
  - Is morphology special, operating in ways totally distinct from other areas of the grammar?
    NO. Morphology starts with syntax.
- Other generative theories give different answers!
  (see, e.g., Aronoff 1976, Wunderlich 1996, Stump 2001, 2016; see also Kalin & Weisser To appear)

Typology + theory

There is a beautiful relationship between typological investigations and morphological theory, e.g.:

- Affix order (e.g., Julien 2002, Cinque 2014)
- Bobaljik's (2012) *ABA and subsequent literature (e.g., Smith et al 2019, Middleton 2020, i.a.)
- Portmanteau formation (e.g., Radkevich 2010, Banerjee 2021)
- Infixation (e.g., Yu 2007, Kalin 2022a)
- Gender morphology (e.g., Kramer 2015)
- Phi features (e.g., Harley & Ritter 2002, Harbour 2016, 2020)

There's **a lot** more to say and do!

A non-exhaustive list of other things I could have talked about:

- **Phenomena**
  - Morphology-syntax mismatches
  - Syncretism
  - Root-and-template morphology
  - Truncation
  - Multiple exponence
- **Theory**
  - Incremental vs. realizational
  - The post-syntax
  - Derivational ordering
  - Cartography

thank you!

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