Some Elements of Morphological Theory
Supplementary Readings

The following readings have been posted to the Moodle course site:

- Contemporary Linguistics: Chapter 4 (pp. 127-143)

The following reading (on Moodle) is not essential, but you might find it helpful/interesting:

- Language Instinct: Chapter 5 (119-152)
The Basics of Morphology

The Fundamental Question (for Linguists):
What are the rules and mental representations that underlie our ability to speak and understand a language?

Last Class:
Some of those rules concern the formation of words.

<table>
<thead>
<tr>
<th>Morphological Rule</th>
<th>Illustrative Word:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N → V + /ɪə/</td>
<td>player</td>
</tr>
<tr>
<td>N → A + /nɛs/</td>
<td>happiness</td>
</tr>
<tr>
<td>A → V + /əbʌl/</td>
<td>doable</td>
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<td>sickening</td>
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<tr>
<td>A → A + /ɪŋ/</td>
<td>taller</td>
</tr>
<tr>
<td>V → /ɪŋ/ + V</td>
<td>reinvest</td>
</tr>
<tr>
<td>A → /ʌŋ/ + A</td>
<td>uninteresting</td>
</tr>
<tr>
<td>V → /ʌŋ/ + V</td>
<td>unlock</td>
</tr>
</tbody>
</table>

Morphology:
The study of rules of word formation (word structure).
Going Further...

- So far, we’ve seen two kinds of morphological rule:
  - Prefixation: attaching a prefix to the beginning of a morpheme
  - Suffixation: attaching a suffix to the end of a morpheme

- These are the main types of morphological rule in English.

- However...
  - There are other types of morphological rules in the languages of the world...
Infixation

Suffix:
An affix that attaches to the *end* of a morpheme.

Prefix:
An affix that attaches to the *beginning* of a morpheme.

**Infix:**
An affix that is *inserted into* a morpheme.
Infixation in Tagalog

Consider the following pairs of words from Tagalog.

[bili] ‘buy’       [binili] ‘bought’
[basa] ‘read (pres)’ [binasa] ‘read (past)’
[sulat] ‘write’     [sinulat] ‘wrote’
Infixation in Tagalog

Consider the following pairs of words from Tagalog.

\[
\begin{array}{ccc}
\text{[bili]} & \text{‘buy’} & \text{[binili]} & \text{‘bought’} \\
\text{[basa]} & \text{‘read (pres)’} & \text{[binasa]} & \text{‘read (past)’} \\
\text{[sulat]} & \text{‘write’} & \text{[sinulat]} & \text{‘wrote’}
\end{array}
\]

Observations:

- The words on the left are verbs.
- The words on the right are verbs.
- The words on the right are just like the ones on the left, except \text{[in]} appears after the first sound.
- For each of these pairs, the verb with \text{[in]} is in the past tense.
Infixation in Tagalog

Consider the following pairs of words from Tagalog.

<table>
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<th>Right Word with [in]</th>
<th>Meaning</th>
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</thead>
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<td>binili</td>
<td>'buy'</td>
</tr>
<tr>
<td>basa</td>
<td>binasa</td>
<td>'read (present)'</td>
</tr>
<tr>
<td>sulat</td>
<td>sinulat</td>
<td>'write'</td>
</tr>
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Observations:

- The words on the left are verbs.
- The words on the right are verbs.
- The words on the right are just like the ones on the left, except [in] appears after the first sound.
- For each of these pairs, the verb with [in] is in the past tense.

Hypothesis: Tagalog morphology contains the following rule:

- “You can form a V from a V by inserting [in] after the first sound.”
Infixation in English

Consider the following pairs of words from English.

- incredible vs. in-freakin’-credible
- fantastic vs. fan-freakin’-tastic
- Massachusetts vs. Massa-freakin’-chusetts
- underestimated vs. under-freakin’-estimated

Observations:
The words on the left are adjectives, nouns, verbs.
The words on the right are also adjectives, nouns, verbs.
The words on the right are just like the ones on the left, except ‘freakin’ appears inside them.

Hypothesis:
English morphology contains the following rule:
For any word of English, you can form another word by sticking ‘freakin’ inside it.
Infixation in English

Consider the following pairs of words from English.

- incredible  in-freakin’-credible
- fantastic  fan-freakin’-tastic
- Massachusetts  Massa-freakin’-chusetts
- underestimated  under-freakin’-estimated

Observations:

- The words on the left are adjectives, nouns, verbs.
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Constraints on English Infixation

Skeptical Question:
Uhm...isn’t this just people saying ‘freakin’ while in the middle of saying something else?
Constraints on English Infixation

Skeptical Question:
Uhm...isn’t this just people saying ‘freakin’ while in the middle of saying something else?

Fun Fact:
You can’t just put ‘freakin’ anywhere inside a word of English.

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<th>Word</th>
<th>Infixation Example</th>
<th>Unacceptable Example</th>
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<tr>
<td>incredible</td>
<td>in-freakin’-credible</td>
<td>*incred-i-freakin’-ble</td>
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<tr>
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<td>fan-freakin’-tastic</td>
<td>*fantas-freakin’-tic</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>Massa-freakin’-chusetts</td>
<td>*Mass-freakin’-achusetts</td>
</tr>
<tr>
<td>underestimated</td>
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Constraints on English Infixation

Skeptical Question:
Uhm...isn’t this just people saying ‘freakin’’ while in the middle of saying something else?

Fun Fact:
Instead, it has to go just before the syllable receiving ‘main stress’

- incredible → in-freakin’-credible
- fantastic → fan-freakin’-tastic
- Massachusetts → Massa-freakin’-chusetts
- underestimated → under-freakin’-estimated

*incredifreakin’ble
*fantasfreakintic
*Massfreakinachusetts
*underesfreakintimated
Constraints on English Infixation

Skeptical Question:
Uhm...isn’t this just people saying ‘freakin’ while in the middle of saying something else?

Fun Fact:
Instead, it has to go just before the syllable receiving ‘main stress’

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Conclusions:

- The insertion of ‘freakin’ is *rule governed*.
- The rule refers to stress, and so it *is* a ‘linguistic’ rule.
Reduplication

Suffixation:
Attaching an affix to the end of a morpheme.

Prefixation:
Attaching an affix to the beginning of a morpheme.

Infixation:
Inserting an affix inside a morpheme.

Reduplication:
Copying a morpheme, or part of a morpheme.
Reduplication in Bahasa Indonesian

Consider the following pairs of words from Bahasa Indonesian.

[oraŋ] ‘man’  [oraŋ oraŋ] ‘men’
[anak] ‘child’  [anak anak] ‘children’
[maŋga] ‘mango’  [maŋga maŋga] ‘mangoes’
Reduplication in Bahasa Indonesian

Consider the following pairs of words from Bahasa Indonesian.

\[
\begin{align*}
\text{[oraŋ]} & \quad \text{‘man’} & \quad \text{[oraŋ oraŋ]} & \quad \text{‘men’} \\
\text{[anak]} & \quad \text{‘child’} & \quad \text{[anak anak]} & \quad \text{‘children’} \\
\text{[maŋga]} & \quad \text{‘mango’} & \quad \text{[maŋga maŋga]} & \quad \text{‘mangoes’}
\end{align*}
\]

Observations:

- The words on the left are nouns.
- The words on the right are nouns.
- The words on the right are doubles of the ones on the left.
- For each of these pairs, the doubled word is plural.
Reduplication in Bahasa Indonesian

Consider the following pairs of words from Bahasa Indonesian.

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\begin{align*}
\text{[oran]} & \quad \text{‘man’} & \quad \text{[oran oran]} & \quad \text{‘men’} \\
\text{[anak]} & \quad \text{‘child’} & \quad \text{[anak anak]} & \quad \text{‘children’} \\
\text{[manga]} & \quad \text{‘mango’} & \quad \text{[manga manga]} & \quad \text{‘mangoes’}
\end{align*}
\]

Observations:

- The words on the left are nouns.
- The words on the right are nouns.
- The words on the right are **doubles** of the ones on the left.
- For each of these pairs, the doubled word is plural.

Hypothesis:

Bahasa Indonesian morphology contains the following rule:

- “You can form a N by doubling another N.”
Reduplication in English

- Reduplication is an incredibly common word-formation process across languages.

- We even have it in English (to a limited extent):
  - “Is she just sort of a friend, or is she a friend friend?”
  - “I don’t want a taco salad, I want a salad salad.”
  - “She’s reading a book book, not just a ‘graphic novel’.”

- The Rule of English Reduplication:
  A noun can be reduplicated to mean ‘a true instance of the type’.
Internal Change (Ablaut)

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Attaching an affix to the \textit{end} of a morpheme.

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Inf ixation:
Inserting an affix \textit{inside} a morpheme.

Reduplication:
Copying a morpheme, or part of a morpheme.

\textbf{Internal Change (Ablaut)}:
Altering some phoneme(s) within a morpheme.
Internal Change (Ablaut) in English

Consider the following pairs of words from English.

\[
\begin{align*}
\text{[spik]} & \quad \text{‘speak’} & \quad \text{[spowk]} & \quad \text{‘spoke’} \\
\text{[\textipa{\textael}]j\textipa{\textael}]} & \quad \text{‘write’} & \quad \text{[\textipa{\textael}owt]} & \quad \text{‘wrote’} \\
\text{[t\textipa{\textael}uz]} & \quad \text{‘choose’} & \quad \text{[t\textipa{\textael}owz]} & \quad \text{‘chose’}
\end{align*}
\]
Internal Change (Ablaut) in English

Consider the following pairs of words from English.

- [spik] ‘speak’ [spowk] ‘spoke’
- [µajt] ‘write’ [rowt] ‘wrote’
- [ʧuz] ‘choose’ [ʧowz] ‘chose’

Observations:

- The verbs on the right look just like those on the left, except the vowel has changed (to [ow]).
- The verbs on the right are the past-tense versions of the verbs on the left.
Internal Change (Ablaut) in English

Consider the following pairs of words from English.

[spik] ‘speak’ [spowk] ‘spoke’
[ðajt] ‘write’ [ðowt] ‘wrote’
[tʃuz] ‘choose’ [tʃowz] ‘chose’

Observations:

- The verbs on the right look just like those on the left, except the vowel has changed (to [ow]).
- The verbs on the right are the past-tense versions of the verbs on the left.

Hypothesis: English morphology contains the following rule:

- Form past-tense of some verbs by changing the vowel to [ow].
Compounding

Suffixation:
Attaching an affix to the *end* of a morpheme.

Prefixation:
Attaching an affix to the *beginning* of a morpheme.

Infixation:
Inserting an affix *inside* a morpheme.

Reduplication:
Copying a morpheme, or part of a morpheme.

Internal Change (Ablaut):
Altering some phoneme(s) within a morpheme.

Compounding:
Forming a word by combining together two other words.

- Unlike the other processes, compounding combines two *free* morphemes.
Compounding in English

Some Compounds in English:

blackboard  (black + board)
dollhouse   (doll + house)
jumpsuit    (jump + suit)
steamroll   (steam + roll)
whitewash   (white + wash)
breakdance  (break + dance)
nationwide  (nation + wide)
blue-green  (blue + green)
Compounding in English

Some Compounds in English:

- blackboard (black + board)
- dollhouse (doll + house)
- jumpsuit (jump + suit)
- steamroll (steam + roll)
- whitewash (white + wash)
- breakdance (break + dance)
- nationwide (nation + wide)
- blue-green (blue + green)

Compounds and English Spelling:

- Sometimes compounds are written as a single word (mailman).
- Sometimes they are hyphenated (blue-green, spoon-feed).
- **Sometimes they are written as two separate words:**
  - dog house
  - fire engine
  - oil well
  - television repair specialization exam
Compounding in English

Some Compounds in English:

- blackboard (black + board)
- dollhouse (doll + house)
- jumpsuit (jump + suit)
- steamroll (steam + roll)
- whitewash (white + wash)
- breakdance (break + dance)
- nationwide (nation + wide)
- blue-green (blue + green)

Question:
What shows that things like ‘dog house’ are single, compound words?
Compounding in English

Some Compounds in English:

- blackboard (black + board)
- dollhouse (doll + house)
- jumpsuit (jump + suit)
- steamroll (steam + roll)
- whitewash (white + wash)
- breakdance (break + dance)
- nationwide (nation + wide)
- blue-green (blue + green)

Answer = Stress

- In a compound, main stress is on first word.
- In a phrase, main stress can be on last word.

- blackbird
- dog house
- fire engine
- oil well
- a black car
- an old house
- a broken engine
- an empty well
Morphological Rules for Compounding

Important Fact:
The way that compounding works reveals something interesting about prefixation and suffixation.

- To see this, we’ll begin by writing out some rules for compounding.

- In doing this, we’re going to pay careful attention to:
  - The categories of the words in the compound (noun, verb, adjective)
  - The category of the resulting compound (noun, verb, adjective)
Noun-Noun Compounds

In English, two nouns are ‘compounded’ together into a single noun.

Illustration: ‘Dollhouse’

\[ \text{N} \]

\[ \text{N} \]

\[ /\text{doll}/ \quad /\text{house}/ \]

The Rule This Suggests:

\[ N \rightarrow N + N \]

(A noun may be formed from a noun followed by another noun)
Adjective-Noun Compounds

In English, an adjective and a noun are ‘compounded’ together into a single noun.

Illustration: ‘Blackbird’

```
   N
  /\  
 A  N  
 /\  /\  
/blæk/ /bird/
```

The Rule This Suggests:

\[ N \rightarrow A + N \]

(A noun may be formed from an adjective followed by a noun)
Verb-Noun Compounds

In English, a verb and a noun are ‘compounded’ together into a single noun.

Illustration: ‘Jumpsuit’

The Rule This Suggests:

\[ N \rightarrow V + N \]

(A noun may be formed from a verb followed by a noun)
Noun-Verb Compounds

In English, a noun and a verb are ‘compounded’ together into a single verb.

Illustration: ‘Spoon-feed’

The Rule This Suggests:

\[ V \rightarrow N + V \]

(A verb may be formed from a noun followed by a verb)
Adjective-Verb Compounds

In English, an adjective and a verb are ‘compounded’ together into a single verb.

Illustration: ‘Whitewash’

\[
\text{V} \\
\text{A} \quad \text{V} \\
/\text{mAj}/ \quad /\text{ws}/
\]

The Rule This Suggests:

\[V \rightarrow A + V\]

(A verb may be formed from an adjective followed by a verb)
Verb-Verb Compounds

In English, two verbs are ‘compounded’ together into a single verb.

Illustration: ‘Breakdance’

The Rule This Suggests:

\[
V \rightarrow V + V
\]

(A verb may be formed from a verb followed by another verb)
Noun-Adjective Compounds

In English, a noun and an adjective are ‘compounded’ together into a single adjective.

Illustration: ‘Nationwide’

\[
\begin{array}{c}
& A \\
N & A \\
/\text{nejfijn}/ & /\text{wajd}/
\end{array}
\]

The Rule This Suggests:

\[A \rightarrow N + A\]

(An adjective may be formed from a noun followed by an adjective)
Adjective-Adjective Compounds

In English, two adjectives are ‘compounded’ together into a single adjective.

Illustration: ‘Blue-green’

A

A

A

A

/blu/  /gûin/

The Rule This Suggests:

A → A + A

(An adjective may be formed from an adjective followed by another adjective)
### An Emerging Pattern

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**A Crucial Observation:**  
The category of the compound is **always** the same as the category of the last word in the compound.
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```
N

A   N
/blaek/   /bird/
```
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```
N
 /\  
 V  N
 /\  
/amp/  /sut/
```
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<td>A → A + A</td>
<td>‘blue-green’</td>
</tr>
</tbody>
</table>

A Crucial Observation:
The category of the compound is always the same as the category of the last word in the compound.

\[
\begin{array}{c}
V \\
/\text{məj}/
\end{array}
\]
**An Emerging Pattern**

<table>
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<tr>
<th>Rule</th>
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<tbody>
<tr>
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</tr>
<tr>
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<td>‘jumpsuit’</td>
</tr>
<tr>
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</tr>
<tr>
<td>V → A + V</td>
<td>‘whitewash’</td>
</tr>
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<td>V → V + V</td>
<td>‘breakdance’</td>
</tr>
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<td>‘nationwide’</td>
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**A Crucial Observation:**
The category of the compound is **always** the same as the category of the last word in the compound.

```
A
 /\  /
N A
/\  /
/nejj+n/ /wajd/
```
An Emerging Pattern

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A Crucial Observation:
The category of the compound is always the same as the category of the last word in the compound.

A Characterization:
The category of the compound is ‘copied up’ from the category of the rightmost word in the compound.
Heads and Words

Vocabulary:

X is the **head** of Y if:

- X is a part of Y
- The category of Y is ‘copied up’ from the category of X

<table>
<thead>
<tr>
<th>Word</th>
<th>Head of Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>blackbird (N)</td>
<td>bird (N)</td>
</tr>
<tr>
<td>jumpsuit (N)</td>
<td>suit (N)</td>
</tr>
<tr>
<td>spoon-feed (V)</td>
<td>feed (V)</td>
</tr>
<tr>
<td>whitewash (V)</td>
<td>wash (V)</td>
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Heads and Words

Vocabulary:

X is the **head** of Y if:

- X is a part of Y
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Heads and Meaning:

Sometimes the head contributes the ‘core meaning’ of the compound.

- A ‘blackbird’ is a kind of **bird**.
- A ‘jumpsuit’ is a kind of **suit**.
- To ‘breakdance’ is to **dance**.
The Right-Hand Head Rule

In an English compound, the head is the right-most morpheme.
The Right-Hand Head Rule

The Right-Hand Head Rule

In an English compound, the head is the right-most morpheme.

- We can now get rid of all those separate ‘compounding rules’:

\[
\begin{align*}
\text{N} & \rightarrow \text{N} + \text{N} \quad \text{‘dollhouse’} \\
\text{N} & \rightarrow \text{A} + \text{N} \quad \text{‘blackbird’} \\
\text{N} & \rightarrow \text{V} + \text{N} \quad \text{‘jumpsuit’} \\
\text{V} & \rightarrow \text{N} + \text{V} \quad \text{‘spoon-feed’} \\
\text{V} & \rightarrow \text{A} + \text{V} \quad \text{‘whitewash’} \\
\text{V} & \rightarrow \text{V} + \text{V} \quad \text{‘breakdance’} \\
\text{A} & \rightarrow \text{N} + \text{A} \quad \text{‘nationwide’} \\
\text{A} & \rightarrow \text{A} + \text{A} \quad \text{‘blue-green’}
\end{align*}
\]

- ‘Right-Hand Head Rule’ makes all these rules redundant.
  - Suppose you put together a N and a V into a single word.
  - The ‘RHHR’ alone says that the word must be a V.
  - And so we don’t need a separate rule of ‘V \rightarrow \text{N} + \text{V}’
Rethinking English Morphology

Our Morphological Rules for English:

N → V + /i SqlDataAdapter
N → A + /nEs/ happiness
A → V + /əbl/ doable
A → V + /iŋ/ sickening
A → A + /iAda/ taller
V → /iDataAdapter + V reinvest
A → /ən/ + A uninteresting
V → /ən/ + V unlock
Rethinking English Morphology

Our Morphological Rules for English:

- \( N \rightarrow V + /i\mu/ \) player
- \( N \rightarrow A + /n\varepsilon s/ \) happiness
- \( A \rightarrow V + /əbl/ \) doable
- \( A \rightarrow V + /i\eta/ \) sickening
- \( A \rightarrow A + /i\mu/ \) taller
- \( V \rightarrow /i\i/ + V \) reinvest
- \( A \rightarrow /\Lambda n/ + A \) uninteresting
- \( V \rightarrow /\Lambda n/ + V \) unlock

Observation 1:
Prefixation *never* changes the category of the word:

- \( V \rightarrow /i\i/ + V \)
- \( A \rightarrow /\Lambda n/ + A \)
- \( V \rightarrow /\Lambda n/ + V \)
Rethinking English Morphology

Our Morphological Rules for English:

- N → V + /iɪ/ player
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- A → A + /ɪŋ/ taller
- V → /iɪ/ + V reinvest
- A → /ʌŋ/ + A uninteresting
- V → /ʌŋ/ + V unlock

Observation 2:
Suffixation *sometimes* changes the category of the word:

- N → V + /iɪ/
- N → A + /nɛs/
- A → V + /əblʃ/
- A → V + /iŋ/
- A → V + /iŋ/
Rethinking English Morphology

Our Morphological Rules for English:

- N → V + /iʌ/ player
- N → A + /nɛs/ happiness
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- V → /iɪ/ + V reinvest
- A → /ʌn/ + A uninteresting
- V → /ʌn/ + V unlock

A Key Proposal:
Let’s suppose that affixes have a category type, like free words.

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<th>Suffix</th>
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Affixes and Heads

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Key Consequence:
Right-Hand Head Rule means we can get rid of our separate suffixation rules!
Affixes and Heads

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Key Consequence:
The Right-Hand Head Rule means we can get rid of our separate suffixation rules!

Suppose you put together a V and “-er” into a single word.

- The ‘RHHR’ alone says that the word must be a N.
- Therefore, we don’t need a separate rule of ‘N → V + /ɪʌ/’
### Affixes and Heads

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**Key Consequence:**
Right-Hand Head Rule means we can get rid of our separate suffixation rules!

![Diagram](attachment:image.png)

- Suppose you put together an A and “-ness” into a single word.
- The ‘RHHR’ alone says that the word must be a N.
- Therefore, we don’t need a separate rule of ‘N → A + /nɛs/’
Affixes and Heads

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Key Consequence:
Right-Hand Head Rule means we can get rid of our separate suffixation rules!

▶ Suppose you put together a V and “-able” into a single word.
▶ The ‘RHHR’ alone says that the word must be a A.
▶ Therefore, we don’t need a separate rule of ‘A → V + /əbl/’
## Affixes and Heads

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### Key Consequence:

Right-Hand Head Rule means we can get rid of our separate suffixation rules!

- Suppose you put together a V and “-ing” into a single word.
- The ‘RHHR’ alone says that the word must be a A.
- Therefore, we don’t need a separate rule of ‘A $\rightarrow$ V + /iŋ/’
Affixes and Heads

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<td>/iλ/</td>
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<td>“one who does X”</td>
</tr>
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<td>/nɛs/</td>
<td>N</td>
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Key Consequence:
Right-Hand Head Rule means we can get rid of our separate prefixation rules!

Suppose you put together “re-” and a V into a single word.

The ‘RHHR’ alone says that the word must be a V.

Therefore, we don’t need a separate rule of ‘V → /iλ/ + V’
Affixes and Heads

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<tr>
<td>/iː/</td>
<td>N</td>
<td>“one who does X”</td>
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<td>/nɛs/</td>
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Key Consequence:
Right-Hand Head Rule means we can get rid of our separate prefixation rules!

V

?? V

/çi/ /du/

► Suppose you put together “re-” and a V into a single word.
► The ‘RHHR’ alone says that the word must be a V.
► Therefore, we don’t need a separate rule of ‘V → /çi/ + V’

(Note that we cannot determine the category of “re-”)
Affixes and Heads

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Key Consequence:
Right-Hand Head Rule means we can get rid of our separate prefixation rules!

Suppose you put together “un-” and a V into a single word.

- The ‘RHHR’ alone says that the word must be a V.
- Therefore, we don’t need a separate rule of ‘V → /ʌn/ + V’

(Note that we cannot determine the category of “un-”)

V

?? V

/ʌn/ /du/
Affixes and Heads

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Key Consequence:
Right-Hand Head Rule means we can get rid of our separate prefixation rules!

Suppose you put together “un-” and a A into a single word.

- The ‘RHHR’ alone says that the word must be a A.
- Therefore, we don’t need a separate rule of ‘A → /ʌn/ + A’

(Note that we cannot determine the category of “un-”)
Affixes and Heads

Key Consequence 1:
We can now eliminate nearly all our rules of prefixation and suffixation:

\[
\begin{align*}
N & \rightarrow V + /i\mu/ \quad \text{player} \\
N & \rightarrow A + /n\varepsilon s/ \quad \text{happiness} \\
A & \rightarrow V + /\varepsilon b\varepsilon l/ \quad \text{doable} \\
A & \rightarrow V + /i\eta/ \quad \text{sickening} \\
V & \rightarrow /\mu i/ + V \quad \text{reinvest} \\
A & \rightarrow /\varepsilon n/ + A \quad \text{uninteresting} \\
V & \rightarrow /\varepsilon n/ + V \quad \text{unlock}
\end{align*}
\]
Affixes and Heads

**Key Consequence 1:**
We can now eliminate nearly all our rules of prefixation and suffixation:

- N → V + /ɪʌ/ player
- N → A + /nɛs/ happiness
- A → V + /əbʌl/ doable
- A → V + /iŋ/ sickening
- V → /rɪi/ + V reinvest
- A → /ʌn/ + A uninteresting
- V → /ʌn/ + V unlock

**Key Consequence 2:**
We now know why prefixation never changes category:

- Given the RHHR, a prefix can never be a head.
Affixes and Heads

Key Consequence 1:
We can now eliminate nearly all our rules of prefixation and suffixation:

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\begin{align*}
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A & \rightarrow /\varepsilon n/ + A \quad \text{uninteresting} \\
V & \rightarrow /\varepsilon n/ + V \quad \text{unlock}
\end{align*}
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Key Consequence 2:
We now know why prefixation never changes category:

- Given the RHHR, a prefix can \textit{never} be a head.

Key Consequence 3:
We now know why suffixation \textit{can} change category:

- Given the RHHR, a suffix \textit{can} be a head.
Suffixation that Doesn’t Change Category

Observation:
Some suffixation doesn’t change the category of the resulting word.

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<th>Rule</th>
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<td>A → A + /ɪə/</td>
<td>“taller” [tælɪə]</td>
</tr>
<tr>
<td>V → V + /d/</td>
<td>“called” [kɔld]</td>
</tr>
<tr>
<td>N → N + /z/</td>
<td>“bees” [biz]</td>
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</tbody>
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Some Elements of Morphological Theory

Other Types of Word Formation

Heads and Affixes

Inflectional vs. Derivational Affixes

The Facts
Inflectional vs. Derivational
Right-Hand Head Rule
Redux
Morpheme Ordering
Constraint

Suffixation that Doesn’t Change Category

Observation:
Some suffixation doesn’t change the category of the resulting word.

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| $V \rightarrow V + /d/$ | “called” $[\text{kald}]/$
| $N \rightarrow N + /z/$ | “bees” $[\text{biz}]/$

Question:
Do these suffixes pose a problem for our Right-Hand Head Rule?
Suffixation that Doesn’t Change Category

**Observation:**
Some suffixation *doesn’t* change the category of the resulting word.

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**Question:**
Do these suffixes pose a problem for our Right-Hand Head Rule?

**Answer:**
- These suffixes have some special properties.
- Those properties distinguish them from other affixes we’ve seen.
- Those properties suggest they are a *different kind of affix*.
- In the end, they pose no problem for our RHHR...
Differences in Productivity

**Observation 1:**
Affixes like /ʌn/, /əb/, /ɪŋ/ sometimes fail to combine with words because of their meaning.

- Undo (to reverse doing)
- Doable (able to be done)
- Annoying (makes people annoyed)

* Unshoot (to reverse shooting?)
* Arriveable (able to be arrived?)
* Eating (makes people eaten?)

Observation 2:
The suffixes /1ɒ/, /d/, /z/ never fail to combine with words because of their meaning.

I Make up any new adjective, verb, noun you like...
They will be able to combine with /1ɒ/, /d/, /z/ (respectively)

A Complication:
Some As/Vs/Ns don’t combine with /1ɒ/, /d/, /z/
*I*intelligenter, *speaked, *childs
But, these words do combine with (irregular) morphemes with the same meaning
*I*more intelligent, *spoke, *children
Differences in Productivity

Observation 1:
Affixes like /ʌŋ/, /əbl/, /iŋ/ sometimes fail to combine with words because of their meaning.

Undo (to reverse doing)      *Unshoot (to reverse shooting?)
Doable (able to be done)    *Arriveable (able to be arrived?)
Annoying (makes people annoyed)  *Eating (makes people eaten?)

Observation 2:
The suffixes /ɪɾ/, /d/, /z/ never fail to combine with words because of their meaning.

▶ Make up any new adjective, verb, noun you like...
▶ They will be able to combine with /ɪɾ/, /d/, /z/ (respectively)
Differences in Productivity

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Affixes like /ʌŋ/, /əʊl/, /iŋ/ sometimes fail to combine with words because of their meaning.

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Observation 2:
The suffixes /ɪᵢ/, /d/, /z/ never fail to combine with words because of their meaning.

- Make up any new adjective, verb, noun you like...
- They will be able to combine with /ɪᵢ/, /d/, /z/ (respectively)

A Complication: Some As/Vs/Ns don’t combine with /ɪᵢ/, /d/, /z/...
- *intelligenter, *spoken, *childs
Differences in Productivity

Observation 1:
Affixes like /ʌn/, /əbl/, /iŋ/ sometimes fail to combine with words because of their meaning.

 Undo (to reverse doing)  *Unshoot (to reverse shooting?)
 Doable (able to be done)  *Arriveable (able to be arrived?)
 Annoying (makes people annoyed)  *Eating (makes people eaten?)

Observation 2:
The suffixes /ɪŋ/, /d/, /z/ never fail to combine with words because of their meaning.

► Make up any new adjective, verb, noun you like...
► They will be able to combine with /ɪŋ/, /d/, /z/ (respectively)

A Complication: Some As/Vs/Ns don’t combine with /ɪŋ/, /d/, /z/

► *intelligenter, *spaked, *childs

But, these words do combine with (irregular) morphemes with the same meaning

► more intelligent, spoke, children
Differences in ‘Syntactic Effects’

Observation 1:
The presence of /ɪə/, /d/, /z/ can have effects on other words in a sentence.

Dave is taller than Bill
Dave has called.
The boys are happy.

*Dave is tall than Bill.
*Dave has call.
*The boy are happy.
Differences in ‘Syntactic Effects’

**Observation 1:**
The presence of /ί/, /d/, /z/ can have effects on *other words* in a sentence.

- Dave is taller than Bill
- Dave has called
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- *Dave is tall than Bill.
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- *The boy are happy.

**Observation 2:**
The presence of affixes like /n/ and /i/ *doesn’t* have any effect on the broader sentence.

- Dave will redo the assignment
- Dave will untie the ribbon
- Dave is uncool.

- Dave will do the assignment.
- Dave will tie the ribbon.
- Dave is cool.
Inflectional vs. Derivational Affixes

Summary of Observations:

- Some affixes (/ɪʌ/, /d/, /z/) have the following properties:
  - They don’t affect the category of the resulting word.
  - They never fail to combine with a word because of its meaning.
  - Their presence affects other words in the sentence.

- Other affixes have the following properties:
  - They do affect the category of the resulting word.
  - They sometimes fail to combine with words because of their meaning.
  - Their presence needn’t affect other words in the sentence.
Inflectional vs. Derivational Affixes

Inflectional Morphology
- Doesn’t affect the category of the resulting word.
- Never fails to combine with a word because of its meaning.
- Presence can affect other words in the sentence.

Derivational Morphology
- *Can* affect the category of the resulting word.
- Sometimes fails to combine with words because of their meaning.
- Presence *needn’t* affect other words in the sentence.
Inflectional vs. Derivational Affixes

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Derivational Morphology

- Can affect the category of the resulting word.
- Sometimes fails to combine with words because of their meaning.
- Presence needn’t affect other words in the sentence.

Categorization of Morphemes in English:

<table>
<thead>
<tr>
<th>Inflectional</th>
<th>Derivational</th>
</tr>
</thead>
<tbody>
<tr>
<td>/iə/ (for As)</td>
<td>/iə/ (for Vs)</td>
</tr>
<tr>
<td>/d/</td>
<td>/ŋəs/</td>
</tr>
<tr>
<td>/z/</td>
<td>/əbl/</td>
</tr>
<tr>
<td></td>
<td>/iŋ/</td>
</tr>
<tr>
<td></td>
<td>/ʌn/ (for As and Vs)</td>
</tr>
<tr>
<td></td>
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</tbody>
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Inflectional Suffixes and Category

Question:

- Why don’t inflectional suffixes affect the category of the word?
- Why does RHHR seem not to apply to them?
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- Why does RHHR seem not to apply to them?

An Idea:
Let’s suppose that, unlike derivational affixes, inflectional affixes don’t have a category.

A
  /ɪɹ/
/təl/

V
  /d/
/kəl/

N
  /z/
/bi/
Inflectional Suffixes and Category

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Revised Right-Hand Head Rule

In an English word, the head is the right-most morpheme that has a category.

The Answer:
Since inflectional suffixes don’t have a category, the word they attach to is always the head!
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The Morpheme Ordering Constraint

The following fact provides a tool for telling whether an affix is inflectional / derivational.

**The Morpheme Ordering Constraint:**

- An inflectional affix *can* be added to a word containing a derivational one.
- But, a derivational affix *can’t* be added to a word containing an inflectional one.

**Illustration:**

Bakers

```
N
/ z /
N  
V / bejk / N / iɪ /
```

*Tallerness*

```
N
A / iʊ / / nɛs /
N
A / tæl /
```
Using the Constraint

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A Test for ‘Derivational’ Status:
If a derivational affix can be added to a word containing affix X, then X must also be a derivational affix.
The Suffix ‘-Ish’

The Rule: \[ A \rightarrow A + /\text{ish}/ \]
An adjective can be formed by suffixing ‘-ish’ to an adjective.

- blue → blueish
- young → youngish
- tall → tallish
- angry → angryish

Properties of ‘-Ish’:
‘-Ish’ has some of the properties of ‘inflectional’ affixes:

- Does not affect the category of the word
- Applies to just about any adjective you can imagine.

Question: Is ‘-ish’ a *derivational* or an *inflectional* affix?
The Suffix ‘-Ish’

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If a derivational affix can be added to a word containing affix X,
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Fact:
You can add a derivational morpheme to a word containing ‘-ish’.

\begin{itemize}
  \item \textit{blueish} \textit{ness} (compare *bluerness)
  \item \textit{youngish} \textit{ness} (compare *youngerness)
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\end{itemize}

Conclusion: The suffix ‘-ish’ is indeed a derivational affix (not an inflectional one).
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