Supplementary Readings

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

- Contemporary Linguistics: Chapter 3 (pp. 70-77, 84-86)
- Language Files: Chapter 3.5 (pp. 127-133)
A Review of Where We Are

- The **phonology** of a language includes rules that affect individual phones.

- In English, [t]/[p]/[k] are aspirated at the beginning of onsets.
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  - In English, [t]/[p]/[k] are aspirated at the beginning of onsets.

- Because of such rules, we must distinguish between
  - **Phoneme**: the sound as represented in memory /X/
  - **Allophone**: the sound as actually produced [X]
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  - **Phoneme**: the sound as represented in memory /X/
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- [X] is an allophone of /Y/ if [X] is one way that speakers pronounce the sound memorized as /Y/
  - [tʰ] is an allophone of /t/ in English.
  - [t] is an allophone of /t/ in English.
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- [X] is an **allophone of** /Y/ if [X] is one way that speakers pronounce the sound memorized as /Y/
  - [tʰ] is an allophone of /t/ in English.
  - [t] is an allophone of /t/ in English.

- [tʰ] and [t] are **allophones of the same phoneme** in English.
A Review of Where We Are

- Languages differ in whether phones are allophones of the same (or different) phonemes.

Example (Thai and English):

In Thai, [t] and [tʰ] are allophones of different phonemes.
In English, [t] and [tʰ] are allophones of the same phoneme.
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Example (Thai and English):
In Thai, [t] and [tʰ] are allophones of different phonemes.
In English, [t] and [tʰ] are allophones of the same phoneme.

If there’s a minimal pair for two phones, then they’re allophones of different phonemes.

Example (Thai):
[tam] ‘to pound’ [tʰam] ‘to do’
A Review of Where We Are

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Example (Thai):
[tʰam] ‘to do’  
[tʰam] ‘to do’

If there aren’t minimal pairs for them, then they might be allophones of the same phoneme.

Example:
In English, there are no minimal pairs for [t] and [tʰ]...
An Important Point of Logic

Two phones might be in complementary distribution, but *still* be allophones of *different* phonemes.

Example: [ŋ] and [h] in English

- In English, [ŋ] is never in onsets ([bæŋ], *[ŋæb])
- In English, [h] is never in codas. ([hæt], *[tæh])
- ... So there’s no minimal pairs for [ŋ] and [h] in English...
- **But they are still allophones of *different* phonemes!**

...*Let’s see why!*
An Important Point of Logic

If [ŋ] and [h] were really allophones of the same phoneme, then...

- There would be some phoneme /X/
- There would be a rule R which requires:
  - /X/ to be pronounced as [h] in onsets
  - /X/ to be pronounced as [ŋ] in codas

Conclusion:
- There is no sensible rule that would derive [ŋ] and [h] from the same phoneme /X/.
- And so, linguists conclude that they are allophones of different phonemes.
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- But what’s /X/? (Impossible to say!)
- But this rule R looks crazy. (Trust me.)
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Conclusion:

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- And so, linguists conclude that they are allophones of different phonemes.
The Centrality of Rules

To really show that [X] and [Y] are allophones of the *same* phoneme, you have to:

- Say what phoneme they are allophones of.
- **State the rule** that determines whether that phoneme is pronounced as [X] or [Y].

Illustration: Aspiration in English

How we proved that [t] and [th] are allophones of the same phoneme:

- We discovered the following rule:
  - /p/, /t/, /k/ are aspirated at the beginning of onsets.
- This rule does two things:
  - States the phoneme that [t]/[th] are allophones of
  - States when that phoneme is pronounced as [t]/[th]
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To really show that [X] and [Y] are allophones of the same phoneme, you have to:

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How we proved that [t] and [tʰ] are allophones of the same phoneme:

- We discovered the following rule:
  - /p/, /t/, /k/ are aspirated at the beginning of onsets.
- This rule does two things:
  - States the phoneme that [t] / [tʰ] are allophones of
  - States when that phoneme is pronounced as [t] / [tʰ]
Deducing Allophonic Rules

To show that [X] and [Y] are allophones of different phonemes, you have to:

▶ Find a **minimal pair** for [X] and [Y].

To really show that [X] and [Y] are allophones of the same phoneme, you have to:

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▶ **State the rule** that determines whether that phoneme is pronounced as [X] or [Y].

**Burning Question:** How, exactly, do we go about looking for these rules?

▶ The whole process can be broken down into manageable sub-tasks...
How to Solve ‘Phonology Problems’

The General Task:
Determine whether [X] and [Y] are allophones of the same phoneme.

The Procedure:

1. First Main Sub-Task:
   Determine if there are minimal pairs for [X] and [Y].
   ▶ If there are, STOP!
     ▶ [X] and [Y] are allophones of different phonemes.
   ▶ If there aren’t, move on to Second Main Sub-Task.

2. Second Main Sub-Task:
   Determine if there is a rule deriving [X] and [Y] from the same phoneme.
Vowel Length in Kikuyu

- In Kikuyu, some vowels are ‘long’ (in duration) and others are ‘short’ (in duration).
- In IPA, [\(V:\)] = the vowel V is ‘long’

<table>
<thead>
<tr>
<th>[kera]</th>
<th>‘cross over’</th>
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<th>‘realize’</th>
</tr>
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<tr>
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<tr>
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Question:
In Kikuyu, are the long vowels and short vowels allophones of the same phoneme?
Vowel Length in Kikuyu

- In Kikuyu, some vowels are ‘long’ (in duration) and others are ‘short’ (in duration).
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### Vowel Length in Kikuyu

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**First Main Sub-Task:**
Are there minimal pairs for the long vowels and the short vowels?
Vowel Length in Kikuyu

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Result:
There are! So we stop.
Vowel Length in Kikuyu

- In Kikuyu, some vowels are ‘long’ (in duration) and others are ‘short’ (in duration).
- In IPA, [V:] = the vowel V is ‘long’

Vowel Length in Kikuyu

- [kera] ‘cross over’
- [ďaka] ‘beautiful’
- [kua] ‘die’
- [ďura] ‘spit’
- [kora] ‘find’
- [keːra] ‘realize’
- [ďaːka] ‘play’
- [kuːa] ‘carry’
- [ďuːra] ‘stay’
- [kɔːra] ‘little frog’

Conclusion:
In Kikuyu, long vowels and short vowels are allophones of different phonemes.
In English, too, some vowels are ‘long’ and others are ‘short’.

Vowel Length in English

| ‘ride’   | [ɹaːjd] | ‘right’ | [ɹajt] | ‘rye’ | [ɹaj] |
| ‘aid’    | [eːjd]  | ‘ate’   | [ejt]  | ‘bay’  | [bej] |
| ‘lobe’   | [loːwb] | ‘lope’  | [lowp] | ‘low’  | [low] |
| ‘teethe’ | [θiːð]  | ‘teeth’ | [θið]  | ‘tea’  | [ti]  |
| ‘save’   | [sɛːv]  | ‘safe’  | [sɛf]  | ‘say’  | [sɛ]  |

Question:
In English, are the long vowels and short vowels allophones of the same phoneme?
Vowel Length in English

In English, too, some vowels are ‘long’ and others are ‘short’.

Vowel Length in English

| 'ride'  | [u:a:jd] | 'right' | [uajt] | 'rye'  | [uaj] |
| 'aid'   | [e:id]  | 'ate'   | [e:t]  | 'bay'  | [bej] |
| 'lobe'  | [lo:wb] | 'lope'  | [lowp] | 'low'  | [low] |
| 'teethe'| [tʰi:ə] | 'teeth' | [tʰiθ] | 'tea'  | [ti]  |
| 'save'  | [se:jv] | 'safe'  | [sejf] | 'say'  | [sej] |

First Main Sub-Task:
Are there minimal pairs for the long vowels and the short vowels?
Vowel Length in English

In English, too, some vowels are ‘long’ and others are ‘short’.

<table>
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<tr>
<th>Vowel</th>
<th>Length</th>
<th>Phonetic Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘ride’</td>
<td>long</td>
<td>[aːjd]</td>
</tr>
<tr>
<td>‘aid’</td>
<td>short</td>
<td>[eːjd]</td>
</tr>
<tr>
<td>‘lobe’</td>
<td>long</td>
<td>[loːwb]</td>
</tr>
<tr>
<td>‘teethe’</td>
<td>short</td>
<td>[tʰiːd]</td>
</tr>
<tr>
<td>‘save’</td>
<td>short</td>
<td>[seːjv]</td>
</tr>
<tr>
<td>‘right’</td>
<td>long</td>
<td>[aːjt]</td>
</tr>
<tr>
<td>‘ate’</td>
<td>short</td>
<td>[ejt]</td>
</tr>
<tr>
<td>‘lope’</td>
<td>long</td>
<td>[lowp]</td>
</tr>
<tr>
<td>‘teeth’</td>
<td>short</td>
<td>[tʰiθ]</td>
</tr>
<tr>
<td>‘safe’</td>
<td>short</td>
<td>[sej]</td>
</tr>
<tr>
<td>‘rye’</td>
<td>short</td>
<td>[aːj]</td>
</tr>
<tr>
<td>‘bay’</td>
<td>short</td>
<td>[bej]</td>
</tr>
<tr>
<td>‘low’</td>
<td>short</td>
<td>[low]</td>
</tr>
<tr>
<td>‘tea’</td>
<td>short</td>
<td>[ti]</td>
</tr>
<tr>
<td>‘say’</td>
<td>short</td>
<td>[sej]</td>
</tr>
</tbody>
</table>

Result:

▶ There aren’t any minimal pairs for short and long vowels.
▶ So, on to Second Main Sub-Task...
Vowel Length in English

In English, too, some vowels are ‘long’ and others are ‘short’.

<table>
<thead>
<tr>
<th>Vowel Length in English</th>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>‘ride’ [uːaːjd]</td>
<td>‘right’ [uːajt]</td>
<td>‘rye’ [uːaj]</td>
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<td>‘bay’ [bej]</td>
</tr>
<tr>
<td>‘lobe’ [loːwb]</td>
<td>‘lope’ [loːwp]</td>
<td>‘low’ [low]</td>
</tr>
<tr>
<td>‘teethe’ [θiːð]</td>
<td>‘teeth’ [θiːθ]</td>
<td>‘tea’ [tɪ]</td>
</tr>
<tr>
<td>‘save’ [seːjv]</td>
<td>‘safe’ [seːf]</td>
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</table>

Second Main Sub-Task:
Determine if there is a rule deriving the long and short vowels from the same phoneme.
Breaking Down Second Main Sub-Task

Question:
But, now how do we find out if there is such a rule?
Breaking Down Second Main Sub-Task

Question:
But, now how do we find out if there is such a rule?

Answer:
We will break down this sub-task into (four) smaller sub-steps.

Vocabulary:
The environment of a phone [X] in some word W =
The phones that immediately precede and follow [X] in W.
Breaking Down Second Main Sub-Task

The Logic of Our Search:
We want to figure out which is true (if any):

1. There’s a rule that turns long vowels into short vowels in some environment.
2. There’s a rule that turns short vowels into long vowels in some environment.
Breaking Down Second Main Sub-Task

The Logic of Our Search:
We want to figure out which is true (if any):

1. There’s a rule that turns long vowels into short vowels in some environment.
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Some Reasoning:
▶ If (1) were true, then...
  ▶ there’d be an environment where only short vowels show up (no long vowels).
Breaking Down Second Main Sub-Task

The Logic of Our Search:
We want to figure out which is true (if any):

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Some Reasoning:

► If (1) were true, then...
  ▶ there’d be an environment where only short vowels show up (no long vowels).

► If (2) were true, then...
  ▶ there’d be an environment where only long vowels show up (no short vowels).
Breaking Down Second Main Sub-Task

Summary:
We now want to figure out which is true (if any):

1. There’s an environment where you only find short vowels.
   ▶ If so, then there’s a rule turning long vowels into short ones there.

2. There’s an environment where you only find long vowels.
   ▶ If so, then there’s a rule turning short vowels into long ones there.

There are four steps to figuring out which of these is true.
Step 1: Get the Environments

Determine the environments of the two phones.

- Write up four lists:
  1. The phones that precede a long vowel.
  2. The phones that follow a long vowel.
  3. The phones that precede a short vowel.
  4. The phones that follow a short vowel.

Notation: ‘#’ = the edge of a word
Step 1: Get the Environments

Step 1:
Determine the environments of the long and short vowels.

‘ride’ [ɹaːjd] ‘right’ [ɹajt] ‘rye’ [ɹaj]
‘aid’ [eːjd] ‘ate’ [ejwt] ‘bay’ [bej]
‘lobe’ [loːwb] ‘lope’ [lowp] ‘low’ [low]
‘teethe’ [tʰiːð] ‘teeth’ [tʰiθ] ‘tea’ [ti]
‘save’ [seːjv] ‘safe’ [sejʃ] ‘say’ [sej]
Step 1: Get the Environments

Step 1:
Determine the environments of the long and short vowels.

‘ride’ [raːjd]  ‘right’ [rajt]  ‘rye’ [raj]
‘aid’ [eːjd]  ‘ate’ [ejt]  ‘bay’ [bej]
‘lobe’ [loːwb]  ‘lope’ [lowp]  ‘low’ [low]
‘teethe’ [θiːð]  ‘teeth’ [θiθ]  ‘tea’ [ti]
‘save’ [seːjv]  ‘safe’ [sejf]  ‘say’ [sej]

▶ The phones that precede a long vowel.
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

‘ride’ [ʌaːjd]  ‘right’ [ʌajt]  ‘rye’ [ʌaj]
‘aid’ [eːjd]  ‘ate’ [ejt]  ‘bay’ [bej]
‘lobe’ [loːwb]  ‘lope’ [lowp]  ‘low’ [low]
‘teethe’ [tʰiːð]  ‘teeth’ [tʰiθ]  ‘tea’ [ti]
‘save’ [seːjv]  ‘safe’ [sejf]  ‘say’ [sej]

▶ The phones that precede a long vowel.
▶ [ɹ]
Step 1: Get the Environments

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- ‘ride’ [ɹaːjd]  ‘right’ [ɹajt]  ‘rye’ [ɹaj]
  ‘aid’ [eːjd]  ‘ate’ [ejt]  ‘bay’ [bej]
  ‘lobe’ [loːwb]  ‘lope’ [lowp]  ‘low’ [low]
  ‘teethe’ [θiːð]  ‘teeth’ [θiθ]  ‘tea’ [ti]
  ‘save’ [seːjv]  ‘safe’ [sejf]  ‘say’ [sej]

- The phones that precede a long vowel.
  - [ɹ] #
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

<table>
<thead>
<tr>
<th>Word</th>
<th>Long Vowel</th>
<th>Short Vowel</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘ride’</td>
<td>[ɹaɪd]</td>
<td></td>
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<td>‘aid’</td>
<td>[ɛɪd]</td>
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</tr>
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▶ The phones that precede a long vowel.

▶ [ɹ] # [l]
Step 1: Get the Environments

Determine the environments of the long and short vowels.

- 'ride' [ɪəːd]  
  - The phones that precede a long vowel.
  
  - [ɪ] # [l] [tʰ]

- 'aid' [ɛːd]  
- 'lobe' [loːwb]  
- 'teethe' [tʰiːð]  
- 'save' [seːv]

- 'right' [aɪt]  
- 'ate' [eɪt]  
- 'lope' [loʊp]  
- 'teeth' [tʰiθ]

- 'rye' [aɪ]  
- 'bay' [beɪ]  
- 'low' [ləʊ]

- 'teethe' [tʰiːð]
- 'teeth' [tʰiθ]
- 'tea' [ti]
- 'say' [sej]
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

- ‘ride’ /[ruːd]/
- ‘aid’ /[eːd]/
- ‘lobe’ /[loːwb]/
- ‘teethe’ /[θiːð]/
- ‘save’ /[seːv]/
- ‘right’ /[ruːt]/
- ‘ate’ /[eɪt]/
- ‘lope’ /[lɒp]/
- ‘teeth’ /[θiːθ]/
- ‘safe’ /[seːf]/
- ‘rye’ /[rəj]/
- ‘bay’ /[beɪ]/
- ‘low’ /[lɔʊ]/
- ‘tea’ /[tiː]/
- ‘say’ /[seɪ]/

- The phones that precede a long vowel.
  - /[r] [l] [θ] [s]"
Step 1: Get the Environments

Determine the environments of the long and short vowels.

- ‘ride’ [ɪɹd] ‘right’ [ɹaɪt] ‘rye’ [ɹaɪ]
- ‘aid’ [eɪd] ‘ate’ [eɪt] ‘bay’ [beɪ]
- ‘save’ [sev] ‘safe’ [sef] ‘say’ [sej]

▶ The phones that precede a long vowel.
  ▶ [ɪ] # [l] [θ] [s]
▶ The phones that follow a long vowel.
Step 1: Get the Environments

Step 1:
Determine the environments of the long and short vowels.

- ‘ride’ [ɹaːjd]  ‘right’ [ɹajt]  ‘rye’ [ɹaj]
- ‘aid’ [eːjd]  ‘ate’ [ejt]  ‘bay’ [bej]
- ‘lobe’ [loːwb]  ‘lope’ [ləwp]  ‘low’ [low]
- ‘teethe’ [tʰiːð]  ‘teeth’ [tʰiθ]  ‘tea’ [ti]
- ‘save’ [seːjv]  ‘safe’ [sejf]  ‘say’ [sej]

▶ The phones that precede a long vowel.
  ▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a long vowel.
  ▶ [d]
Step 1: Get the Environments

Determine the environments of the long and short vowels.

- **‘ride’** [ɪd] [ɹɪd]  
  - The phones that precede a long vowel.
    - [ɪ] [l] [θ] [s]
  - The phones that follow a long vowel.
    - [d] [b]
  - ‘right’ [rɪt]  
  - ‘rye’ [ɹi]  
- **‘aid’** [eɪd]  
- **‘lobe’** [loʊb]  
- **‘teethe’** [tʰið]  
- **‘save’** [seɪv]  
- **‘aid’** [eɪd]  
- **‘ate’** [eɪ]  
- **‘lope’** [loʊp]  
- **‘teeth’** [tʰiθ]  
- **‘safe’** [seɪf]  
- **‘bay’** [beɪ]  
- **‘low’** [lɔ]  
- **‘tea’** [ti]  
- **‘say’** [seɪ]
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

`ride` [ɹaːjɑːd]  `right` [ɹaːjt]  `rye` [ɹɑːj]
`aid` [ɛːjɑːd]  `ate` [ɛjt]  `bay` [bej]
`lobe` [loːwɑːb]  `lope` [lowp]  `low` [low]
`teethe` [tʰiːð]  `teeth` [tʰiθ]  `tea` [ti]
`save` [səvɑː]  `safe` [səf]  `say` [sə]

▶ The phones that precede a long vowel.

▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a long vowel.

▶ [d] [b] [ð]
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

- **‘ride’** [ɹaːjd]  ‘right’ [ɹajt]  ‘rye’ [ɹaj]
- **‘aid’** [eːjd]  ‘ate’ [ejt]  ‘bay’ [bej]
- **‘teethe’** [tʰiːð]  ‘teeth’ [tʰiθ]  ‘tea’ [ti]
- **‘save’** [seːʃv]  ‘safe’ [seʃf]  ‘say’ [sej]

- **The phones that precede a long vowel.**
  - [ɹ] [l] [tʰ] [s]
- **The phones that follow a long vowel.**
  - [d] [b] [ð] [v]
Step 1: Get the Environments

Step 1:
Determine the environments of the long and short vowels.

| ‘ride’   | [ɹaːd]       | ‘right’   | [ɹaːt]       | ‘rye’     | [ɹe]   |
| ‘aid’    | [eːd]        | ‘ate’     | [eɪt]        | ‘bay’     | [be]   |
| ‘lobe’   | [lɔːb]       | ‘lope’    | [lowp]       | ‘low’     | [lɔː]  |
| ‘teethe’ | [tʰiː]       | ‘teeth’   | [tʰiθ]       | ‘tea’     | [ti]   |
| ‘save’   | [seːv]       | ‘safe’    | [sef]        | ‘say’     | [se]   |

▶ The phones that precede a long vowel.
  ▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]

▶ The phones that precede a short vowel
Step 1: Get the Environments

Step 1:
Determine the environments of the long and short vowels.

‘ride’       [ɹaːjd]  ‘right’       [ɹajt]  ‘rye’        [ɹaj]
‘aid’        [eːjd]  ‘ate’        [ejt]  ‘bay’        [bej]
‘lobe’       [loːwb]  ‘lope’       [lowp]  ‘low’        [low]
‘teethe’     [tʰiːð]  ‘teeth’      [tʰiθ]  ‘tea’        [ti]
‘save’       [seːjv]  ‘safe’       [sejf]  ‘say’        [sej]

▶ The phones that precede a long vowel.
  ▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]

▶ The phones that precede a short vowel
  ▶ [ɹ]
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

- ‘ride’ [raːjd]  ‘right’ [rajt]  ‘rye’ [raj]
- ‘aid’ [eːjd]  ‘ate’ [eʃt]  ‘bay’ [bej]
- ‘teethe’ [tʰiːð]  ‘teeth’ [tʰiθ]  ‘tea’ [ti]
- ‘save’ [seːʃv]  ‘safe’ [seʃf]  ‘say’ [sej]

- The phones that precede a long vowel.
  - [ɹ] # [l] [tʰ] [s]
- The phones that follow a long vowel.
  - [d] [b] [ð] [v]
- The phones that precede a short vowel
  - [ɹ] #
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

- ‘ride’ [ɪəːd]  ‘right’ [ræːt]  ‘rye’ [ræj]
- ‘aid’ [eɪd]  ‘ate’ [eɪt]  ‘bay’ [beɪ]
- ‘lobe’ [loʊb]  ‘lope’ [lɑːp]  ‘low’ [loʊ]
- ‘save’ [sɑːv]  ‘safe’ [sɑːf]  ‘say’ [sæj]

- The phones that precede a long vowel.
  - [ɒ] # [l] [θ] [s]
- The phones that follow a long vowel.
  - [d] [b] [ð] [v]
- The phones that precede a short vowel
  - [ɒ] # [l]
### Step 1: Get the Environments

Determine the environments of the long and short vowels.

<table>
<thead>
<tr>
<th>Word</th>
<th>Phonemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘ride’</td>
<td>[ɪəːd]</td>
</tr>
<tr>
<td>‘right’</td>
<td>[ɪajt]</td>
</tr>
<tr>
<td>‘rye’</td>
<td>[ɪaj]</td>
</tr>
<tr>
<td>‘aid’</td>
<td>[ɛːd]</td>
</tr>
<tr>
<td>‘ate’</td>
<td>[ɛjt]</td>
</tr>
<tr>
<td>‘bay’</td>
<td>[bej]</td>
</tr>
<tr>
<td>‘lobe’</td>
<td>[loːwb]</td>
</tr>
<tr>
<td>‘lope’</td>
<td>[lowp]</td>
</tr>
<tr>
<td>‘low’</td>
<td>[low]</td>
</tr>
<tr>
<td>‘teethe’</td>
<td>[tʰiːθ]</td>
</tr>
<tr>
<td>‘teeth’</td>
<td>[tʰiθ]</td>
</tr>
<tr>
<td>‘tea’</td>
<td>[ti]</td>
</tr>
<tr>
<td>‘save’</td>
<td>[sɛːv]</td>
</tr>
<tr>
<td>‘safe’</td>
<td>[sɛf]</td>
</tr>
<tr>
<td>‘say’</td>
<td>[sɛj]</td>
</tr>
</tbody>
</table>

- **The phones that precede a long vowel.**
  - [ɪ] # [l] [tʰ] [s]

- **The phones that follow a long vowel.**
  - [d] [b] [ð] [v]

- **The phones that precede a short vowel**
  - [ɪ] # [l] [tʰ]
Step 1: Get the Environments

Determine the environments of the long and short vowels.

- ‘ride’  [ɹaːjd]  ‘right’  [ɹaɪt]  ‘rye’  [ɹaɪ]
- ‘aid’  [eːjd]  ‘ate’  [eɪt]  ‘bay’  [beɪ]
- ‘lobe’  [loːwb]  ‘lope’  [ləʊp]  ‘low’  [ləʊ]
- ‘teethe’  [tʰiːð]  ‘teeth’  [tʰiθ]  ‘tea’  [ti]

- The phones that precede a long vowel.
  - [ɹ] # [l] [tʰ] [s]
- The phones that follow a long vowel.
  - [d] [b] [ð] [v]
- The phones that precede a short vowel
  - [ɹ] # [l] [tʰ] [s]
## Step 1: Get the Environments

**Step 1:**

Determine the environments of the long and short vowels.

<table>
<thead>
<tr>
<th>‘ride’</th>
<th>[ɹaːjd]</th>
<th>‘right’</th>
<th>[ɹajt]</th>
<th>‘rye’</th>
<th>[ɹaj]</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘aid’</td>
<td>[eːjd]</td>
<td>‘ate’</td>
<td>[e jt]</td>
<td>‘bay’</td>
<td>[bej]</td>
</tr>
<tr>
<td>‘lobe’</td>
<td>[loːwb]</td>
<td>‘lope’</td>
<td>[lowp]</td>
<td>‘low’</td>
<td>[low]</td>
</tr>
<tr>
<td>‘teethe’</td>
<td>[tʰiːð]</td>
<td>‘teeth’</td>
<td>[tʰiθ]</td>
<td>‘tea’</td>
<td>[ti]</td>
</tr>
<tr>
<td>‘save’</td>
<td>[seːjv]</td>
<td>‘safe’</td>
<td>[sejf]</td>
<td>‘say’</td>
<td>[sej]</td>
</tr>
</tbody>
</table>

- **The phones that precede a long vowel.**
  - [ɹ] # [l] [tʰ] [s]

- **The phones that follow a long vowel.**
  - [d] [b] [ð] [v]

- **The phones that precede a short vowel**
  - [ɹ] # [l] [tʰ] [s]

- **The phones that follow a short vowel**
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

<table>
<thead>
<tr>
<th>Long Vowels</th>
<th>Short Vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘ride’</td>
<td>[ɪaːd]</td>
</tr>
<tr>
<td>‘aid’</td>
<td>[eːd]</td>
</tr>
<tr>
<td>‘lobe’</td>
<td>[loːwb]</td>
</tr>
<tr>
<td>‘teethe’</td>
<td>[θiːð]</td>
</tr>
<tr>
<td>‘save’</td>
<td>[sɛːv]</td>
</tr>
<tr>
<td>‘right’</td>
<td>[аːt]</td>
</tr>
<tr>
<td>‘ate’</td>
<td>[eːt]</td>
</tr>
<tr>
<td>‘lope’</td>
<td>[lɔːp]</td>
</tr>
<tr>
<td>‘teeth’</td>
<td>[θiːθ]</td>
</tr>
<tr>
<td>‘safe’</td>
<td>[sɛf]</td>
</tr>
<tr>
<td>‘rye’</td>
<td>[аːj]</td>
</tr>
<tr>
<td>‘bay’</td>
<td>[bej]</td>
</tr>
<tr>
<td>‘low’</td>
<td>[lɔ]</td>
</tr>
<tr>
<td>‘tea’</td>
<td>[t̪iː]</td>
</tr>
<tr>
<td>‘say’</td>
<td>[sɛj]</td>
</tr>
</tbody>
</table>

▶ The phones that precede a long vowel.
  ▶ [ɪ] # [l] [θ] [s]

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ʊ] [v]

▶ The phones that precede a short vowel
  ▶ [ɪ] # [l] [θ] [s]

▶ The phones that follow a short vowel
  ▶ [t]
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

'ride' [ɹaːjd]   'right' [ɹaːjt]   'rye' [ɹəj]
'aid' [eːjd]   'ate' [ejt]   'bay' [bej]
'lobe' [loːwb]   'lope' [lowp]   'low' [low]
'teethe' [tʰiːð]   'teeth' [tʰiθ]   'tea' [ti]
'save' [seːjv]   'safe' [sejf]   'say' [sej]

▶ The phones that precede a long vowel.
  ▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]

▶ The phones that precede a short vowel
  ▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a short vowel
  ▶ [t] [p]
Step 1: Get the Environments

Step 1:
Determine the environments of the long and short vowels.

- ‘ride’ [ɹaːjd]  ‘right’ [ɹajt]  ‘rye’ [ɹaj]
- ‘aid’ [eːjd]  ‘ate’ [eɪt]  ‘bay’ [beɪ]
- ‘lobe’ [loːwb]  ‘lope’ [lʌp]  ‘low’ [lʌ]
- ‘teethe’ [tʰiːð]  ‘teeth’ [tʰiθ]  ‘tea’ [ti]
- ‘save’ [seːjv]  ‘safe’ [seɪf]  ‘say’ [seɪ]

▶ The phones that precede a long vowel.
  ▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]

▶ The phones that precede a short vowel
  ▶ [ɹ] # [l] [tʰ] [s]

▶ The phones that follow a short vowel
  ▶ [t] [p] [θ]
Step 1: Get the Environments

Step 1: Determine the environments of the long and short vowels.

- ‘ride’  [raːjd]  ‘right’  [rajt]  ‘rye’  [raj]
  ‘aid’  [ei:jd]  ‘ate’  [ejt]  ‘bay’  [bej]
  ‘lobe’  [loːwb]  ‘lope’  [lowp]  ‘low’  [low]
  ‘save’  [seːjv]  ‘safe’  [sejʃ]  ‘say’  [sej]

- The phones that precede a long vowel.
  - [ɹ] [l] [tʰ] [s]

- The phones that follow a long vowel.
  - [d] [b] [ð] [v]

- The phones that precede a short vowel.
  - [ɹ] [l] [tʰ] [s]

- The phones that follow a short vowel.
  - [t] [p] [θ] [f]
Step 1: Get the Environments

Determine the environments of the long and short vowels.

- ‘ride’ [raːjd]   ‘right’ [rajt]   ‘rye’ [raj]
  ‘aid’ [eːjd]    ‘ate’ [ejt]   ‘bay’ [bej]
  ‘lobe’ [loːwb]  ‘lope’ [lowp]  ‘low’ [low]
  ‘teethe’ [tiθ]  ‘teeth’ [tiθ]  ‘tea’ [ti]
  ‘save’ [seːjv]  ‘safe’ [sejʃ]  ‘say’ [sej]

▶ The phones that precede a long vowel.
  ▶ [ɻ] # [l] [tʰ] [s]
▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]
▶ The phones that precede a short vowel
  ▶ [ɻ] # [l] [tʰ] [s]
▶ The phones that follow a short vowel
  ▶ [t] [p] [θ] [f] #
Step 2: Look for Similarities

For each environment, look for similarities between the sounds.

- Write up four lists:
  1. Similarities between phones preceding a long vowel
  2. Similarities between phones following a long vowel
  3. Similarities between phones preceding a short vowel
  4. Similarities between phones following a short vowel

Note: No phones share anything in common with ‘#’
Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

‘ride’ [ɪəːd]  ‘right’ [ɪaːt]  ‘rye’ [ɪeɪ]
‘aid’ [ɛːd]  ‘ate’ [eɪt]  ‘bay’ [bej]
‘lobe’ [loːwb]  ‘lope’ [loʊp]  ‘low’ [lou]
‘teethe’ [θiːd]  ‘teeth’ [θiːθ]  ‘tea’ [ti]
‘save’ [sæv]  ‘safe’ [sef]  ‘say’ [sej]

▶ The phones that precede a long vowel.

▶ [ɪ] # [l] [θ] [s]
## Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

<table>
<thead>
<tr>
<th>‘ride’</th>
<th>[ɹeːjd]</th>
<th>‘right’</th>
<th>[ɹajt]</th>
<th>‘rye’</th>
<th>[ɹaj]</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘aid’</td>
<td>[ɛːjd]</td>
<td>‘ate’</td>
<td>[ɛjt]</td>
<td>‘bay’</td>
<td>[bej]</td>
</tr>
<tr>
<td>‘lobe’</td>
<td>[loːwb]</td>
<td>‘lope’</td>
<td>[lowp]</td>
<td>‘low’</td>
<td>[low]</td>
</tr>
<tr>
<td>‘teethe’</td>
<td>[tʰiːð]</td>
<td>‘teeth’</td>
<td>[tʰiθ]</td>
<td>‘tea’</td>
<td>[ti]</td>
</tr>
<tr>
<td>‘save’</td>
<td>[seːjv]</td>
<td>‘safe’</td>
<td>[sejf]</td>
<td>‘say’</td>
<td>[sej]</td>
</tr>
</tbody>
</table>

▶ The phones that precede a long vowel.

▶ [ɹ] # [l] [tʰ] [s]  **Nothing in common**
Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

- ‘ride’ [ɪəːd]  ‘right’ [ɪəjt]  ‘rye’ [ɪəj]
- ‘aid’ [ɛɪd]  ‘ate’ [ɛjt]  ‘bay’ [bej]
- ‘teethe’ [tʰiːd]  ‘teeth’ [tʰiθ]  ‘tea’ [ti]
- ‘save’ [seɪv]  ‘safe’ [sejf]  ‘say’ [sej]

▶ The phones that precede a long vowel.
  ▶ [ɪ] # [l] [tʰ] [s]  **Nothing in common**

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]
Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

| ‘ride’  | [uə:jd] | ‘right’ | [uajt] | ‘rye’  | [uaj] |
| ‘aid’   | [eː:jd] | ‘ate’   | [ejt]  | ‘bay’  | [bej] |
| ‘save’  | [seː:jv] | ‘safe’  | [sejf] | ‘say’  | [sej] |

▶ The phones that precede a long vowel.
▶ [ɹ] # [l] [tʰ] [s]  Nothing in common

▶ The phones that follow a long vowel.
▶ [d] [b] [ð] [v]  All are voiced!
Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

| ‘ride’   | [ˌaːjd] | ‘right’ | [ˌaːjt] | ‘rye’   | [ˌaːj] |
| ‘aid’    | [eːjd]  | ‘ate’   | [eːjt]  | ‘bay’   | [bej]  |
| ‘lobe’   | [loːwb] | ‘lope’  | [lowp]  | ‘low’   | [low]  |
| ‘teethe’ | [ˌtʰiːð] | ‘teeth’ | [ˌtʰiθ] | ‘tea’   | [ti]   |
| ‘save’   | [səːv]  | ‘safe’  | [səf]   | ‘say’   | [sə]   |

▶ The phones that precede a long vowel.
  ▶ [ɹ] # [l] [tʰ] [s]  Nothing in common

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]  All are voiced!

▶ The phones that precede a short vowel
  ▶ [ɹ] # [l] [tʰ] [s]
Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

‘ride’ [uːaːjd]  ‘right’ [uːaːjt]  ‘rye’ [uːaj]
‘aid’ [eːjd]  ‘ate’ [eːjt]  ‘bay’ [beːj]
‘lobe’ [loːwb]  ‘lope’ [loːwp]  ‘low’ [low]
‘teethe’ [tʰiː:j]  ‘teeth’ [tʰiːθ]  ‘tea’ [ti]
‘save’ [sɛːːv]  ‘safe’ [sɛːf]  ‘say’ [sej]

▶ The phones that precede a long vowel.
  ▶ [ʌ] # [l] [tʰ] [s]  Nothing in common

▶ The phones that follow a long vowel.
  ▶ [d] [b] [ð] [v]  All are voiced!

▶ The phones that precede a short vowel
  ▶ [ʌ] # [l] [tʰ] [s]  Nothing in common
Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

- ‘ride’  [ɪəːd]  ‘right’  [ɪəjt]  ‘rye’  [ɪəj]
- ‘aid’  [eːd]  ‘ate’  [ejt]  ‘bay’  [bej]
- ‘lobe’  [loːb]  ‘lope’  [lowp]  ‘low’  [lo]
- ‘teethe’  [tʰiːð]  ‘teeth’  [tʰiθ]  ‘tea’  [ti]
- ‘save’  [səːv]  ‘safe’  [səjf]  ‘say’  [sə]

- The phones that precede a long vowel.
  - [a] # [l] [tʰ] [s]  Nothing in common
  - [d] [b] [ð] [v]  All are voiced!
- The phones that follow a long vowel.
  - [a] # [l] [tʰ] [s]  Nothing in common
- The phones that precede a short vowel
  - [a] # [l] [tʰ] [s]  Nothing in common
- The phones that follow a short vowel
  - [t] [p] [θ] [f] #
Step 2: Look for Similarities

Step 2:
For each environment, look for any commonalities between the sounds in question.

- ‘ride’ [ʌaːjd]  ‘right’ [ʌajt]  ‘rye’ [ʌaj]
- ‘aid’ [eːjd]  ‘ate’ [eɪjt]  ‘bay’ [bej]
- ‘lobe’ [loːwb]  ‘lope’ [lɒwp]  ‘low’ [lɒw]
- ‘teethe’ [θiːð]  ‘teeth’ [θiːθ]  ‘tea’ [ti]
- ‘save’ [seːjv]  ‘safe’ [sejf]  ‘say’ [sej]

- The phones that precede a long vowel.
  - [ʌ] [l] [θ] [s] Nothing in common
- The phones that follow a long vowel.
  - [d] [b] [ð] [v] All are voiced!
- The phones that precede a short vowel
  - [ʌ] [l] [θ] [s] Nothing in common
- The phones that follow a short vowel
  - [t] [p] [θ] [f] # Nothing in common
Step 3: Look for Unique Environment

See if any of the environments are unique to a particular allophone.

- For each allophone [X]...
  - Look at environments for [X] where the sounds share a feature in common.
  - Check whether the corresponding environment for [Y] can have that feature.
  - If not, then that environment is unique to [X]!
Step 3: Look for Unique Environment

Step 3:
See if any environments are unique to a particular allophone.

<table>
<thead>
<tr>
<th>Word</th>
<th>[Transcription]</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘ride’</td>
<td>[ɹaːjd]</td>
</tr>
<tr>
<td>‘aid’</td>
<td>[eːjd]</td>
</tr>
<tr>
<td>‘lobe’</td>
<td>[loːwb]</td>
</tr>
<tr>
<td>‘teethe’</td>
<td>[tʰiːð]</td>
</tr>
<tr>
<td>‘save’</td>
<td>[seːjv]</td>
</tr>
<tr>
<td>‘right’</td>
<td>[ɹaːjt]</td>
</tr>
<tr>
<td>‘ate’</td>
<td>[ejt]</td>
</tr>
<tr>
<td>‘lope’</td>
<td>[lowp]</td>
</tr>
<tr>
<td>‘teeth’</td>
<td>[tʰiθ]</td>
</tr>
<tr>
<td>‘safe’</td>
<td>[sejf]</td>
</tr>
<tr>
<td>‘rye’</td>
<td>[ɹaj]</td>
</tr>
<tr>
<td>‘bay’</td>
<td>[bej]</td>
</tr>
<tr>
<td>‘low’</td>
<td>[low]</td>
</tr>
<tr>
<td>‘tea’</td>
<td>[ti]</td>
</tr>
<tr>
<td>‘say’</td>
<td>[sej]</td>
</tr>
</tbody>
</table>
Step 3: Look for Unique Environment

See if any environments are unique to a particular allophone.


- The phones that precede a long vowel.
  - [ɹ] # [l] [tʰ] [s]  **Nothing in common**
  - [d] [b] [ð] [v]  **All are voiced!**

- The phones that follow a long vowel.
  - [ɹ] # [l] [tʰ] [s]  **Nothing in common**

- The phones that precede a short vowel
  - [ɹ] # [l] [tʰ] [s]  **Nothing in common**

- The phones that follow a short vowel
  - [t] [p] [θ] [f] #  **Nothing in common**
Step 3: Look for Unique Environment

See if any environments are unique to a particular allophone.

- Look at the environments where the phones share a feature in common.

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ride</td>
<td>[ᵻaːjd]</td>
</tr>
<tr>
<td>right</td>
<td>[ᵻajt]</td>
</tr>
<tr>
<td>rye</td>
<td>[ᵻaj]</td>
</tr>
<tr>
<td>aid</td>
<td>[eːjd]</td>
</tr>
<tr>
<td>ate</td>
<td>[ejt]</td>
</tr>
<tr>
<td>bay</td>
<td>[bej]</td>
</tr>
<tr>
<td>lobe</td>
<td>[loːwb]</td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
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<td>[tʰiːð]</td>
</tr>
<tr>
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</tr>
<tr>
<td>say</td>
<td>[sej]</td>
</tr>
</tbody>
</table>

- The phones that precede a long vowel.
  - [ʃ] # [l] [tʰ] [s] **Nothing in common**

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  - [d] [b] [ð] [v] **All are voiced!**

- The phones that precede a short vowel
  - [ʃ] # [l] [tʰ] [s] **Nothing in common**

- The phones that follow a short vowel
  - [t] [p] [θ] [f] # **Nothing in common**
Step 3: Look for Unique Environment

Step 3:
See if any environments are unique to a particular allophone.

- Look at the environments where the phones share a feature in common.

- The phones that follow a long vowel.
  - [d] [b] [ð] [v] All are voiced!
Step 3: Look for Unique Environment

Step 3:
See if any environments are unique to a particular allophone.

- Look at the corresponding environment for the other phone.
- See if they can share that feature too.

| ‘ride’    | [ɹaːd] | ‘right’   | [ɹaːt] | ‘rye’   | [ɹaj] |
| ‘aid’     | [eːd]  | ‘ate’     | [ɛt]   | ‘bay’   | [bej] |
| ‘lobe’    | [loːb] | ‘lope’    | [loːp] | ‘low’   | [low] |
| ‘teethe’  | [θiːð] | ‘teeth’   | [θiːθ] | ‘tea’   | [ti]  |
| ‘save’    | [seːv] | ‘safe’    | [sej]  | ‘say’   | [sej] |

- The phones that follow a long vowel.
  - [d] [b] [ð] [v] All are voiced!
Step 3: Look for Unique Environment

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See if any environments are unique to a particular allophone.

- Look at the corresponding environment for the other phone.
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| ‘ride’  | [ˌaːjd] | ‘right’ | [ˌaːjt] | ‘rye’  | [ˌaːj] |
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| ‘lobe’  | [loːwb] | ‘lope’  | [lowp]  | ‘low’  | [low] |
| ‘teethe’| [θiːd]  | ‘teeth’ | [θiθ]   | ‘tea’  | [ti]  |
| ‘save’  | [seːv]  | ‘safe’  | [seʃ]   | ‘say’  | [sej] |

- The phones that follow a long vowel.
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- The phones that follow a short vowel
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  - [d] [b] [ð] [v] All are voiced!
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  - [t] [p] [θ] [f] # None are voiced!

Only long vowels can precede voiced Cs!
Step 4: Write the Rule

Step 4:
If there’s an environment unique to one allophone, write the rule deriving that allophone in that environment.
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Remember our logic from earlier:

▶ If there’s an environment where you only find short vowels...
  ▶ ...then there’s a rule turning long vowels into short ones there.

▶ If there’s an environment where you only find long vowels...
  ▶ ...then there’s a rule turning short vowels into long ones there.

Rule of Thumb: If there are two allophones [X] and [Y], and only [X] appears in environment Z, the rule is: "/Y/ is pronounced as [X] in Z"
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Remember our logic from earlier:

- If there’s an environment where you only find short vowels...
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Rule of Thumb:
If there are two allophones [X] and [Y], and only [X] appears in environment Z, the rule is: “/Y/ is pronounced as [X] in Z”
**Step 4: Write the Rule**

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If there’s an environment unique to one allophone, write the rule deriving that allophone in that environment.

| ‘ride’  | [uə:jd] | ‘right’ | [uajt] | ‘rye’ | [uaj] |
| ‘aid’   | [eːjd]  | ‘ate’   | [ejt]  | ‘bay’  | [bej] |
| ‘lobe’  | [loːwb] | ‘lope’  | [lowp] | ‘low’  | [low] |
| ‘teethe’| [θiːd]  | ‘teeth’ | [θiθ]  | ‘tea’  | [ti]  |
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Only long vowels can precede voiced Cs!
Step 4: Write the Rule

Step 4:
If there’s an environment unique to one allophone, write the rule deriving that allophone in that environment.

- ‘ride’ [ua:jd]  
  ‘right’ [ua:jt]  
  ‘rye’ [ua:j]

- ‘aid’ [e:jd]  
  ‘ate’ [ejt]  
  ‘bay’ [bej]

- ‘lobe’ [lo:wb]  
  ‘lope’ [lowp]  
  ‘low’ [low]

- ‘teethe’ [θi:ð]  
  ‘teeth’ [θi:θ]  
  ‘tea’ [ti]

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  ‘safe’ [sejf]  
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‘aid’ [e:jd]  ‘ate’ [ejt]  ‘bay’ [bej]
‘save’ [se:ʃv]  ‘safe’ [seʃʃ]  ‘say’ [seʃ]

Only long vowels can precede voiced Cs!

Rule of Thumb:
If there are two allophones [X] and [Y], and only [X] appears in environment Z, the rule is: “/Y/ is pronounced as [X] in Z”

The Rule:
A short vowel is pronounced as a long vowel when preceding a voiced C.
The Question:
In English, are the long vowels and short vowels allophones of the same phoneme?

The Answer:
- They are allophones of the **same** phoneme (namely, short vowels)
- The phonological rule that relates them is the following: “In English, a short vowel is pronounced as a long vowel when preceding a voiced C.”
Conclusions

The Question:
In English, are the long vowels and short vowels allophones of the same phoneme?

The Answer:
- They are allophones of the same phoneme (namely, short vowels)
- The phonological rule that relates them is the following: “In English, a short vowel is pronounced as a long vowel when preceding a voiced C.”

If all this went by quickly for you, don’t worry. We’ll do several more examples together...
A Notation for Phonological Rules

There’s a handy notation linguists use to write phonological rules.
A Notation for Phonological Rules

There’s a handy notation linguists use to write phonological rules.

First Rule Template: /X/ → [Y]/ ___ A
“/X/ is pronounced as [Y] when preceding A”.

Example:
/V/ → [V]/Voiced-C
“A short V is pronounced as a long V when preceding a voiced C”.
A Notation for Phonological Rules

There's a handy notation linguists use to write phonological rules.

First Rule Template: \[ / X / \rightarrow [ Y ] / \_\_\_ A \]

"/X/ is pronounced as [Y] when preceding A".

Second Rule Template: \[ / X / \rightarrow [ Y ] / A \_\_\_ \]

"/X/ is pronounced as [Y] when following A".
A Notation for Phonological Rules

There’s a handy notation linguists use to write phonological rules.

First Rule Template: $/X/ \rightarrow [Y]/ \text{ ___ A}$
“/X/ is pronounced as [Y] when preceding A”.

Second Rule Template: $/X/ \rightarrow [Y]/ \text{ A ___}$
“/X/ is pronounced as [Y] when following A”.

Third Rule Template: $/X/ \rightarrow [Y]/ \text{ A ___ B}$
“/X/ is pronounced as [Y] when following A and preceding B.”
Deducing Allophonic Rules

Part 1

Supplementary Readings

Introduction and Review

The Logic of Phonemic Analysis

The Procedure for Finding Rules

The Notation for Rules

Summary

A Notation for Phonological Rules

There’s a handy notation linguists use to write phonological rules.

First Rule Template: \( /X/ \rightarrow [Y] / ___ A \)

“/X/ is pronounced as [Y] when preceding A”.

Second Rule Template: \( /X/ \rightarrow [Y] / A ___ \)

“/X/ is pronounced as [Y] when following A”.

Third Rule Template: \( /X/ \rightarrow [Y] / A ___ B \)

“/X/ is pronounced as [Y] when following A and preceding B.”

Example: \( /V/ \rightarrow [V\: ] / ___ Voiced-C \)

“A short V is pronounced as a long V when preceding a voiced C”
Summary

General Question:
Are [X] and [Y] allophones of the same phoneme?
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General Question:
Are [X] and [Y] allophones of the same phoneme?

▶ First Main Sub-Task:
Determine if there are minimal pairs for [X] and [Y].
  ▶ If there are, STOP!
    ▶ [X] and [Y] are allophones of different phonemes.
  ▶ If there aren’t, move on to Second Main Sub-Task.
General Question:
Are [X] and [Y] allophones of the same phoneme?

- Second Main Subtask:
  Determine if there is a rule deriving [X] and [Y] from the same phoneme.
Summary

General Question: Are [X] and [Y] allophones of the same phoneme?

- **Second Main Subtask:** Determine if there is a rule deriving [X] and [Y] from the same phoneme.
  - **Step 1:** Determine the environments of the two phones.
Summary

General Question:
Are [X] and [Y] allophones of the same phoneme?

▶ Second Main Subtask:
Determine if there is a rule deriving [X] and [Y] from the same phoneme.

▶ Step 1:
Determine the environments of the two phones.

▶ Step 2:
For each environment, look for similarities between the sounds.
Summary

General Question:
Are [X] and [Y] allophones of the same phoneme?

- **Second Main Subtask:**
  Determine if there is a rule deriving [X] and [Y] from the same phoneme.
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    Determine the environments of the two phones.
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    For each environment, look for similarities between the sounds.
  - **Step 3:**
    See if any environments are unique to a particular allophone.
General Question:
Are [X] and [Y] allophones of the same phoneme?

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