

# Morphology I

Andrew Murphy  
andrew.murphy@uchicago.edu

Week 4

04.20.22

LING 20001: Introduction to Linguistics

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
- So far, we have just talked about the properties and arrangement of sounds in words.

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
- So far, we have just talked about the properties and arrangement of sounds in words.
- Sounds are arranged into words, which are associated with meanings:

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
  - So far, we have just talked about the properties and arrangement of sounds in words.
  - Sounds are arranged into words, which are associated with meanings:
- 
- /t/, /k/, /æ/

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
  - So far, we have just talked about the properties and arrangement of sounds in words.
  - Sounds are arranged into words, which are associated with meanings:
- 
- /t/, /k/, /æ/

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
  - So far, we have just talked about the properties and arrangement of sounds in words.
  - Sounds are arranged into words, which are associated with meanings:
- 
- /t/, /k/, /æ/ → [kæt]

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
  - So far, we have just talked about the properties and arrangement of sounds in words.
  - Sounds are arranged into words, which are associated with meanings:
- 
- /t/, /k/, /æ/ → [kæt] = 'cat'

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
- So far, we have just talked about the properties and arrangement of sounds in words.
- Sounds are arranged into words, which are associated with meanings:

- /t/, /k/, /æ/ → [kæt] = 'cat' =



# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
- So far, we have just talked about the properties and arrangement of sounds in words.
- Sounds are arranged into words, which are associated with meanings:

- /t/, /k/, /æ/ → [kæt] = 'cat' =



- However, we have already seen that some words are complex, e.g. [kɔtɨ] in Polish is [kɔt] 'cat' + [-ɨ] '-s'.

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
- So far, we have just talked about the properties and arrangement of sounds in words.
- Sounds are arranged into words, which are associated with meanings:

- /t/, /k/, /æ/ → [kæt] = 'cat' =



- However, we have already seen that some words are complex, e.g. [kɔtɨ] in Polish is [kɔt] 'cat' + [-ɨ] '-s'.

# What is a word?

- Last week, we talked about sounds (**phonetics/phonology**)
- So far, we have just talked about the properties and arrangement of sounds in words.
- Sounds are arranged into words, which are associated with meanings:

• /t/, /k/, /æ/ → [kæt] = 'cat' =



- However, we have already seen that some words are complex, e.g. [kɔtɨ] in Polish is [kɔt] 'cat' + [-ɨ] '-s'.
- The study of the structure and form of words is known as **morphology**.

# Morphemes

- The basic unit of morphology is the **morpheme**:

# Morphemes

- The basic unit of morphology is the **morpheme**:

## Morpheme

The smallest meaningful or functional unit in language

# Morphemes

- The basic unit of morphology is the **morpheme**:

## Morpheme

The smallest meaningful or functional unit in language

- A crucial first step in morphological analysis is the **segmentation** of words into morphemes:

# Morphemes

- The basic unit of morphology is the **morpheme**:

## Morpheme

The smallest meaningful or functional unit in language

- A crucial first step in morphological analysis is the **segmentation** of words into morphemes:

fighters  
/faɪtə.ɪz/

## Morphemes:

# Morphemes

- The basic unit of morphology is the **morpheme**:

## Morpheme

The smallest meaningful or functional unit in language

- A crucial first step in morphological analysis is the **segmentation** of words into morphemes:

**fight**-ers  
/faɪt-əɪz/

### Morphemes:

fight            /faɪt/    'engage in violent activity'

# Morphemes

- The basic unit of morphology is the **morpheme**:

## Morpheme

The smallest meaningful or functional unit in language

- A crucial first step in morphological analysis is the **segmentation** of words into morphemes:

fight-er-s  
/faɪt-əɪ-z/

### Morphemes:

fight	/faɪt/	'engage in violent activity'
-er	/-əɪ/	'someone/something that carries out an action'

# Morphemes

- The basic unit of morphology is the **morpheme**:

## Morpheme

The smallest meaningful or functional unit in language

- A crucial first step in morphological analysis is the **segmentation** of words into morphemes:

fight-er-s  
/faɪt-əɪ-z/

### Morphemes:

fight	/faɪt/	'engage in violent activity'
-er	/-əɪ/	'someone/something that carries out an action'
-s	/-z/	'more than one'

# Morphemes

- The basic unit of morphology is the **morpheme**:

## Morpheme

The smallest meaningful or functional unit in language

- A crucial first step in morphological analysis is the **segmentation** of words into morphemes:

fight-er-s  
/faɪt-əɪ-z/

### Morphemes:

fight	/faɪt/	'engage in violent activity'
-er	/-əɪ/	'someone/something that carries out an action'
-s	/-z/	'more than one'

- There is no meaningful unit /f/, /aɪt/ or /rɪz/ → not morphemes of English

# Free vs. bound morphemes

- What is the difference between morphemes like *fight* and *-er*?

# Free vs. bound morphemes

- What is the difference between morphemes like *fight* and *-er*?
- *fight* is a **free morpheme**. It can occur on its own and is not dependent on the presence of another morpheme.

# Free vs. bound morphemes

- What is the difference between morphemes like *fight* and *-er*?
- *fight* is a **free morpheme**. It can occur on its own and is not dependent on the presence of another morpheme.
- *-er* is a **bound morpheme**. It cannot occur on its own. It requires the presence of another morpheme.

cat	-s	cats
de-	construct	deconstruct
investigate	-ion	investigation
cran-	berry	cranberry

# Identifying morphemes: Farsi

How would we analyze Farsi?

# Identifying morphemes: Farsi

How would we analyze Farsi?

<i>xaridam</i>	'I bought'
<i>xaridi</i>	'you (sg.) bought'
<i>xarid</i>	'he bought'
<i>naxaridam</i>	'I did not buy'
<i>mixarid</i>	'he was buying'
<i>mixaridid</i>	'you (pl.) were buying'

# Identifying morphemes: Farsi

How would we analyze Farsi?

<i>xaridam</i>	'I bought'
<i>xaridi</i>	'you (sg.) bought'
<i>xarid</i>	'he bought'
<i>naxaridam</i>	'I did not buy'
<i>mixarid</i>	'he was buying'
<i>mixaridid</i>	'you (pl.) were buying'

- The first step is to segment the word based on what they have in common (the root)

# Identifying morphemes: Farsi

How would we analyze Farsi?

<i>xaridam</i>	'I bought'
<i>xaridi</i>	'you (sg.) bought'
<i>xarid</i>	'he bought'
<i>naxaridam</i>	'I did not buy'
<i>mixarid</i>	'he was buying'
<i>mixaridid</i>	'you (pl.) were buying'

- The first step is to segment the word based on what they have in common (the root)
- Imagine that we already know that *xar* means 'buy' (based on comparison with other forms).

# Identifying morphemes: Farsi

How would we analyze Farsi?

<i>xar-idam</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-idi</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-idam</i>	'I did not buy'
<i>mi-xar-idid</i>	'you (pl.) were buying'

- The first step is to segment the word based on what they have in common (the root)
- Imagine that we already know that *xar* means 'buy' (based on comparison with other forms).

# Identifying morphemes: Farsi

How would we analyze Farsi?

<i>xar-idam</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-idi</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-idam</i>	'I did not buy'
<i>mi-xar-idid</i>	'you (pl.) were buying'

- The first step is to segment the word based on what they have in common (the root)
- Imagine that we already know that *xar* means 'buy' (based on comparison with other forms).
- What do all of these forms have in common (based on the translations)?

# Identifying morphemes: Farsi

How would we analyze Farsi?

<i>xar-idam</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-idi</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-idam</i>	'I did not buy'
<i>mi-xar-idid</i>	'you (pl.) were buying'

- The first step is to segment the word based on what they have in common (the root)
- Imagine that we already know that *xar* means 'buy' (based on comparison with other forms).
- What do all of these forms have in common (based on the translations)?

**Past tense**

# Identifying morphemes: Farsi

How would we analyze Farsi?

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

- The first step is to segment the word based on what they have in common (the root)
- Imagine that we already know that *xar* means 'buy' (based on comparison with other forms).
- What do all of these forms have in common (based on the translations)?

**Past tense**

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

Let's identify the other morphemes:

buy	<i>xar</i>
Past tense	<i>-id</i>
I	
you (sg.)	
you (pl.)	
not	
he	
was/were ... ing	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

Let's identify the other morphemes:

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	
you (pl.)	
not	
he	
was/were ... ing	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

Let's identify the other morphemes:

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	
not	
he	
was/were ... ing	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

Let's identify the other morphemes:

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	
he	
was/were ... ing	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

Let's identify the other morphemes:

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	
was/were ... ing	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

Let's identify the other morphemes:

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

Let's identify the other morphemes:

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	<i>mi-</i>

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	<i>mi-</i>

How would we say the following in Farsi?

I was buying.

You (sg.) did not buy.

You (sg.) were buying.

You (sg.) were not buying

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	<i>mi-</i>

How would we say the following in Farsi?

I was buying. *mixaridam*

You (sg.) did not buy.

You (sg.) were buying.

You (sg.) were not buying

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	<i>mi-</i>

How would we say the following in Farsi?

I was buying.	<i>mixaridam</i>
You (sg.) did not buy.	<i>naxaridi</i>
You (sg.) were buying.	
You (sg.) were not buying	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	<i>mi-</i>

How would we say the following in Farsi?

I was buying.	<i>mixaridam</i>
You (sg.) did not buy.	<i>naxaridi</i>
You (sg.) were buying.	<i>mixaridi</i>
You (sg.) were not buying	

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	<i>mi-</i>

How would we say the following in Farsi?

I was buying.	<i>mixaridam</i>
You (sg.) did not buy.	<i>naxaridi</i>
You (sg.) were buying.	<i>mixaridi</i>
You (sg.) were not buying	<i>minaxaridi?</i>

# Identifying morphemes: Farsi

<i>xar-id-am</i>	'I bought'
<i>mi-xar-id</i>	'he was buying'
<i>xar-id-i</i>	'you (sg.) bought'
<i>xar-id</i>	'he bought'
<i>na-xar-id-am</i>	'I did not buy'
<i>mi-xar-id-id</i>	'you (pl.) were buying'

buy	<i>xar</i>
Past tense	<i>-id</i>
I	<i>-am</i>
you (sg.)	<i>-i</i>
you (pl.)	<i>-id</i>
not	<i>na-</i>
he	<i>-∅</i>
was/were ... ing	<i>mi-</i>

How would we say the following in Farsi?

I was buying.	<i>mixaridam</i>
You (sg.) did not buy.	<i>naxaridi</i>
You (sg.) were buying.	<i>mixaridi</i>
You (sg.) were not buying	<i>minaxaridi? namixaridi?</i>

## Root

A morpheme which determines the basic meaning of the larger word.

## Root

A morpheme which determines the basic meaning of the larger word.

## Affix

A morpheme which concatenates with a root to alter its meaning or function in a predictable way

## Root

A morpheme which determines the basic meaning of the larger word.

## Affix

A morpheme which concatenates with a root to alter its meaning or function in a predictable way

	<b>root</b>	<b>affix</b>
cats	cat	-s
talked	talk	-ed
unreal	real	un-
government	govern	-ment

- In many languages, root=free morpheme and affix=bound morpheme.

# Roots & affixes

- In many languages, root=free morpheme and affix=bound morpheme.
- But this is not always the case...

# Roots & affixes

- In many languages, root=free morpheme and affix=bound morpheme.
- But this is not always the case...
- Bound roots: *kempt* in *un-kempt*

- In many languages, root=free morpheme and affix=bound morpheme.
- But this is not always the case...
- Bound roots: *kempt* in *un-kempt*
- In other languages too, e.g. body parts are bound roots in Slave:

*/fi/	'head'	/se-fi/	'my head'
*/be/	'belly'	/ne-be/	'my belly'
*/dze/	'heart'	/ʔe-dze/	'someone's heart'

- In many languages, root=free morpheme and affix=bound morpheme.
- But this is not always the case...
- Bound roots: *kempt* in *un-kempt*
- In other languages too, e.g. body parts are bound roots in Slave:

*/fi/	'head'	/se-fi/	'my head'
*/be/	'belly'	/ne-be/	'my belly'
*/dze/	'heart'	/ʔe-dze/	'someone's heart'

- Most words consist of a single **root**.

- In many languages, root=free morpheme and affix=bound morpheme.
- But this is not always the case...
- Bound roots: *kempt* in *un-kempt*
- In other languages too, e.g. body parts are bound roots in Slave:

*/fi/	'head'	/se-fi/	'my head'
*/be/	'belly'	/ne-be/	'my belly'
*/dze/	'heart'	/ʔe-dze/	'someone's heart'

- Most words consist of a single **root**.
- However, we have **compounds** in English like *fire-hose* or *sun-flower* (combination of two roots/lexemes).

- Affixes can be divided into:
  - ★ **Prefixes:** An affix that precedes the root
  - ★ **Suffixes:** An affix that follows the root

- Affixes can be divided into:
  - ★ **Prefixes:** An affix that precedes the root
  - ★ **Suffixes:** An affix that follows the root

<b>prefixes</b>	<b>suffixes</b>
<i>sub-standard</i>	<i>faith-ful</i>
<i>re-play</i>	<i>harass-ment</i>
<i>il-legal</i>	<i>hunt-er</i>
<i>in-accurate</i>	<i>kind-ness</i>

- Affixes can be divided into:
  - ★ **Prefixes:** An affix that precedes the root
  - ★ **Suffixes:** An affix that follows the root

<b>prefixes</b>	<b>suffixes</b>
<i>sub-standard</i>	<i>faith-ful</i>
<i>re-play</i>	<i>harass-ment</i>
<i>il-legal</i>	<i>hunt-er</i>
<i>in-accurate</i>	<i>kind-ness</i>

However, things are not always that simple...

How is the past participle formed in German?

How is the past participle formed in German?

hassen	'to hate'	gehasst	'hated'
fragen	'to ask'	gefragt	'asked'
loben	'to praise'	gelobt	'praised'
zeigen	'to show'	gezeigt	'shown'

How is the past participle formed in German?

hassen	'to hate'	gehasst	'hated'
fragen	'to ask'	gefragt	'asked'
loben	'to praise'	gelobt	'praised'
zeigen	'to show'	gezeigt	'shown'

How is the past participle formed in German?

hass-en	'to hate'	<b>ge-hass-t</b>	'hated'
frag-en	'to ask'	<b>ge-frag-t</b>	'asked'
lob-en	'to praise'	<b>ge-lob-t</b>	'praised'
zeig-en	'to show'	<b>ge-zeig-t</b>	'shown'

How is the past participle formed in German?

hass-en	'to hate'	<b>ge-hass-t</b>	'hated'
frag-en	'to ask'	<b>ge-frag-t</b>	'asked'
lob-en	'to praise'	<b>ge-lob-t</b>	'praised'
zeig-en	'to show'	<b>ge-zeig-t</b>	'shown'

- The suffix *-en* marks the infinitive 'to' form.

How is the past participle formed in German?

hass-en	'to hate'	<b>ge-hass-t</b>	'hated'
frag-en	'to ask'	<b>ge-frag-t</b>	'asked'
lob-en	'to praise'	<b>ge-lob-t</b>	'praised'
zeig-en	'to show'	<b>ge-zeig-t</b>	'shown'

- The suffix *-en* marks the infinitive 'to' form.
- The **circumfix** *ge- -t* attaches to either side of the root (combination of prefix and suffix).

How is past tense marked in Tagalog?

How is past tense marked in Tagalog?

bili	'buy'	binili	'bought'
basa	'read'	binasa	'read'
sulat	'write'	sinulat	'wrote'

How is past tense marked in Tagalog?

bili	'buy'	b-in-ili	'bought'
basa	'read'	b-in-asa	'read'
sulat	'write'	s-in-ulat	'wrote'

How is past tense marked in Tagalog?

bili	'buy'	b-in-ili	'bought'
basa	'read'	b-in-asa	'read'
sulat	'write'	s-in-ulat	'wrote'

What is the affix that turns a verb into a noun in Khmer?

How is past tense marked in Tagalog?

bili	'buy'	b-in-ili	'bought'
basa	'read'	b-in-asa	'read'
sulat	'write'	s-in-ulat	'wrote'

What is the affix that turns a verb into a noun in Khmer?

[de:k]	'to sleep'	[dɔmne:k]	'sleep'
[kat]	'to cut'	[kɔmnat]	'piece cut off'
[suo]	'to ask'	[sɔmnuo]	'question'

How is past tense marked in Tagalog?

bili	'buy'	b-in-ili	'bought'
basa	'read'	b-in-asa	'read'
sulat	'write'	s-in-ulat	'wrote'

What is the affix that turns a verb into a noun in Khmer?

[de:k]	'to sleep'	[d-ɔmn-e:k]	'sleep'
[kat]	'to cut'	[k-ɔmn-at]	'piece cut off'
[suo]	'to ask'	[s-ɔmn-uo]	'question'

How is past tense marked in Tagalog?

bili	'buy'	b-in-ili	'bought'
basa	'read'	b-in-asa	'read'
sulat	'write'	s-in-ulat	'wrote'

What is the affix that turns a verb into a noun in Khmer?

[de:k]	'to sleep'	[d-ɔmn-e:k]	'sleep'
[kat]	'to cut'	[k-ɔmn-at]	'piece cut off'
[suo]	'to ask'	[s-ɔmn-uo]	'question'

Both of these involve **infixes** that attach inside a root.

Are there infixes in English?

Are there infixes in English? Abso-frickin-lutely!

Are there infixes in English? Abso-frickin-lutely!

together	to- <b>frickin'</b> -gether
enough	e- <b>frickin'</b> -nough
Alabama	Ala- <b>frickin'</b> -bama
absolutely	abso- <b>frickin'</b> -lutely
fantastic	fan- <b>frickin'</b> -tastic
unbelievable	unbe- <b>frickin'</b> -lievable

Are there infixes in English? Abso-frickin-lutely!

together	to- <b>frickin'</b> -gether
enough	e- <b>frickin'</b> -nough
Alabama	Ala- <b>frickin'</b> -bama
absolutely	abso- <b>frickin'</b> -lutely
fantastic	fan- <b>frickin'</b> -tastic
unbelievable	unbe- <b>frickin'</b> -lievable

What the rule that determiners where the infix goes?

Are there infixes in English? Abso-frickin-lutely!

together	to- <b>frickin'</b> -gether
enough	e- <b>frickin'</b> -nough
Alabama	Ala- <b>frickin'</b> -bama
absolutely	abso- <b>frickin'</b> -lutely
fantastic	fan- <b>frickin'</b> -tastic
unbelievable	unbe- <b>frickin'</b> -lievable

What the rule that determiners where the infix goes? **Stress!**

# Reduplication

Identify the plural morpheme in Ilokano:

Identify the plural morpheme in Ilokano:

[kaldin]	'goat'	[kalkaldin]	'goats'
[pusa]	'cat'	[puspusa]	'cats'
[klase]	'class'	[klasklase]	'classes'
[jojo]	'yo-yo'	[jojjojo]	'yo-yos'

Identify the plural morpheme in Ilokano:

[kaldin]	'goat'	[kalkaldin]	'goats'
[pusa]	'cat'	[puspusa]	'cats'
[klase]	'class'	[klasklase]	'classes'
[jojo]	'yo-yo'	[jojjojo]	'yo-yos'

- There is no invariant plural morpheme, but there is a pattern.

Identify the plural morpheme in Ilokano:

[kaldin]	'goat'	[ <b>kal</b> -kaldin]	'goats'
[pusa]	'cat'	[ <b>pus</b> -pusa]	'cats'
[klase]	'class'	[ <b>klas</b> -klase]	'classes'
[jojo]	'yo-yo'	[ <b>joj</b> -jojo]	'yo-yos'

- There is no invariant plural morpheme, but there is a pattern.

# Reduplication

Identify the plural morpheme in Ilokano:

[kaldin]	'goat'	[ <b>kal</b> -kaldin]	'goats'
[pusa]	'cat'	[ <b>pus</b> -pusa]	'cats'
[klase]	'class'	[ <b>klas</b> -klase]	'classes'
[jojo]	'yo-yo'	[ <b>joj</b> -jojo]	'yo-yos'

- There is no invariant plural morpheme, but there is a pattern.
- The form of the affix involves 'copying' part of the root. This is called **reduplication**.

# Reduplication

Identify the plural morpheme in Ilokano:

[kaldin]	'goat'	[ <b>kal</b> -kaldin]	'goats'
[pusa]	'cat'	[ <b>pus</b> -pusa]	'cats'
[klase]	'class'	[ <b>klas</b> -klase]	'classes'
[jojjo]	'yo-yo'	[ <b>joj</b> -jojjo]	'yo-yos'

- There is no invariant plural morpheme, but there is a pattern.
- The form of the affix involves 'copying' part of the root. This is called **reduplication**.
- What exactly is copied?

# Reduplication

Identify the plural morpheme in Ilokano:

[kaldin]	'goat'	[ <b>kal</b> -kaldin]	'goats'
[pusa]	'cat'	[ <b>pus</b> -pusa]	'cats'
[klase]	'class'	[ <b>klas</b> -klase]	'classes'
[jojo]	'yo-yo'	[ <b>joj</b> -jojo]	'yo-yos'

- There is no invariant plural morpheme, but there is a pattern.
- The form of the affix involves 'copying' part of the root. This is called **reduplication**.
- What exactly is copied? The first CVC (consonant-verb-consonant) sequence of the root.

# Non-concatenative morphology

What is the right segmentation in Arabic?

katab	'wrote'
kattab	'caused to write'
kaatab	'corresponded'
kutib	'was written'

# Non-concatenative morphology

What is the right segmentation in Arabic?

katab	'wrote'
kattab	'caused to write'
kaatab	'corresponded'
kutib	'was written'

- What is the root 'write'?

# Non-concatenative morphology

What is the right segmentation in Arabic?

<b>k-a-t-a-b</b>	'wrote'
<b>k-a-tt-a-b</b>	'caused to write'
<b>k-aa-t-a-b</b>	'corresponded'
<b>k-u-t-i-b</b>	'was written'

- What is the root 'write'? **ktb**

# Non-concatenative morphology

What is the right segmentation in Arabic?

<b>k-a-t-a-b</b>	'wrote'
<b>k-a-tt-a-b</b>	'caused to write'
<b>k-aa-t-a-b</b>	'corresponded'
<b>k-u-t-i-b</b>	'was written'

- What is the root 'write'? **ktb**
- What about the other morphemes?

# Non-concatenative morphology

What is the right segmentation in Arabic?

<b>k-a-t-a-b</b>	'wrote'
<b>k-a-tt-a-b</b>	'caused to write'
<b>k-aa-t-a-b</b>	'corresponded'
<b>k-u-t-i-b</b>	'was written'

- What is the root 'write'? **ktb**
- What about the other morphemes?

CaCaC      past tense  
              'cause to V' (causative)  
              'V to each other' (reciprocal)  
              'was Ved' (perfective passive)

# Non-concatenative morphology

What is the right segmentation in Arabic?

<b>k-a-t-a-b</b>	'wrote'
<b>k-a-tt-a-b</b>	'caused to write'
<b>k-aa-t-a-b</b>	'corresponded'
<b>k-u-t-i-b</b>	'was written'

- What is the root 'write'? **ktb**
- What about the other morphemes?

CaCaC	past tense
CaCCaC	'cause to V' (causative)
	'V to each other' (reciprocal)
	'was Ved' (perfective passive)

# Non-concatenative morphology

What is the right segmentation in Arabic?

<b>k-a-t-a-b</b>	'wrote'
<b>k-a-tt-a-b</b>	'caused to write'
<b>k-aa-t-a-b</b>	'corresponded'
<b>k-u-t-i-b</b>	'was written'

- What is the root 'write'? **ktb**
- What about the other morphemes?

CaCaC	past tense
CaCCaC	'cause to V' (causative)
CaaCaC	'V to each other' (reciprocal)
	'was Ved' (perfective passive)

# Non-concatenative morphology

What is the right segmentation in Arabic?

<b>k-a-t-a-b</b>	'wrote'
<b>k-a-tt-a-b</b>	'caused to write'
<b>k-aa-t-a-b</b>	'corresponded'
<b>k-u-t-i-b</b>	'was written'

- What is the root 'write'? **ktb**
- What about the other morphemes?

CaCaC	past tense
CaCCaC	'cause to V' (causative)
CaaCaC	'V to each other' (reciprocal)
CuCiC	'was Ved' (perfective passive)

# Non-concatenative morphology

What is the right segmentation in Arabic?

<b>k-a-t-a-b</b>	'wrote'
<b>k-a-tt-a-b</b>	'caused to write'
<b>k-aa-t-a-b</b>	'corresponded'
<b>k-u-t-i-b</b>	'was written'

- What is the root 'write'? **ktb**
- What about the other morphemes?

CaCaC	past tense
CaCCaC	'cause to V' (causative)
CaaCaC	'V to each other' (reciprocal)
CuCiC	'was Ved' (perfective passive)

- This is an example of **templatic morphology** (also known as **root and pattern morphology**)

# Non-concatenative morphology

Some English verbs also involve **non-concatenative morphology**:

# Non-concatenative morphology

Some English verbs also involve **non-concatenative morphology**:

root	past	participle
walk	walked	walked
sing	sang	sung
give	gave	given

# Non-concatenative morphology

Some English verbs also involve **non-concatenative morphology**:

root	past	participle
walk	walked	walked
sing	sang	sung
give	gave	given

What about present progressive in Dinka?

/bok/	'to throw'
[bək]	'you (pl.) are throwing'
[bɔ:k]	'I am throwing'
[bo:k]	'He is throwing'
[bok]	'You are throwing'

# Non-concatenative morphology

Some English verbs also involve **non-concatenative morphology**:

root	past	participle
walk	walked	walked
sing	sang	sung
give	gave	given

What about present progressive in Dinka?

/bok/	'to throw'	
[bək]	'you (pl.) are throwing'	lowering
[bɔ:k]	'I am throwing'	
[bo:k]	'He is throwing'	
[bok]	'You are throwing'	

# Non-concatenative morphology

Some English verbs also involve **non-concatenative morphology**:

root	past	participle
walk	walked	walked
sing	sang	sung
give	gave	given

What about present progressive in Dinka?

/bɔk/	'to throw'
[bɔk]	'you (pl.) are throwing'
[bɔ:k]	'I am throwing'
[bo:k]	'He is throwing'
[bɔk]	'You are throwing'

lowering

lowering and lengthening

# Non-concatenative morphology

Some English verbs also involve **non-concatenative morphology**:

root	past	participle
walk	walked	walked
sing	sang	sung
give	gave	given

What about present progressive in Dinka?

/bok/	'to throw'
[bək]	'you (pl.) are throwing'
[bɔ:k]	'I am throwing'
[bo:k]	'He is throwing'
[bok]	'You are throwing'

lowering  
lowering and lengthening  
lengthening

# Non-concatenative morphology

Some English verbs also involve **non-concatenative morphology**:

root	past	participle
walk	walked	walked
sing	sang	sung
give	gave	given

What about present progressive in Dinka?

/bok/	'to throw'
[bək]	'you (pl.) are throwing'
[bɔ:k]	'I am throwing'
[bo:k]	'He is throwing'
[bok]	'You are throwing'

lowering  
lowering and lengthening  
lengthening  
nothing

What is the plural morpheme in German?

# Non-concatenative morphology

What is the plural morpheme in German?

<i>Mutter</i>	'mothers'	<i>Mütter</i>	'mothers'
<i>Vater</i>	'father'	<i>Väter</i>	'fathers'
<i>Feld</i>	'field'	<i>Felder</i>	'fields'
<i>Geld</i>	'money'	<i>Gelder</i>	'monies'
<i>Bad</i>	'bath'	<i>Bäder</i>	'baths'
<i>Gut</i>	'commodity'	<i>Güter</i>	'commodities'

# Non-concatenative morphology

What is the plural morpheme in German?

<i>Mutter</i>	'mothers'	<i>Mütter</i>	'mothers'
<i>Vater</i>	'father'	<i>Väter</i>	'fathers'
<i>Feld</i>	'field'	<i>Felder</i>	'fields'
<i>Geld</i>	'money'	<i>Gelder</i>	'monies'
<i>Bad</i>	'bath'	<i>Bäder</i>	'baths'
<i>Gut</i>	'commodity'	<i>Güter</i>	'commodities'

The plural for bath involves two kinds of plural marking (¨ and -er)!

# Allomorphy

- The form of a morpheme is not always consistent across contexts:

*a carrot      an orange*  
*a banana     an apple*

# Allomorphy

- The form of a morpheme is not always consistent across contexts:

<i>a carrot</i>	<i>an orange</i>
<i>a banana</i>	<i>an apple</i>

- The form of the indefinite article depends on its context (whether it precedes a vowel).

# Allomorphy

- The form of a morpheme is not always consistent across contexts:

<i>a carrot</i>	<i>an orange</i>
<i>a banana</i>	<i>an apple</i>

- The form of the indefinite article depends on its context (whether it precedes a vowel).
- Thus, we say that this morpheme has two **allomorphs** (surface realizations).

# Allomorphy

- The form of a morpheme is not always consistent across contexts:

<i>a carrot</i>	<i>an orange</i>
<i>a banana</i>	<i>an apple</i>

- The form of the indefinite article depends on its context (whether it precedes a vowel).
- Thus, we say that this morpheme has two **allomorphs** (surface realizations).
- Since this depends on the phonological context, we call it **phonologically-conditioned allomorphy**

# Allomorphy

- The form of a morpheme is not always consistent across contexts:

<i>a carrot</i>	<i>an orange</i>
<i>a banana</i>	<i>an apple</i>

- The form of the indefinite article depends on its context (whether it precedes a vowel).
- Thus, we say that this morpheme has two **allomorphs** (surface realizations).
- Since this depends on the phonological context, we call it **phonologically-conditioned allomorphy**
- Can we derive this with rules? (Think about Lardil from last class)

# Allomorphy

- The form of a morpheme is not always consistent across contexts:

<i>a carrot</i>	<i>an orange</i>
<i>a banana</i>	<i>an apple</i>

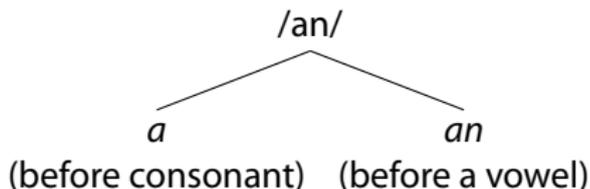
- The form of the indefinite article depends on its context (whether it precedes a vowel).
- Thus, we say that this morpheme has two **allomorphs** (surface realizations).
- Since this depends on the phonological context, we call it **phonologically-conditioned allomorphy**
- Can we derive this with rules? (Think about Lardil from last class)

# Allomorphy

- The form of a morpheme is not always consistent across contexts:

<i>a carrot</i>	<i>an orange</i>
<i>a banana</i>	<i>an apple</i>

- The form of the indefinite article depends on its context (whether it precedes a vowel).
- Thus, we say that this morpheme has two **allomorphs** (surface realizations).
- Since this depends on the phonological context, we call it **phonologically-conditioned allomorphy**
- Can we derive this with rules? (Think about Lardil from last class)



What determines allomorphy of the accusative suffix in Korean?

# Allomorphy

What determines allomorphy of the accusative suffix in Korean?

<i>ton</i>	'money'	<i>ton-ul</i>	'money'	(accusative)
<i>chayk</i>	'book'	<i>chayk-ul</i>	'book'	(accusative)
<i>tali</i>	'leg'	<i>tali-lul</i>	'leg'	(accusative)
<i>sakwa</i>	'apple'	<i>sakwa-lul</i>	'apple'	(accusative)

What determines allomorphy of the accusative suffix in Korean?

<i>ton</i>	'money'	<i>ton-ul</i>	'money'	(accusative)
<i>chayk</i>	'book'	<i>chayk-ul</i>	'book'	(accusative)
<i>tali</i>	'leg'	<i>tali-lul</i>	'leg'	(accusative)
<i>sakwa</i>	'apple'	<i>sakwa-lul</i>	'apple'	(accusative)

**Phonologically-conditioned:** *-ul* after consonant, *-lul* after a vowel

# Allomorphy

What determines allomorphy of the accusative suffix in Korean?

<i>ton</i>	'money'	<i>ton-ul</i>	'money'	(accusative)
<i>chayk</i>	'book'	<i>chayk-ul</i>	'book'	(accusative)
<i>tali</i>	'leg'	<i>tali-lul</i>	'leg'	(accusative)
<i>sakwa</i>	'apple'	<i>sakwa-lul</i>	'apple'	(accusative)

**Phonologically-conditioned:** *-ul* after consonant, *-lul* after a vowel

What about the form of conjunction 'and'?

<i>pata-wa hanul</i>	'sea and sky'	<i>hanul-kwa pata</i>	'sky and sea'
<i>say-wa cimsung</i>	'bird and animal'	<i>cimsung-kwa say</i>	'animal and bird'

# Allomorphy

What determines allomorphy of the accusative suffix in Korean?

<i>ton</i>	'money'	<i>ton-ul</i>	'money'	(accusative)
<i>chayk</i>	'book'	<i>chayk-ul</i>	'book'	(accusative)
<i>tali</i>	'leg'	<i>tali-lul</i>	'leg'	(accusative)
<i>sakwa</i>	'apple'	<i>sakwa-lul</i>	'apple'	(accusative)

**Phonologically-conditioned:** *-ul* after consonant, *-lul* after a vowel

What about the form of conjunction 'and'?

<i>pata-wa hanul</i>	'sea and sky'	<i>hanul-kwa pata</i>	'sky and sea'
<i>say-wa cimsung</i>	'bird and animal'	<i>cimsung-kwa say</i>	'animal and bird'

**Phonologically-conditioned:** *-kwa* after a consonant, *-wa* after a vowel

What determines allomorphy of the accusative suffix in Korean?

<i>ton</i>	'money'	<i>ton-ul</i>	'money'	(accusative)
<i>chayk</i>	'book'	<i>chayk-ul</i>	'book'	(accusative)
<i>tali</i>	'leg'	<i>tali-lul</i>	'leg'	(accusative)
<i>sakwa</i>	'apple'	<i>sakwa-lul</i>	'apple'	(accusative)

**Phonologically-conditioned:** *-ul* after consonant, *-lul* after a vowel

What about the form of conjunction 'and'?

<i>pata-wa hanul</i>	'sea and sky'	<i>hanul-kwa pata</i>	'sky and sea'
<i>say-wa cimsung</i>	'bird and animal'	<i>cimsung-kwa say</i>	'animal and bird'

**Phonologically-conditioned:** *-kwa* after a consonant, *-wa* after a vowel

Can we derive both kinds of allomorphy with phonological rules?

smart

smarter

smartest

---

smart

smart-er

smart-est

---

smart	smart-er	smart-est
good	better	best

---

smart	smart-er	smart-est
good	bett-er	be-st

---

smart	smart-er	smart-est	
good	bett-er	be-st	
mlady	mladší	nejmladší	(Czech)
'young'	'younger'	'youngest'	

smart	smart-er	smart-est	
good	bett-er	be-st	
<hr/>			
mlad-y	mlad-ší	nej-mlad-ší	(Czech)
'young'	'younger'	'youngest'	

smart	smart-er	smart-est	
good	bett-er	be-st	
mlad-y	mlad-ší	nej-mlad-ší	(Czech)
'young'	'younger'	'youngest'	
špatny	horší	nejhorší	
'bad'	'worse'	'worst'	

smart	smart-er	smart-est	
good	bett-er	be-st	
mlad-y	mlad-ší	nej-mlad-ší	(Czech)
'young'	'younger'	'youngest'	
špatn-y	hor-ší	nej-hor-ší	
'bad'	'worse'	'worst'	

smart	smart-er	smart-est	
good	bett-er	be-st	
mlad-y	mlad-ší	nej-mlad-ší	(Czech)
'young'	'younger'	'youngest'	
špatn-y	hor-ší	nej-hor-ší	
'bad'	'worse'	'worst'	

Is this a case of phonologically-conditioned allomorphy?

smart	smart-er	smart-est	
good	bett-er	be-st	
mlad-y	mlad-ší	nej-mlad-ší	(Czech)
'young'	'younger'	'youngest'	
špatn-y	hor-ší	nej-hor-ší	
'bad'	'worse'	'worst'	

Is this a case of phonologically-conditioned allomorphy?

No, this is **grammatically-conditioned allomorphy** – 'good' has the bound form *bett-* in the comparative and *be-* in the superlative.