The Basics of Morphological Analysis
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Course Readings

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

▶ Contemporary Linguistics: Chapter 4 (pp. 143-146)
▶ Contemporary Linguistics: Morphophonemics Appendix
▶ Language Files: Chapter 4.5 (pp. 172-175)

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

▶ Language Instinct; Chapter 5 (119-152)
Fact From Five Weeks Ago:
The **phonology** of a language includes rules that affect the pronunciation of particular **phones**.

▶ **Example:**
/p/, /t/, /k/ in English are aspirated when they are the first sound in an onset.

Fact We Will Now Learn:
The **morphology** of a language includes rules that affect the pronunciation of particular **morphemes**.

▶ **Example:**
The past tense suffix /-d/ in English is pronounced as [-t] when preceding a voiceless C.
Fact From Last Unit:
In English, there is a suffix /-d/ that has the following properties:

- We write it as “-ed” (even though that’s not how it’s pronounced)
- It attaches to (most) verbs.
- It is inflectional.
- It means ‘past tense’ (the action happened in the past)

“buzz”  [bʌz]  “buzzed”  [bʌzd]
“sigh”  [saj]  “sighed”  [sajd]
“grab”  [ɡ्रæb]  “grabbed”  [ɡɾæbd]
“call”  [kɔl]  “called”  [kɔld]
“fan”  [fæn]  “fanned”  [fænd]
“save”  [sejv]  “saved”  [sejvəd]
Other Past Tense Morphology in English

Fact From Last Unit:
In English, some verbs form past tense via ‘internal change’ (ablaut).

<table>
<thead>
<tr>
<th>Verb</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>“see”</td>
<td>[si]</td>
</tr>
<tr>
<td>“know”</td>
<td>[nɔw]</td>
</tr>
<tr>
<td>“think”</td>
<td>[θiŋk]</td>
</tr>
<tr>
<td>“write”</td>
<td>[rəiʃt]</td>
</tr>
<tr>
<td>“sing”</td>
<td>[sɪŋ]</td>
</tr>
<tr>
<td>“give”</td>
<td>[gɪv]</td>
</tr>
<tr>
<td>“saw”</td>
<td>[sɔ]</td>
</tr>
<tr>
<td>“knew”</td>
<td>[nuː]</td>
</tr>
<tr>
<td>“thought”</td>
<td>[θət]</td>
</tr>
<tr>
<td>“wrote”</td>
<td>[rəʊt]</td>
</tr>
<tr>
<td>“sang”</td>
<td>[sæŋ]</td>
</tr>
<tr>
<td>“gave”</td>
<td>[geɪv]</td>
</tr>
</tbody>
</table>

This Rule is Different:
▶ Only some verbs form past tense in this way.
▶ New verbs never form their past tense this way (only with “-ed”).
▶ So, there isn’t really a (general) rule of ‘ablaut’ for English past-tense.
▶ For some ‘irregular’ verbs, we just have to memorize what their past-tense form is.
Other Past Tense Morphology in English

Fact From Last Unit:
In English, some verbs form past tense via ‘internal change’ (ablaut).

“see” [si]  “saw” [sɔ]
“know” [now]  “knew” [nu]
“think” [θiŋk]  “thought” [θɔt]
“write” [wajt]  “wrote” [rovt]
“sing” [sɪŋ]  “sang” [sæŋ]
“give” [ɡɪv]  “gave” [ɡeɪv]

This Rule is Different:
▶ Only some verbs form past tense in this way.
▶ New verbs never form their past tense this way (only with “-ed”).
Other Past Tense Morphology in English

Fact From Last Unit:
In English, some verbs form past tense via ‘internal change’ (ablaut).

“see” [si]  “saw” [sɔ]
“know” [now]  “knew” [nu]
“think” [θiŋk]  “thought” [θɔt]
“write” [riɪt]  “wrote” [rəʊt]
“sing” [siŋ]  “sang” [sæŋ]
“give” [ɡɪv]  “gave” [ɡɛv]

This Rule is Different:

► Only some verbs form past tense in this way.

► New verbs never form their past tense this way (only with “-ed”)
  ▶ So, there isn’t really a (general) rule of ‘ablaut’ for English past-tense.

► For some ‘irregular’ verbs, we do just have to memorize what their past-tense form is.
Towards Morphophonemics

Puzzling Fact 1:
In English, there is a suffix [-t] that has all the key properties of /-d/:

- We write it as “-ed” (even though that’s not how it’s pronounced)
- It attaches to (most) verbs.
- It is inflectional.
- It means ‘past tense’ (the action happened in the past)

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Inflected</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;bake&quot;</td>
<td>[bejk]</td>
<td>&quot;baked&quot;</td>
<td>[bejkt]</td>
</tr>
<tr>
<td>&quot;stuff&quot;</td>
<td>[stəf]</td>
<td>&quot;stuffed&quot;</td>
<td>[stəft]</td>
</tr>
<tr>
<td>&quot;jump&quot;</td>
<td>[dʒʌmp]</td>
<td>&quot;jumped&quot;</td>
<td>[dʒʌmpd]</td>
</tr>
<tr>
<td>&quot;kiss&quot;</td>
<td>[kɪs]</td>
<td>&quot;kissed&quot;</td>
<td>[kɪst]</td>
</tr>
<tr>
<td>&quot;wish&quot;</td>
<td>[wɪʃ]</td>
<td>&quot;wished&quot;</td>
<td>[wɪʃt]</td>
</tr>
<tr>
<td>&quot;froth&quot;</td>
<td>[froθ]</td>
<td>&quot;frothed&quot;</td>
<td>[froθt]</td>
</tr>
</tbody>
</table>
Towards Morphophonemics

Puzzling Fact 2:
In English, there is a suffix [-id] that has all the key properties of /-d/:

▶ We write it as “-ed” (even though that’s not how it’s pronounced)
▶ It attaches to (most) verbs.
▶ It is inflectional.
▶ It means ‘past tense’ (the action happened in the past)

“fold”      [fowld]
“bat”       [bæt]
“lift”      [lɪft]
“seed”      [sid]
“folded”    [fowldɪd]
“batted”    [bætɪd]
“lifted”    [lɪftɪd]
“seeded”    [sidɪd]
Towards Morphophonics

Puzzling Fact 2:
In English, there is a suffix [-id] that has all the key properties of /-d/:

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- It attaches to (most) verbs.
- It is inflectional.
- It means ‘past tense’ (the action happened in the past)

```
“fold”  [fowId]  “folded”  [fowIded]
“bat”   [bæt]   “batted”  [bætId]
“lift”  [lɪft]  “lifted”  [lɪftId]
“seed”  [sid]  “seeded”  [sidId]
```

Question:

- Are these past tense forms with ‘[-t]’ and ‘[-id]’ like the ones with ablaut?
- Do speakers just have to memorize whether a past tense verb has ‘[-t]’ or ‘[-id]’?
Towards Morphophonemics

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In English, there is a suffix [-id] that has all the key properties of /-d/:

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- It is inflectional.
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<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>“Folded”</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>fold</td>
<td>[fɔːld]</td>
<td>folded</td>
<td>[fɔːldɪd]</td>
</tr>
<tr>
<td>bat</td>
<td>[bæt]</td>
<td>batted</td>
<td>[bætɪd]</td>
</tr>
<tr>
<td>lift</td>
<td>[lɪft]</td>
<td>lifted</td>
<td>[lɪftɪd]</td>
</tr>
<tr>
<td>seed</td>
<td>[sɪd]</td>
<td>seeded</td>
<td>[sɪdɪd]</td>
</tr>
</tbody>
</table>

Answer: No!

- English speakers know which suffix to use for words they’ve never heard before!
Towards Morphophonemetics

Puzzling Fact 2:
In English, there is a suffix [-i\d] that has all the key properties of /-d/:

▶ We write it as “-ed” (even though that’s not how it’s pronounced)
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▶ It is inflectional.
▶ It means ‘past tense’ (the action happened in the past)

<table>
<thead>
<tr>
<th>“fold”</th>
<th>[fowl\d]</th>
<th>“folded”</th>
<th>[fowl\idd]</th>
</tr>
</thead>
<tbody>
<tr>
<td>“bat”</td>
<td>[bæt]</td>
<td>“batted”</td>
<td>[bæt\idd]</td>
</tr>
<tr>
<td>“lift”</td>
<td>[lɪft]</td>
<td>“lifted”</td>
<td>[lɪft\idd]</td>
</tr>
<tr>
<td>“seed”</td>
<td>[sid]</td>
<td>“seeded”</td>
<td>[sid\idd]</td>
</tr>
</tbody>
</table>

Answer: No!

▶ English speakers know which suffix to use for words they’ve never heard before!

“to slub” [sʌb] “slubbed”
Towards Morphophonemics

Puzzling Fact 2:
In English, there is a suffix [-ɪd] that has all the key properties of /-d/:

▶ We write it as “-ed” (even though that’s not how it’s pronounced)
▶ It attaches to (most) verbs.
▶ It is inflectional.
▶ It means ‘past tense’ (the action happened in the past)

“fold” [fəʊld] “folded” [fəʊldɪd]
“bat” [bæt] “batted” [bætɪd]
“lift” [lɪft] “lifted” [lɪftɪd]
“seed” [sɪd] “seeded” [sɪdɪd]

Answer: No!

▶ English speakers know which suffix to use for words they’ve never heard before!

“to slub” [slʌb] “slubbed” [slʌbd]
Towards Morphophonemics

Puzzling Fact 2:
In English, there is a suffix [-ɪd] that has all the key properties of /-d/:

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▶ It attaches to (most) verbs.
▶ It is inflectional.
▶ It means ‘past tense’ (the action happened in the past)

“fold” [fɔʊld]  “folded” [fɔʊldɪd]
“bat” [bæt]  “batted” [bætɪd]
“lift” [lɪft]  “lifted” [lɪftɪd]
“seed” [sɪd]  “seeded” [sɪdɪd]

Answer: No!

▶ English speakers know which suffix to use for words they’ve never heard before!

“to slub” [slʌb]  “slubbed” [slʌbd]
“to sluk” [slʌk]  “slukked”
Towards Morphophonemics

Puzzling Fact 2:
In English, there is a suffix [-ɪd] that has all the key properties of /-d/:
▶ We write it as “-ed” (even though that’s not how it’s pronounced)
▶ It attaches to (most) verbs.
▶ It is inflectional.
▶ It means ‘past tense’ (the action happened in the past)

“fold”  [fəʊld]  “folded”  [fəʊldɪd]
“bat”  [bæt]  “batted”  [bætdɪd]
“lift”  [lɪft]  “lifted”  [lɪfdɪd]
“seed”  [sid]  “seeded”  [sidɪd]

Answer:  No!
▶ English speakers know which suffix to use for words they’ve never heard before!

“to slub”  [slʌb]  “slubbed”  [slʌbd]
“to sluk”  [slʌk]  “slukked”  [slʌkt]
Towards Morphophonemics

Puzzling Fact 2: In English, there is a suffix [-id] that has all the key properties of /-d/:

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- It attaches to (most) verbs.
- It is inflectional.
- It means ‘past tense’ (the action happened in the past)

```
“fold” [fowld]  “folded” [fowldid]
“bat” [bæt]  “batted” [bætid]
“lift” [lɪft]  “lifted” [lɪtid]
“seed” [sid]  “seeded” [sidid]
```

Answer: No!

- English speakers know which suffix to use for words they’ve never heard before!

```
“to slub” [slʌb]  “slubbed” [slʌbd]
“to sluk” [slʌk]  “slukked” [slʌkt]
“to slud” [slʌd]  “sludded”
```
Towards Morphophonemics

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In English, there is a suffix [-id] that has all the key properties of /-d/:
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- It attaches to (most) verbs.
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- It means ‘past tense’ (the action happened in the past)

“fold” [fɔl-d] “folded” [fɔl-d-id]
“bat” [bæt] “batted” [bæt-id]
“lift” [lɪft] “lifted” [lɪft-id]
“seed” [sid] “seeded” [sid-id]

Answer: No!
- English speakers know which suffix to use for words they’ve never heard before!
Towards Morphophonemics

Puzzling Fact 2:
In English, there is a suffix [-\text{\textit{id}}] that has all the key properties of /-d/:

- We write it as “-ed” (even though that’s not how it’s pronounced)
- It attaches to (most) verbs.
- It is inflectional.
- It means ‘past tense’ (the action happened in the past)

“fold” [fowld]  “folded” [fowld\text{\textit{id}}]
“bat” [bæt]    “batted” [bæt\text{\textit{id}}]
“lift” [lɪft]  “lifted” [lɪft\text{\textit{id}}]
“seed” [sɪd]  “seeded” [sɪd\text{\textit{id}}]

Conclusion:
Whether a past-tense verb ends in [-d], [-t], [-\text{\textit{id}}] is determined by a **general rule**.
Morphemes and Allomorphs

Key Idea
There's a rule stating whether past-tense verbs end in [-d], [-t], [-id].
Morphemes and Allomorphs

Key Idea
There’s a **rule** stating whether past-tense verbs end in [-d], [-t], [-ɪd].

Further Observations:
These three suffixes have many properties in common:

▶ They attach to (most) verbs (including newly created ones)
▶ They are inflectional
▶ They mean ‘past tense’
▶ We write them as “-ed”
▶ They are all really similar in form
  ▶ They all end in an oral alveolar stop.
Morphemes and Allomorphs

Key Idea
There’s a **rule** stating whether past-tense verbs end in [-d], [-t], [-íd].

Further Observations:
These three suffixes have many properties in common:

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- They are inflectional
- They mean ‘past tense’
- We write them as “-ed”
- They are all really similar in form
  - They all end in an oral alveolar stop.

Another Key Idea:

- At some level, [-d], [-t], [-íd] are really the ‘same suffix’, /-d/
- There’s a **rule** stating when to pronounce /-d/ as [-d], [-t], [-íd]
Morphemes and Allomorphs

Key Ideas:

- At some level, [-d], [-t], [-ɪd] are really the ‘same suffix’, /-d/
- There’s a rule stating when to pronounce /-d/ as [-d], [-t], [-ɪd]
Morphemes and Allomorphs

Key Ideas:

- At some level, [-d], [-t], [-ɪd] are really the ‘same suffix’, /-d/
- There’s a rule stating when to pronounce /-d/ as [-d], [-t], [-ɪd]

Important Consequence:
Because of these kinds of rules, we need to distinguish:

- **Morpheme**: the affix as it is stored in memory (/-d/)  
- **Allomorph**: the affix as it is actually pronounced ([-d], [-t], [-ɪd])

Vocabulary:

**Morphophonemics** = The (study of) rules affecting the pronunciation of specific morphemes
Morphophonemic Analysis

Question:
How do we figure out the rule stating whether past-tense /-d/ is pronounced as [-d], [-t], [-id]?

Answer:
As with phonological rules, we can break down the process into a series of manageable steps...
Step 1: Get the Environments

Step 1:
Determine the environments of the allomorphs
Step 1: Get the Environments

Determine the environments of the allomorphs

- Since these are all suffixes, we will write up three lists:
  - The phones that precede the allomorph [-d]
  - The phones that precede the allomorph [-t]
  - The phones that precede the allomorph [-id]
### Step 1: Get the Environments

#### Illustrative Past-Tense Forms:

<table>
<thead>
<tr>
<th>[bæzd]</th>
<th>[bejkt]</th>
<th>[fowlid]</th>
</tr>
</thead>
<tbody>
<tr>
<td>[sajd]</td>
<td>[stəft]</td>
<td>[bætid]</td>
</tr>
<tr>
<td>[græbd]</td>
<td>[frʊt]</td>
<td>[lɪftid]</td>
</tr>
<tr>
<td>[kald]</td>
<td>[dʒɑmt]</td>
<td>[sidid]</td>
</tr>
<tr>
<td>[fænd]</td>
<td>[kist]</td>
<td></td>
</tr>
<tr>
<td>[sejvd]</td>
<td>[wiʃt]</td>
<td></td>
</tr>
</tbody>
</table>
Step 1: Get the Environments

Illustrative Past-Tense Forms:

\[[b\lazd] \quad [bejkt] \quad [fowlid\lzid]\n\[sajd] \quad [st\laf\lzt] \quad [baetid]\n\[g\lraeb\lzd] \quad [fr\lco\lzt] \quad [lif\lztid]\n\[ka\lzd] \quad [\ldg\lzm\lzt]\ \quad [sidid]\n\[f\lze\lnd]\ \quad [k\lzt]\n\[sejv\lzd]\ \quad [\lwift]\n
- The phones that precede the allomorph [-d]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

- \([b\acute{a}zd]\)  \([bejkt]\)  \([fow\acute{d}i\acute{d}]\)
- \([sajd]\)  \([st\acute{a}ft]\)  \([b\acute{ae}ti\acute{d}]\)
- \([gr\acute{ae}bd]\)  \([fr\acute{c}th]\)  \([li\acute{f}ti\acute{d}]\)
- \([kald]\)  \([gh\tilde{m}pt]\)  \([sidi\acute{d}]\)
- \([f\acute{a}nd]\)  \([kist]\)
- \([sejvd]\)  \([wif\acute{t}]\)

▶ The phones that precede the allomorph \([-d]\)
\(= [\acute{z}]\)
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bɔ zd] [bejk t] [fowlId]d
[saj d] [stəft] [bætιd]
[græbd] [frɔθt] [liftιd]
[kald] [dʒʌmp θ t] [sidιd]
[fænd] [kist] 
[sejv d] [wiʃ t]

► The phones that precede the allomorph [-d] [z] [aj]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bæzd]  [bejkt]  [fowldid]
[sajd]  [stɔft]  [bætid]
[græbd]  [ʃrɔt]  [liftid]
[kald]  [dʒɔmpt]  [sidid]
[fænd]  [kist]
[sejvd]  [wɪft]

▶ The phones that precede the allomorph [-d]
   [z] [aj] [b]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bæzd] [bejkkt] [fowldïd]
[sajd] [stתיב] [bætïd]
[græbd] [fυκθt] [lïftïd]
[kɔld] [dɤmpt] [sidïd]
[fænd] [kïst]
[sejvð] [wïfït]

► The phones that precede the allomorph [-d]
  [z] [aj] [b] [l]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bʌzd]  [bejkæt]  [fowldɪd]
[sajd]  [stʌft]  [bætɪd]
[græbd]  [fræθt]  [lɪftɪd]
[kɔld]  [dʒʌmt]  [sɪdɪd]
[fænd]  [kɪst]  
[sejvəd]  [wɪʃt]

▶ The phones that precede the allomorph [-d]
   [z] [aj] [b] [l] [n]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

- [bɔzd] [bejkɔt] [fɔwldið]
- [sajd] [stɔft] [bætɪd]
- [græbd] [frɔʊt] [lɪftɪd]
- [kɔld] [dʒʌmpt] [sidɪd]
- [fænd] [kɪst]
- [sejvd] [wɪft]

- The phones that precede the allomorph [-d]
  - [z] [aj] [b] [l] [n] [v]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bæzd]  [bejkt]  [fowldid]
[sajd]  [stfuft]  [bætid]
[græbd]  [f¿ct]  [liftid]
[kald]  [d¿mpf]  [sidid]
[fænd]  [kist]
[sejvd]  [wi[t]

▶ The phones that precede the allomorph [-d]
[z] [aj] [b] [l] [n] [v]

▶ The phones that precede the allomorph [-t]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

- [bæzd]  [bejkt]  [fowlidid]
- [sajd]  [stʌft]  [bætɪd]
- [græbd]  [frɛθt]  [lɪftɪd]
- [k ald]  [dʒʌmpτ]  [sidɪd]
- [fænd]  [kɪst]
- [sejvd]  [wɪʃt]

- The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v]
- The phones that precede the allomorph [-t]
  [k]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

- [bæzd] [bejkt] [fowlid]\text{d}
- [sajd] [stæk]\text{t} [bætid]
- [græbd] [fræθt] [lifid]
- [kald] [dʒæmp]\text{t} [sidid]
- [fænd] [kist]
- [sejvd] [wæt]

▶ The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v]

▶ The phones that precede the allomorph [-t]
  [k] [f]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

\[
\begin{array}{lll}
[kald] & [ɒμpt] & [sidåd] \\
[fænd] & [kist] & \\
[sejvd] & [wi[t] & \\
\end{array}
\]

- The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v]
- The phones that precede the allomorph [-t]
  [k] [f] [θ]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bæzd]  [bejkt]  [fowldiːd]
[sajd]  [stəft]  [baetid]
[græbd]  [furθt]  [liftid]
[kald]  [gʌmplt]  [sidid]
[fænd]  [kist]
[sejvd]  [wɪʃt]

▶ The phones that precede the allomorph [-d]
[z] [aj] [b] [l] [n] [v]

▶ The phones that precede the allomorph [-t]
[k] [f] [θ] [p]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bɔzd]  [bejkt]  [fowldiːd]
[sajd]  [stɔft]  [bætɪd]
[gɹæbd]  [frɔθt]  [lɪftɪd]
[kʌld]  [dʒʌmpt]  [sɪdɪd]
[fænd]  [kɪst]
[sejvð]  [wɪʃt]

▶ The phones that precede the allomorph [-d]
   [z] [aj] [b] [l] [n] [v]

▶ The phones that precede the allomorph [-t]
   [k] [f] [θ] [p] [s]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bəzd]  [bejkt]  [fowldɪd]
[sajd]  [stəft]  [bætɪd]
[ɡræbd]  [fɜɹt]  [lɪfɪd]
[kɔld]  [dʒʌmt]  [sɪdɪd]
[fɛnd]  [kɪst]
[sejvð]  [wiʃt]

▶ The phones that precede the allomorph [-d]
   [z] [aj] [b] [l] [n] [v]

▶ The phones that precede the allomorph [-t]
   [k] [f] [θ] [p] [s] [ʃ]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bæzd] [bejkt] [fowldιd]
[sajd] [stʌf t] [bætιd]
[græbd] [frɔθ t] [liftιd]
[kald] [dʒʌmp t] [sidιd]
[fænd] [kist]
[sejvd] [wɪʃ t]

▶ The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v]

▶ The phones that precede the allomorph [-t]
  [k] [f] [θ] [p] [s] [ʃ]

▶ The phones that precede the allomorph [-ιd]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

[bæzd]  [bejkt]  [fowldiːd]
[sajd]  [stʌft]  [bætɪd]
[ɡræbd]  [fɾcθt]  [lɪftɪd]
[kɔld]  [dʒʌmt]  [sidɪd]
[faend]  [kɪst]  
[sejvɔd]  [wɪʃt]

▶ The phones that precede the allomorph [-d]
    [z] [aj] [b] [l] [n] [v]

▶ The phones that precede the allomorph [-t]
    [k] [f] [θ] [p] [s] [ʃ]

▶ The phones that precede the allomorph [-ɪd]
    [d]
Step 1: Get the Environments

Illustrative Past-Tense Forms:

- [bæzd]  [bejkt]  [fowldıd]
- [sajd]  [stʃft]  [bætıd]
- [græbd]  [fruθt]  [lıftıd]
- [kald]  [dʒəmpt]  [sıdıd]
- [fænd]  [kist]
- [sevd]  [wıft]

- The phones that precede the allomorph [-d]  
  [z] [aj] [b] [l] [n] [v]

- The phones that precede the allomorph [-t]  
  [k] [f] [θ] [p] [s] [ʃ]

- The phones that precede the allomorph [-ıd]  
  [d] [t]
Step 2: Look for Similarities

Step 2: Look for Similarities
For each environment, look for similarities between the sounds.

Note:
For the purposes of this unit, consonants share nothing in common with vowels.
Step 2: Look for Similarities

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

- We want to write up three lists:
  - Similarities between the phones that precede the allomorph [-d]
  - Similarities between the phones that precede the allomorph [-t]
  - Similarities between the phones that precede the allomorph [-íd]

Note:
For the purposes of this unit, consonants share nothing in common with vowels.
Step 2: Look for Similarities

Illustrative Past-Tense Forms:

<table>
<thead>
<tr>
<th>[bazd]</th>
<th>[bejkt]</th>
<th>[fowldid]</th>
</tr>
</thead>
<tbody>
<tr>
<td>[sajd]</td>
<td>[staf]</td>
<td>[baetid]</td>
</tr>
<tr>
<td>[græbd]</td>
<td>[frcθt]</td>
<td>[lftid]</td>
</tr>
<tr>
<td>[kald]</td>
<td>[gʌmpt]</td>
<td>[sidid]</td>
</tr>
<tr>
<td>[fænd]</td>
<td>[kist]</td>
<td></td>
</tr>
<tr>
<td>[sejvd]</td>
<td>[wif]</td>
<td></td>
</tr>
</tbody>
</table>
Step 2: Look for Similarities

Illustrative Past-Tense Forms:

[bæzd] [bejkt] [fowldîd]
[sajd] [stʌft] [bætid]
[græbd] [frɔθt] [lîftîd]
[kɔld] [ɔŋmpt] [sidîd]
[fænd] [kist]
[sejvd] [wɪft]

▶ The phones that precede the allomorph [-d]
 [z] [aj] [b] [l] [n] [v]
Step 2: Look for Similarities

Illustrative Past-Tense Forms:

[bɔzɪ]  [bɛjkt]  [fɔwlɪd]
[sæjɪ]  [stʌft]  [bætɪd]
[ɡræbd]  [fɔɾθɛt]  [lɪftɪd]
[kɔld]  [dʒʌmpɪt]  [sidɪd]
[fænd]  [kɪst]
[sejvɪ]  [wɪʃt]

▶ The phones that precede the allomorph [-d]
[z] [aj] [b] [l] [n] [v]  Nothing in Common
**Step 2: Look for Similarities**

**Illustrative Past-Tense Forms:**

<table>
<thead>
<tr>
<th>Allomorph</th>
<th>Illustration</th>
<th>Allomorph</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>[-d]</td>
<td>[bʌzd]</td>
<td>[bejkt]</td>
<td>[fowldɪd]</td>
</tr>
<tr>
<td>[-t]</td>
<td>[sajd]</td>
<td>[stʌft]</td>
<td>[bætɪd]</td>
</tr>
<tr>
<td>[-l]</td>
<td>[græbd]</td>
<td>[fɜɾθt]</td>
<td>[lɪftɪd]</td>
</tr>
<tr>
<td>[-l]</td>
<td>[k ald]</td>
<td>[dʒʌmpt]</td>
<td>[sɪdɪd]</td>
</tr>
<tr>
<td>[-l]</td>
<td>[fænd]</td>
<td>[kɪst]</td>
<td></td>
</tr>
<tr>
<td>[-l]</td>
<td>[sejvд]</td>
<td>[wɪɲt]</td>
<td></td>
</tr>
</tbody>
</table>

- The phones that precede the allomorph [-d]:
  - [z] [æ] [b] [l] [n] [v]
  - Nothing in Common

- The phones that precede the allomorph [-t]:
  - [k] [f] [θ] [p] [s] [ʃ]
Step 2: Look for Similarities

Illustrative Past-Tense Forms:

[bʌzd]  [bejkt]  [fowldɪd]
[sajd]  [stʌft]  [bætɪd]
[ɡræbd]  [fɔtθt]  [lɪftɪd]
[kɔld]  [dʒʌmplt]  [sidɪd]
[fænd]  [kɪst]
[sejvθ]  [wɪt]

- The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v]  Nothing in Common

- The phones that precede the allomorph [-t]
  [k] [f] [θ] [p] [s] [ʃ]  All Voiceless!
Step 2: Look for Similarities

Illustrative Past-Tense Forms:

- [b\&zd] [bejkt] [fowl\&d]
- [sajd] [st\&ft] [b\&t\&d]
- [græbd] [frc\&t] [l\&ft\&d]
- [kald] [d\&mpt] [sid\&d]
- [fænd] [kist]  
- [sejvd] [wiff]

- The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v]  Nothing in Common

- The phones that precede the allomorph [-t]
  [k] [f] [\&] [p] [s] [j]  All Voiceless!

- The phones that precede the allomorph [-id]
  [d] [t]
Step 2: Look for Similarities

Illustrative Past-Tense Forms:

- [bʌzd] [bejkɪt] [fowldɪd]
- [sajd] [stʌft] [bætɪd]
- [ɡɹæbd] [fɹθt] [lɪftɪd]
- [kɔld] [dʒʌmpt] [sidɪd]
- [fænd] [kɪst]
- [sɛjvd] [wɪft]

- The phones that precede the allomorph [-d]
  - [z] [aj] [b] [l] [n] [v]  Nothing in Common
- The phones that precede the allomorph [-t]
  - [k] [f] [θ] [p] [s] [ʃ]  All Voiceless!
- The phones that precede the allomorph [-ɪd]
  - [d] [t]  All Oral Alveolar Stops!
Step 3: Identify the Morpheme

Step 3:

- There will always be (in this class) **one** environment where the phones share nothing in common.
- Choose that allomorph as the (underlying) morpheme.
Step 3: Identify the Morpheme

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- There will always be (in this class) **one** environment where the phones share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

Illustration:

- The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v]  **Nothing in Common**
- The phones that precede the allomorph [-t]
  [k] [f] [θ] [p] [s] [ʃ]  **All Voiceless!**
- The phones that precede the allomorph [-ɪd]
  [d] [t]  **All Oral Alveolar Stops!**
Step 3: Identify the Morpheme

There will always be (in this class) one environment where the phones share nothing in common.
Choose that allomorph as the (underlying) morpheme.

Illustration:

- The phones that precede the allomorph [-d]
  [z] [aj] [b] [l] [n] [v] Nothing in Common
- The phones that precede the allomorph [-t]
  [k] [f] [θ] [p] [s] [ʃ] All Voiceless!
- The phones that precede the allomorph [-ɪd]
  [d] [t] All Oral Alveolar Stops!

Result:
The allomorph ‘[-d]’ is the (underlying) morpheme /-d/.
Step 3: Identify the Morpheme

Step 3:

- There will always be (in this class) one environment where the phones share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

The Logic Behind This Step:

- Suppose [X] is an allomorph whose environment doesn’t have any unifying property...
Step 3: Identify the Morpheme

Step 3:

- There will always be (in this class) **one** environment where the phones share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

The Logic Behind This Step:

- Suppose \([X]\) is an allomorph whose environment doesn’t have any unifying property...
- If \([X]\) weren’t the (underlying) morpheme, then there’d have to be some rule like:
  - “The morpheme \(/Y/\) is pronounced as the allomorph \([X]\) in environment \(Z/\)"
Step 3: Identify the Morpheme

Step 3:

- There will always be (in this class) one environment where the phones share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

The Logic Behind This Step:

- Suppose [X] is an allomorph whose environment doesn’t have any unifying property...
- If [X] weren’t the (underlying) morpheme, then there’d have to be some rule like:
  - “The morpheme /Y/ is pronounced as the allomorph [X] in environment Z.”
- But what would the environment ‘Z’ in such a rule be?
  - The sounds in [X]’s environment don’t share anything in common.
Step 3: Identify the Morpheme

Step 3:

- There will always be (in this class) one environment where the phones share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

The Logic Behind This Step:

- Suppose [X] is an allomorph whose environment doesn’t have any unifying property...
- If [X] weren’t the (underlying) morpheme, then there’d have to be some rule like:
  - “The morpheme /Y/ is pronounced as the allomorph [X] in environment Z.”
- But what would the environment ‘Z’ in such a rule be?
  - The sounds in [X]’s environment don’t share anything in common.
- Therefore, there could not be a rule like the one above.
- Therefore, [X] itself must be the underlying morpheme, /X/
Step 4: Write the Rules

For the remaining allomorphs, write out the rules that would limit them to their observed environments.
Step 4: Write the Rules

Step 4:
For the remaining allomorphs, write out the rules that would limit them to their observed environments.

Rule of Thumb:
If allomorph [X] is found in environment Z, the rule to write is:
‘/Y/ → [X] / Z’
(Morpheme /Y/ is pronounced as allomorph [X] in environment Z)
Step 4: Write the Rules

Step 4:
For the remaining allomorphs, write out the rules that would limit them to their observed environments.

Rule of Thumb:
If allomorph [X] is found in environment Z, the rule to write is:

‘/Y/ → [X] / Z ’

(Morpheme /Y/ is pronounced as allomorph [X] in environment Z)

Illustration:
- The phones that precede the allomorph [-id]
  [d] [t] All Oral Alveolar Stops!
- The phones that precede the allomorph [-t]
  [k] [f] [θ] [p] [s] [ʃ] All Voiceless!
Step 4: Write the Rules

For the remaining allomorphs, write out the rules that would limit them to their observed environments.

Rule of Thumb:
If allomorph [X] is found in environment Z, the rule to write is:

`'/Y/ → [X] / Z'`

(Morpheme /Y/ is pronounced as allomorph [X] in environment Z)

Illustration:
▶ The phones that precede the allomorph [-id]
  [d] [t] All Oral Alveolar Stops!
▶ The phones that precede the allomorph [-t]
  [k] [f] [θ] [p] [s] [ʃ] All Voiceless!

Rule 1:  /-d/ → [-id] / Oral-Alveolar-Stop ___
Rule 2:  /-d/ → [-t] / Voiceless-C ___
Morphophonemics and Phonotactics

Morphophonemic Rules for English Past-Tense:

- Rule 1: /-d/ → [-ɪd] / Oral-Alveolar-Stop
- Rule 2: /-d/ → [-t] / Voiceless-C
Morphophonemics and Phonotactics

Morphophonemic Rules for English Past-Tense:

- **Rule 1:** /-d/ → [-i]d / Oral-Alveolar-Stop
- **Rule 2:** /-d/ → [-t] / Voiceless-C

**Important Fact:**
These rules ‘fix’ phonological problems created by suffixing /-d/.

- Suffixation of /-d/ sometimes makes a word that can’t be pronounced!
  - “bake” /bejk/ + /d/ = /bejkd/
    (PROBLEM: /kd/ is not a possible coda!)
  - “lift” /lIft/ + /d/ = /lIftd/
    (PROBLEM: /td/ is not a possible coda!)
The Basics of Morphological Analysis

Course Readings
Introducing Morphophonemics
Morphophonemic Analysis
Morphophonemics and Phonotactics
Practice: The Prefix ‘-/in/’
More Practice: Swedish Definite Suffixes
The Logic of Morphological Analysis

Morphophonemics and Phonotactics

Morphophonemic Rules for English Past-Tense:

▶ Rule 1:  /-d/ → [-i:d] / Oral-Alveolar-Stop ___
▶ Rule 2:  /-d/ → [-t] / Voiceless-C ___

Important Fact:
These rules ‘fix’ phonological problems created by suffixing /-d/.

▶ Suffixation of /-d/ sometimes makes a word that can’t be pronounced!

▶ “bake” /bejk/ + /d/ = /bejkd/ → [bejkt]
(SOLUTION: /kt/ is a possible coda!)

▶ “lift” /lIft/ + /d/ = /lIftd/ → [lIftid]
(SOLUTION: /t/ and /d/ are possible codas!)
Morphophonemics and Phonotactics

Morphophonemic Rules for English Past-Tense:

- **Rule 1**: /-d/ → [-iːd] / Oral-Alveolar-Stop
- **Rule 2**: /-d/ → [-t] / Voiceless-C

General Lesson:
Morphophonemic rules often exist to ‘fix’ phonological problems created by the morphology.

- Sometimes, morphology makes words that violate phonotactic constraints.
- Morphophonemic rules alter those words, making them consistent with phonotactics.
Morphophonemics and Phonotactics

Morphophonemic Rules for English Past-Tense:

- Rule 1: /-d/ → [-iːd] / Oral-Alveolar-Stop
- Rule 2: /-d/ → [-t] / Voiceless-C

General Lesson:
Morphophonemic rules often exist to ‘fix’ phonological problems created by the morphology.

- Sometimes, morphology makes words that violate phonotactic constraints.
- Morphophonemic rules alter those words, making them consistent with phonotactics.

But *sometimes*, morphophonemic rules have **nothing** to do with phonotactics...
Some Negative Prefixes in English

"attentive"  [ətɛntɪv]  "inattentive"  [ɪnətɛntɪv]
"hospitable"  [hɒspɪtɪbəl]  "inhospitable"  [ɪnhɒspɪtɪbəl]

"possible"  [pɒsəbl]  "impossible"  [ɪmpəsəbl]
"balanced"  [bælənst]  "imbalanced"  [ɪmbælənst]

"complete"  [kəmplɪt]  "incomplete"  [ɪŋkəmplɪt]
"glorious"  [ɡlɔːriəs]  "inglorious"  [ɪŋɡlɔːriəs]

Observations:

- The words on the right look like those on the left, except that they begin with:  [ɪn-], [ɪm-], [ɪŋ-]
- The words on the right are the ‘opposites’ of the words on the left (Each prefix means ‘not’)
Some Negative Prefixes in English

“attentive”  [əˈtɛntɪv]  “inattentive”  [ɪnəˈtɛntɪv]
“hospitable”  [hɒsˈpɪtəbəl]  “inhospitable”  [ɪnˈhɒsptəbəl]

“possible”  [pəˈsəbl]  “impossible”  [ɪmˈpəsəbl]
“balanced”  [ˈbælənst]  “imbalanced”  [ɪmˈbælənst]

“complete”  [kəmplɪt]  “incomplete”  [ɪnˈkəmplɪt]
“glorious”  [ˈɡlɔrɪəs]  “inglorious”  [ˈɪŋɡlɔrɪəs]

Question:
Do we really see *three* different prefixes in the words above?

▸ Each prefix has a very similar form:
  ▸ Begins with [ɪ]
  ▸ Ends with a nasal stop: [n], [m], [ŋ]
▸ Each prefix has the same meaning (i.e., ‘not A’)

The Basics of Morphological Analysis

Course Readings
Introducing Morphophonemics
Morphophonemic Analysis
Morphophonemics and Phonotactics
Practice: The Prefix ‘-/ɪn/’
  Step 1: Determine the Environments
  Step 2: Look for Similarities
  Step 3: Identify the Morpheme
  Step 4: Write the Rules

More Practice: Swedish Definite Suffixes

The Logic of Morphological Analysis
Some Negative Prefixes in English

“attentive” [ətɛntɪv] “inattentive” [ɪnətɛntɪv]
“hospitable” [hɒspɪtəbəl] “inhospitable” [ɪnhɒspɪtəbəl]

“possible” [pɒsəbəl] “impossible” [ɪmpɒsəbəl]
“balanced” [ˈbælənst] “imbalanced” [ˈɪmbælənst]

“complete” [kɒmplɪt] “incomplete” [ɪŋkɒmplɪt]
“glorious” [ˈɡlɔːriəs] “inglorious” [ɪŋˈɡlɔːriəs]

Idea:
Let’s apply the steps of ‘morphophonemic’ analysis, to see if we can relate these allomorphs to the same morpheme!
Step 1: Determine the Environments

Step 1: Determine the Environments

“attentive” [ætəntɪv]  “inattentive” [ɪnætəntɪv]
“hospitable” [haʊspɪtəbəl]  “inhospitable” [ɪnhaʊspɪtəbəl]

“possible” [pəsəbl]  “impossible” [ɪmpəsəbl]
“balanced” [bælənst]  “imbalanced” [ɪmbaɪlənst]

“complete” [kəmplɪt]  “incomplete” [ɪŋkəmplɪt]
“glorious” [ɡlɔrɪəs]  “inglorious” [ɪŋɡlɔrɪəs]

▶ Phones that follow [ɪn-]:

Step 2: Look for Similarities
Step 3: Identify the Morpheme
Step 4: Write the Rules
Step 1: Determine the Environments

“attentive” [ətɛntɪv] “inattentive” [ɪnətɛntɪv]
“hospitable” [hɒspɪtɪbəl] “inhospitable” [ɪnhɒspɪtɪbəl]

“possible” [pɒsəbl] “impossible” [ɪmposəbl]
“balanced” [bælənst] “imbalance” [ɪmbælənst]

“complete” [kəmplɪt] “incomplete” [ɪnkəmplɪt]
“glorious” [ɡlɔrɪəs] “inglorious” [ɪŋɡlɔrɪəs]

► Phones that follow [ɪn-]: [ʌ],
Step 1: Determine the Environments

“attentive” [ətɛntɪv] “inattentive” [ɪnətɛntɪv]
“hospitable” [hæspɪtəˈbɛl] “inhospitable” [ɪnhæspɪtəˈbɛl]

“possible” [pəsəb] “impossible” [ɪmpəsəb]
“balanced” [ˈbælənst] “imbalance” [ˈɪmbælənst]

“complete” [kəmplɪt] “incomplete” [ɪnˈkəmplɪt]
“glorious” [ˈɡlɔrɪəs] “inglorious” [ˈɪŋɡlɔrɪəs]

Phones that follow [ɪn-]: [ʌ], [h]
Step 1: Determine the Environments

“attentive”  [əˈtɛntɪv]  “inattentive”  [ɪnəˈtɛntɪv]
“hospitable”  [ˈhɒspɪtəbəl]  “inhospitable”  [ɪnˈhɒspɪtəbəl]
“possible”  [pəsəbl]  “impossible”  [ɪmˈpəsəbl]
“balanced”  [ˈbælənst]  “imbalanced”  [ɪmˈbælənst]
“complete”  [kəmˈplət]  “incomplete”  [ɪnˈkəmˈplət]
“glorious”  [ˈɡlɔːriəs]  “inglorious”  [ɪŋˈɡlɔːriəs]

▶ Phones that follow [ɪn-]:  [ʌ], [h]
▶ Phones that follow [ɪm-]:
Step 1: Determine the Environments

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
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<td>attentive</td>
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<tr>
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<td>[ɪŋkəmplɪt]</td>
</tr>
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<td>[ɡlɔrɪəs]</td>
<td>inglorious</td>
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</table>

- Phones that follow [ɪn-]: [ʌ], [h]
- Phones that follow [ɪm-]: [p],
Step 1: Determine the Environments

“attentive” [ətəntiv] “inattentive” [ɪnətəntiv]
“hospitable” [hæspɪtəbəl] “inhospitable” [ɪnhæspɪtəbəl]

“possible” [pəsəbəl] “impossible” [ɪmpəsəbəl]
“balanced” [bælənst] “imbalanced” [ɪmbælənst]

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▶ Phones that follow [ɪn-]: [ʌ], [h]
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### Step 1: Determine the Environments

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Step 1: Determine the Environments

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- Phones that follow [ɪn-]: [ʌ], [h]
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### Step 2: Look for Similarities

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Step 2: Look for Similarities

“attentive” [ətɛntɪv] “inattentive” [ɪnətɛntɪv]
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▶ Phones that follow [ɪn-]: [ʌ], [h] Nothing in Common
### Step 2: Look for Similarities

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- Phones that follow [ɪn-]: [æ], [h]  **Nothing in Common**
- Phones that follow [ɪm-]: [p], [b]
Step 2: Look for Similarities

- “attentive” [ʌtəntɪv]  “inattentive” [ɪnʌtəntɪv]
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- Phones that follow [ɪn-]: [ʌ], [h]  **Nothing in Common**
- Phones that follow [ɪm-]: [p], [b]  **Bilabial Oral Stops**

- The Basics of Morphological Analysis
- Course Readings
  - Introducing Morphophonemics
  - Morphophonemic Analysis
  - Morphophonemics and Phonotactics
- Practice: The Prefix ‘-/in/’
  - Step 1: Determine the Environments
  - Step 2: Look for Similarities
  - Step 3: Identify the Morpheme
  - Step 4: Write the Rules
- More Practice: Swedish Definite Suffixes
- The Logic of Morphological Analysis
Step 2: Look for Similarities

“attentive” [ˈætɛntɪv] “inattentive” [ɪnˈætɛntɪv]
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“possible” [ˈpɒsəbl] “impossible” [ɪmˈpɒsəbl]
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“complete” [kəmˈplɪt] “incomplete” [ɪnˈkɒmplɪt]
“glorious” [ˈɡlɒriəs] “inglorious” [ɪnˈɡlɒriəs]

- Phones that follow [ɪn-]: [ʌ], [h] Nothing in Common
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- Phones that follow [ɪŋ-]: [k], [ɡ]
### Step 2: Look for Similarities

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- **Phones that follow** [ɪn-]: [ʊ], [h]  
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- **Phones that follow** [ɪm-]: [p], [b]  
  **Bilabial Oral Stops**
- **Phones that follow** [ɪŋ-]: [k], [ɡ]  
  **Velar Oral Stops**
Step 3: Identify the Morpheme

- “attentive” [ətɛntɪv] “inattentive” [ɪnətɛntɪv]
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Step 3:
- Find the allomorph such that the sounds in its environment share nothing in common.
- Choose that allomorph as the (underlying) morpheme.
Step 3: Identify the Morpheme

Find the allomorph such that the sounds in its environment share nothing in common. Choose that allomorph as the (underlying) morpheme.

Environments of the Allomorphs:

- Phones that follow [ɪn-]: [ʌ], [h] Nothing in Common
- Phones that follow [ɪm-]: [p], [b] Bilabial Oral Stops
- Phones that follow [ɪŋ-]: [k], [ɡ] Velar Oral Stops
Step 3: Identify the Morpheme

- "attentive" [ʌtɛntɪv]  "inattentive" [ɪnʌtɛntɪv]
- "hospitable" [hæspɪtɪbəl]  "inhospitable" [ɪnhæspɪtɪbəl]
- "possible" [pɑsəbl]  "impossible" [ɪmpɑsəbl]
- "balanced" [bælənst]  "imbalance" [ɪmbælənst]
- "complete" [kəmplɪt]  "incomplete" [ɪŋkəmplɪt]
- "glorious" [ɡlɔrɪəs]  "inglorious" [ɪŋɡlɔrɪəs]

Step 3:
- Find the allomorph such that the sounds in its environment share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

Environments of the Allomorphs:
- Phones that follow [ɪn-]: [ʌ], [h]  Nothing in Common
## Step 3: Identify the Morpheme

<table>
<thead>
<tr>
<th>Word</th>
<th>Allomorph</th>
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### Step 3:
- Find the allomorph such that the sounds in its environment share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

### Environments of the Allomorphs:
- Phones that follow [ɪn-]: [ʌ], [h]  
  **Nothing in Common**

### Conclusion:
The underlying morpheme is /ɪn-/
Step 4: Write the Rules

For the remaining allomorphs, write out the rules that would limit them to their observed environments.

Rule of Thumb:
If allomorph [X] is found in environment Z, the rule to write is:
‘/Y/ → [X] / Z’
### Step 4: Write the Rules

| “attentive” | [ətɛntɪv] | “inattentive” | [ɪnætɛntɪv] |
| “hospitable” | [hæspɪtɪbəl] | “inhospitable” | [ɪnhæspɪtɪbəl] |
| “possible” | [pəsəbəl] | “impossible” | [ɪmpəsəbəl] |
| “balanced” | [bælənst] | “imbalance” | [ɪmbælənst] |
| “complete” | [kəmplɪt] | “incomplete” | [ɪŋkəmplɪt] |
| “glorious” | [ɡlɔrɪəs] | “inglorious” | [ɪŋɡlɔrɪəs] |

**Rule of Thumb:**
If allomorph [X] is found in environment Z, the rule to write is:

´/Y/ → [X] / Z´

### Environments for Remaining Allomorphs:

- **Phones that follow [ɪm-]:** [p], [b]  
  **Bilabial Oral Stops**
- **Phones that follow [ɪŋ-]:** [k], [ɡ]  
  **Velar Oral Stops**
Step 4: Write the Rules

For the remaining allomorphs, write out the rules that would limit them to their observed environments.

Rule of Thumb:
If allomorph [X] is found in environment Z, the rule to write is:
‘/Y/ → [X] / Z’

Environments for Remaining Allomorphs:

- /ɪn-/ → [ɪm] / _____ Biliabial-Oral-Stop
- Phones that follow [ɪŋ-]: [k], [ɡ]  Velar Oral Stops
Step 4: Write the Rules

For the remaining allomorphs, write out the rules that would limit them to their observed environments.

Rule of Thumb:
If allomorph [X] is found in environment Z, the rule to write is:

‘/Y/ → [X] / Z ’

Environments for Remaining Allomorphs:

- /in- → [im] / _____ Biliabial-Oral-Stop
- /in- → [iŋ] / _____ Velar-Oral-Stop
Morphophonemics and Phonotactics

Morphophonemic Rules for /ɪn-/:

- /ɪn-/ → [ɪm] / Biliabial-Oral-Stop
- /ɪn-/ → [ɪŋ] / Velar-Oral-Stop

Observation:
- Unlike the rules for past-tense, these rules don’t serve to ‘fix’ phonotactic violations.
- Even if the rules didn’t apply, we could still pronounce the words.

*inpossible
*incompatible

Conclusion:
- Some morphophonemic rules aren’t there to fix phonotactic violations
- (They’re there ‘just because’)
Morphophonemematics and Phonotactics

Morphophonemic Rules for /ɪn-/:

▶ /ɪn-/ → [ɪm] / _____ Biliabial-Oral-Stop
▶ /ɪn-/ → [ɪŋ] / _____ Velar-Oral-Stop

Observation:

▶ Unlike the rules for past-tense, these rules don’t serve to ‘fix’ phonotactic violations.
▶ Even if the rules didn’t apply, we could still pronounce the words.

*inpossible  [ɪpəsɪbl]   (unpopular   [ʌnpəpjuːlɪŋ])
*incompatible  [ɪnkəmpətəbl]   (uncaring   [ʌnkəˈdʒiŋ])

Conclusion:

▶ Some morphophonemic rules aren’t there to fix phonotactic violations
▶ (They’re there ‘just because’)
Let’s do one last morphophonemic problem together, just to practice this all one last time.

This problem will contain an extra ‘difficulty’ that you won’t find on the problems you’ll be assigned.
Definite Suffixes in Swedish

Consider the following pairs of words from Swedish:

| [stol] | ‘chair’ | [stolen] | ‘the chair’ |
| [kat] | ‘cat’ | [katen] | ‘the chair’ |
| [tidniŋ] | ‘newspaper’ | [tidniŋen] | ‘the newspaper’ |
| [lampa] | ‘lamp’ | [lampan] | ‘the lamp’ |
| [sofa] | ‘sofa’ | [sofan] | ‘the sofa’ |
| [katar] | ‘cats’ | [katarna] | ‘the cats’ |
| [bilar] | ‘cars’ | [bilarna] | ‘the cars’ |
| [stolar] | ‘chairs’ | [stolarna] | ‘the chairs’ |

Observations:
▶ The words on the right look just like those on the left, except they end in [-en], [-n], [-na].
▶ The words on the right mean “the” + the word on the left.
▶ (All three suffixes seem to mean ‘the’).
Definite Suffixes in Swedish

Consider the following pairs of words from Swedish:

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<tr>
<th>Word</th>
<th>Meaning</th>
<th>Word</th>
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<tbody>
<tr>
<td>[stol]</td>
<td>‘chair’</td>
<td>[stolen]</td>
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</tbody>
</table>

Observations:

- The words on the right look just like those on the left, except they end in [-en], [-n], [-na]
- The words on the right mean “the” + the word on the left
- (All three suffixes seem to mean ‘the’)

The Basics of Morphological Analysis

Course Readings
Introducing
Morphophonemics
Morphophonemic Analysis
Morphophonemics and Phonotactics
Practice: The Prefix ‘-/in/’
More Practice: Swedish Definite Suffixes
  Step 1: Determine the Environments
  Step 2: Look for Similarities
  Step 3: Identify the Morpheme
  Step 4: Write the Rules

The Logic of Morphological Analysis
## Definite Suffixes in Swedish

Consider the following pairs of words from Swedish:

<table>
<thead>
<tr>
<th>Swedish Word</th>
<th>Pronunciation</th>
<th>Swedish Definite Suffixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>[stol]</td>
<td>‘chair’</td>
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<tr>
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</table>

### Question:
- Does Swedish really have three different suffixes meaning ‘the’?
- Or, can we relate these as allomorphs of the same morpheme?
### Step 1: Determine the Environments

<table>
<thead>
<tr>
<th>Word</th>
<th>Environment 1</th>
<th>Environment 2</th>
<th>Environment 3</th>
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Step 1: Determine the Environments

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▶ Phones that precede [-en]:

- [l]
- [t]
- [N]
## Step 1: Determine the Environments

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- Phones that precede [-en]: [l]
Step 1: Determine the Environments

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- Phones that precede [-en]: [l] [t]
## Step 1: Determine the Environments

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- Phones that precede [-en]: [l] [t] [ŋ]
### Step 1: Determine the Environments

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- Phones that precede [-en]: [l] [t] [ŋ]
- Phones that precede [-n]:
### Step 1: Determine the Environments

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- Phones that precede [-en]: [l] [t] [ƞ]
- Phones that precede [-n]: [a]
Step 1: Determine the Environments

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- Phones that precede [-en]: [l] [t] [ŋ]
- Phones that precede [-n]: [a]
- Phones that precede [-na]:
### Step 1: Determine the Environments

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- **Phones that precede [-en]:** [l] [t] [ŋ]
- **Phones that precede [-n]:** [a]
- **Phones that precede [-na]:** [r]
### Step 2: Look for Similarities

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
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<th>Word</th>
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- **Phones that precede** [-en]: [l] [t] [N] 
  - All are consonants
- **Phones that precede** [-n]: [a] 
  - All are [a]
- **Phones that precede** [-na]: [r] 
  - All are [r]
Step 2: Look for Similarities

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- Phones that precede [-en]: [l] [t] [ŋ]
Step 2: Look for Similarities

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<td>[-an]</td>
<td>[lampan]</td>
</tr>
<tr>
<td>[sofa]</td>
<td>‘sofa’</td>
<td>[-an]</td>
<td>[sofan]</td>
</tr>
<tr>
<td>[katar]</td>
<td>‘cats’</td>
<td>[-na]</td>
<td>[katarna]</td>
</tr>
<tr>
<td>[bilar]</td>
<td>‘cars’</td>
<td>[-na]</td>
<td>[bilarna]</td>
</tr>
<tr>
<td>[stolar]</td>
<td>‘chairs’</td>
<td>[-na]</td>
<td>[stolarna]</td>
</tr>
</tbody>
</table>

Phones that precede [-en]: [l] [t] [ŋ]  All are consonants
Step 2: Look for Similarities

- [stol] ‘chair’  [stolen] ‘the chair’
- [kat] ‘cat’  [katen] ‘the chair’
- [tidniŋ] ‘newspaper’  [tidniŋen] ‘the newspaper’
- [lampa] ‘lamp’  [lampan] ‘the lamp’
- [sofa] ‘sofa’  [sofan] ‘the sofa’
- [katar] ‘cats’  [katar na] ‘the cats’
- [bilar] ‘cars’  [bilar na] ‘the cars’
- [stolar] ‘chairs’  [stolar na] ‘the chairs’

- Phones that precede [-en]: [l] [t] [ŋ] All are consonants
- Phones that precede [-n]: [a]
## Step 2: Look for Similarities

<table>
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<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Transcription</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>[stol]</td>
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- Phones that precede [-en]: [l] [t] [ŋ] All are consonants
- Phones that precede [-n]: [a] All are [a]
Step 2: Look for Similarities

- [stol] ‘chair’ [stolen] ‘the chair’
- [kat] ‘cat’ [katen] ‘the chair’
- [tidniŋ] ‘newspaper’ [tidniŋen] ‘the newspaper’
- [lampa] ‘lamp’ [lampan] ‘the lamp’
- [sofa] ‘sofa’ [sofan] ‘the sofa’
- [katar] ‘cats’ [katarna] ‘the cats’
- [bilar] ‘cars’ [bilarña] ‘the cars’
- [stolar] ‘chairs’ [stolarna] ‘the chairs’

- Phones that precede [-en]: [l] [t] [ŋ] All are consonants
- Phones that precede [-n]: [a] All are [a]
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Step 2: Look for Similarities

- **Phones that precede [-en]:** [l] [t] [ŋ]  
  All are consonants
- **Phones that precede [-n]:** [a]  
  All are [a]
- **Phones that precede [-na]:** [r]  
  All are [r]
Step 3: Identify the Morpheme

<table>
<thead>
<tr>
<th>Allomorph</th>
<th>‘Chair’</th>
<th>Allomorph</th>
<th>‘The Chair’</th>
</tr>
</thead>
<tbody>
<tr>
<td>[stol]</td>
<td>‘chair’</td>
<td>[stolen]</td>
<td>‘the chair’</td>
</tr>
<tr>
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<td>‘the chair’</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allomorph</th>
<th>‘Lamp’</th>
<th>Allomorph</th>
<th>‘The Lamp’</th>
</tr>
</thead>
<tbody>
<tr>
<td>[lampa]</td>
<td>‘lamp’</td>
<td>[lampan]</td>
<td>‘the lamp’</td>
</tr>
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<td>[sofa]</td>
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<td>[sofan]</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Allomorph</th>
<th>‘Cats’</th>
<th>Allomorph</th>
<th>‘The Cats’</th>
</tr>
</thead>
<tbody>
<tr>
<td>[katar]</td>
<td>‘cats’</td>
<td>[katar na]</td>
<td>‘the cats’</td>
</tr>
<tr>
<td>[bilar]</td>
<td>‘cars’</td>
<td>[bilar na]</td>
<td>‘the cars’</td>
</tr>
<tr>
<td>[stolar]</td>
<td>‘chairs’</td>
<td>[stolar na]</td>
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</tr>
</tbody>
</table>

Step 3:

- Find the allomorph such that the sounds in its environment share nothing in common.
- Choose that allomorph as the (underlying) morpheme.
Step 3: Identify the Morpheme

<table>
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<tr>
<th>Word</th>
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Step 3:
- Find the allomorph such that the sounds in its environment share nothing in common.
- Choose that allomorph as the (underlying) morpheme.

Environments of the Allomorphs:
- Phones that precede [-en]: [l] [t] [ŋ] All are consonants
- Phones that precede [-n]: [a] All are [a]
- Phones that precede [-na]: [r] All are [r]
### Step 3: Identify the Morpheme

| [stol]  | ‘chair’               | [stolen] | ‘the chair’  |
| [kat]   | ‘cat’                 | [katen]  | ‘the chair’  |
| [tidniŋ] | ‘newspaper’          | [tidniŋen] | ‘the newspaper’ |

| [lampa] | ‘lamp’               | [lampan] | ‘the lamp’  |
| [sofa]  | ‘sofa’               | [sofan]  | ‘the sofa’  |

| [katar] | ‘cats’               | [katarña] | ‘the cats’ |
| [bilar] | ‘cars’               | [bilarña] | ‘the cars’ |
| [stolar] | ‘chairs’            | [stolarña] | ‘the chairs’ |

### Step 3.5 (You Won’t Have to Do This):
- If there is no such allomorph...
- If *all* the environments have *something* in common.
- Choose the allomorph with the *least specific environment*

### Environments of the Allomorphs:
- Phones that precede [-en]: [l] [t] [ŋ]  
  **All are consonants**
- Phones that precede [-n]: [a]  
  **All are [a]**
- Phones that precede [-na]: [r]  
  **All are [r]**
Step 3: Identify the Morpheme

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Step 3.5 (You Won’t Have to Do This):

- If there is no such allomorph...
- If all the environments have *something* in common.
- Choose the allomorph with the least specific environment

Environments of the Allomorphs:

- Phones that precede [-en]: [l] [t] [ŋ] All are consonants
Step 3: Identify the Morpheme

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Step 3.5 (You Won’t Have to Do This):

- If there is no such allomorph...
- If *all* the environments have *something* in common.
- Choose the allomorph with the *least specific environment*

Environments of the Allomorphs:

- Phones that precede [-en]: [l] [t] [ŋ]  
  *All are consonants*

Conclusion: The underlying morpheme is */-en/*
### Step 4: Write the Rules

<table>
<thead>
<tr>
<th>Word</th>
<th>Allomorph</th>
<th>Meaning</th>
<th>Rule Formulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[stol] 'chair'</td>
<td>[stolen]</td>
<td>'the chair'</td>
<td>'/Y/ → [X] / Z'</td>
</tr>
<tr>
<td>[kat] 'cat'</td>
<td>[katen]</td>
<td>'the chair'</td>
<td>'/Y/ → [X] / Z'</td>
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<td>[tidniŋ] 'newspaper'</td>
<td>[tidniŋen]</td>
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<td>'/Y/ → [X] / Z'</td>
</tr>
<tr>
<td>[lampa] 'lamp'</td>
<td>[lampan]</td>
<td>'the lamp'</td>
<td>'/Y/ → [X] / Z'</td>
</tr>
<tr>
<td>[sofa] 'sofa'</td>
<td>[sofan]</td>
<td>'the sofa'</td>
<td>'/Y/ → [X] / Z'</td>
</tr>
<tr>
<td>[katar] 'cats'</td>
<td>[katarna]</td>
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**Step 4:**
For the remaining allomorphs, write out the rules that would limit them to their observed environments.

**Rule of Thumb:**
If allomorph [X] is found in environment Z, the rule to write is:

‘/Y/ → [X] / Z’
## Step 4: Write the Rules

<table>
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</table>

### Rule of Thumb:

If allomorph [X] is found in environment Z, the rule to write is:

‘/Y/ → [X] / Z’

### Environments for Remaining Allomorphs:

- Phones that precede [-n]: [a]  
  All are [a]
- Phones that precede [-na]: [r]  
  All are [r]
### The Basics of Morphological Analysis

#### Course Readings
- Introducing Morphophonemics
- Morphophonemic Analysis
- Morphophonemics and Phonotactics
- Practice: The Prefix ‘-en’
- More Practice: Swedish Definite Suffixes

#### The Logic of Morphological Analysis

<table>
<thead>
<tr>
<th>Allomorph</th>
<th>Token</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[stol]</td>
<td>‘chair’</td>
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<tr>
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<td>‘cat’</td>
<td>[katen] ‘the chair’</td>
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<td>‘newspaper’</td>
<td>[tidniɲen] ‘the newspaper’</td>
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<td>‘chairs’</td>
<td>[stolarə] ‘the chairs’</td>
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### Step 4: Write the Rules

For the remaining allomorphs, write out the rules that would limit them to their observed environments.

**Rule of Thumb:**
If allomorph $[X]$ is found in environment $Z$, the rule to write is:

\[ /Y/ \rightarrow [X] / Z \]

**Environments for Remaining Allomorphs:**

- $/-en/ \rightarrow [-n] / [a]$ ---
- Phones that precede $[-na]$: $[r]$ All are $[r]$
Step 4: Write the Rules

For the remaining allomorphs, write out the rules that would limit them to their observed environments.

**Rule of Thumb:**
If allomorph [X] is found in environment Z, the rule to write is:
‘/Y/ → [X] / Z’

**Environments for Remaining Allomorphs:**

- /-en/ → [-n] / [a] ___
- /-en/ → [-na] / [r] ___
Conclusion: The Swedish Definite Suffix

Question:

▶ Does Swedish really have three different suffixes meaning ‘the’?
▶ Or, can we relate these as allomorphs of the same morpheme?
Conclusion: The Swedish Definite Suffix

Question:
- Does Swedish really have three different suffixes meaning ‘the’?
- Or, can we relate these as allomorphs of the same morpheme?

Answer:
- Swedish only has one suffix meaning ‘the’.
- This suffix is /-en/.
- This suffix undergoes the following morphophonemic rules, which affect the way it ends up being pronounced:
  - /-en/ → [-n] / [a] 
  - /-en/ → [-na] / [r] 

Having gone through these examples, you now have the tools for doing morphophonemic analysis on your own!
Conclusion: The Swedish Definite Suffix

Question:

▶ Does Swedish really have three different suffixes meaning ‘the’?
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Answer:

▶ Swedish only has one suffix meaning ‘the’.
▶ This suffix is /-en/.
▶ This suffix undergoes the following morphophonemic rules, which affect the way it ends up being pronounced:
  ▶ /-en/ → [-n] / [a] ______
  ▶ /-en/ → [-na] / [r] ______

Having gone through these examples, you now have the tools for doing morphophonemic analysis on your own!
Finally, let’s also make clear the procedure for determining what allomorphs a language has, and what they mean.

This procedure gets a little challenging when a language has a lot of affixes it can use to make complex words.
Complex Words in Turkish

Consider the following words from Turkish:

- [denizdzikde] ‘in a little ocean’
- [evdzikden] ‘from a little house’
- [eve] ‘to a house’
- [elim] ‘my hand’
- [diʃler] ‘teeth’

Observation:
Turkish can express in one word what English does in many words.
Complex Words in Turkish

Consider the following words from Turkish:

- [denizdzikde]: ‘in a little ocean’
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Observation:
Turkish can express in one word what English does in many words.

Reasonable Guess:
- Maybe some of these words contain a bunch of affixes?
- Maybe that’s how they get so long and get such ‘big’ meanings? (like ‘antidisestablishmentarianism’ in English)

Question: How do we show this?
Complex Words in Turkish

Consider the following words from Turkish:

- [denizdzikde] ‘in a little ocean’
- [evdzikden] ‘from a little house’
- [eve] ‘to a house’
- [elim] ‘my hand’
- [difler] ‘teeth’

Observation:
Turkish can express in one word what English does in many words.

Reasonable Guess:
- Maybe some of these words contain a bunch of affixes?
- Maybe that’s how they get so long and get such ‘big’ meanings? (like ‘antidisestablishmentarianism’ in English)

Answer: We can’t (yet)
- We need more words of Turkish.
- With more words, we can start to look for systematic patterns of sound and meaning!
Complex Words in Turkish

So, consider now these words of Turkish:

[dəˈniz dʒiˈkde]  ‘in a little ocean’
[ɛv dʒiˈkde]  ‘from a little house’
[ev]  ‘to a house’
[əˈlim]  ‘my hand’
[ʃiˈfər]  ‘teeth’
[dəˈniz]  ‘an ocean’
[deˈniz]  ‘to an ocean’
[ev ˈdeŋ]  ‘from a house’
[ɛlde]  ‘in a hand’
[ɛv dʒiˈklaɾimizde]  ‘in our little houses’
Complex Words in Turkish

So, consider now these words of Turkish:

- [denizdzikde] ‘in a little ocean’
- [evdzikden] ‘from a little house’
- [eve] ‘to a house’
- [elim] ‘my hand’
- [diʃler] ‘teeth’
- [deniz] ‘an ocean’
- [denize] ‘to an ocean’
- [evden] ‘from a house’
- [elde] ‘in a hand’
- [evdziklerimizde] ‘in our little houses’

▶ Now we have enough words to start figuring out how ‘[denizdzikde]’ is broken down into morphemes.

▶ Here’s how we do this step-by-step...
Step 1: Identify the Meaning

For the word you are interested in, identify that part of the word’s meaning that you want to find the morpheme for.

[denizdzikde] ‘in a little ocean’
[evdzikden] ‘from a little house’
[evde] ‘to a house’
[elde] ‘my hand’
[dijler] ‘teeth’
[deniz] ‘an ocean’
[denize] ‘to an ocean’
[evden] ‘from a house’
[elde] ‘in a hand’
[evdziklerimizde] ‘in our little houses’
## Step 1: Identify the Meaning

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<tr>
<th>Word</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>[denizdzikde]</td>
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### Illustration:
- [denizdzikde] ‘in a little ocean’
Step 1: Identify the Meaning

For the word you are interested in, identify that part of the word’s meaning that you want to find the morpheme for.

Illustration: [denizdzikde] ‘in a little ocean’
Step 2: Find Words with that Meaning

- [denizdzikde]  ‘in a little ocean’
- [evdzikden]   ‘from a little house’
- [eve]         ‘to a house’
- [elim]        ‘my hand’
- [dişler]      ‘teeth’
- [deniz]       ‘an ocean’
- [denize]      ‘to an ocean’
- [evden]       ‘from a house’
- [elde]        ‘in a hand’
- [evdziklerimizde]  ‘in our little houses’

Step 2:
Gather up all the words that share that part of the meaning you’ve identified.

Illustration: [denizdzikde] ‘in a little ocean’
Step 2: Find Words with that Meaning

[denizdzikde]  ‘in a little ocean’
[evdzikden]  ‘from a little house’
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[evdziklerimizde]  ‘in our little houses’

Step 2:
Gather up all the words that share that part of the meaning you’ve identified.

Illustration:  [denizdzikde]  ‘in a little ocean’
  ▶  [denizdzikde]  ‘in a little ocean’
  ▶  [deniz]  ‘an ocean’
  ▶  [denize]  ‘to an ocean’
Step 3: Find the Common Sounds

- [denizdzikde] ‘in a little ocean’
- [evdzikden] ‘from a little house’
- [eve] ‘to a house’
- [elim] ‘my hand’
- [diʃler] ‘teeth’
- [deniz] ‘an ocean’
- [denize] ‘to an ocean’
- [evden] ‘from a house’
- [elde] ‘in a hand’
- [evdziklerimizde] ‘in our little houses’

Step 3:

- Out of those words, find the largest (continuous) sequence of phones they have in common
- That is (most likely) the morpheme that expresses that meaning.

Illustration: [denizdzikde] ‘in a little ocean’

- [denizdzikde] ‘in a little ocean’
- [deniz] ‘an ocean’
- [denize] ‘to an ocean’
- [denize] ‘to an ocean’
Step 3: Find the Common Sounds

- [denizdzikde] ‘in a little ocean’
- [evdzikden] ‘from a little house’
- [eve] ‘to a house’
- [elim] ‘my hand’
- [dijler] ‘teeth’
- [deniz] ‘an ocean’
- [denize] ‘to an ocean’
- [evden] ‘from a house’
- [elde] ‘in a hand’
- [evdziklerimizde] ‘in our little houses’

Step 3:
- Out of those words, find the largest (continuous) sequence of phones they have in common
- That is (most likely) the morpheme that expresses that meaning.

Illustration:  [denizdzikde] ‘in a little ocean’
- [denizdzikde] ‘in a little ocean’
- [deniz] ‘an ocean’
- [denize] ‘to an ocean’
Step 3: Find the Common Sounds

| [denizdzikde] | ‘in a little ocean’ |
| [evdzikden] | ‘from a little house’ |
| [eve] | ‘to a house’ |
| [elim] | ‘my hand’ |
| [dijler] | ‘teeth’ |
| [deniz] | ‘an ocean’ |
| [denize] | ‘to an ocean’ |
| [evden] | ‘from a house’ |
| [elde] | ‘in a hand’ |
| [evdziklerimizde] | ‘in our little houses’ |

Step 3:

- Out of those words, find the largest (continuous) sequence of phones they have in common
- That is (most likely) the morpheme that expresses that meaning.

Conclusion: [deniz] = ‘ocean’

- [denizdzikde] ‘in a little ocean’
- [deniz] ‘an ocean’
- [denize] ‘to an ocean’
Step 3: Find the Common Sounds

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Step 3:

▶ Out of those words, find the largest (continuous) sequence of phones they have in common
▶ That is (most likely) the morpheme that expresses that meaning.

Conclusion: \[\text{[deniz]} = \text{ocean}\]

Now let’s iterate this procedure, to figure out what the other morphemes in ‘[denizdzikde]’ are.
Step 1: Identify the Meaning

For the word you are interested in, identify that part of the word’s meaning that you want to find the morpheme for.

Illustration:  
[denizdzikde]  ‘in a little ocean’
Step 1: Identify the Meaning

For the word you are interested in, identify that part of the word’s meaning that you want to find the morpheme for.

Illustration: [denizdzikde] ‘in a little ocean’
Step 2: Find Words with that Meaning

[denizdzikde]  ‘in a little ocean’
[evdzikden]  ‘from a little house’
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[deniz]  ‘an ocean’
[denize]  ‘to an ocean’
[evden]  ‘from a house’
[elde]  ‘in a hand’
[evdziklerimizde]  ‘in our little houses’

Step 2:
Gather up all the words that share that part of the meaning you’ve identified.

Illustration:  [denizdzikde]  ‘in a little ocean’
Step 2: Find Words with that Meaning

[denizdzikde]  ‘in a little ocean’
[evdzikden]  ‘from a little house’
[eve]  ‘to a house’
[elim]  ‘my hand’
[dijler]  ‘teeth’
[deniz]  ‘an ocean’
[denize]  ‘to an ocean’
[evden]  ‘from a house’
[elde]  ‘in a hand’
[evdziklerimizde]  ‘in our little houses’

Step 2:
Gather up all the words that share that part of the meaning you’ve identified.

Illustration:  [denizdzikde]  ‘in a little ocean’
➤ [denizdzikde]  ‘in a little ocean’
➤ [evdzikden]  ‘from a little house’
➤ [evdziklerimizde]  ‘in our little houses’
Step 3: Find the Common Sounds

[denizdzikde]  ‘in a little ocean’
[evdzikden]  ‘from a little house’
[eve]  ‘to a house’
[elim]  ‘my hand’
[dijler]  ‘teeth’
[deniz]  ‘an ocean’
[denize]  ‘to an ocean’
[evden]  ‘from a house’
[elde]  ‘in a hand’
[evdziklerimizde]  ‘in our little houses’

Step 3:

▶ Out of those words, find the largest (continuous) sequence of phones they have in common
▶ That is (most likely) the morpheme that expresses that meaning.

Illustration:  [denizdzikde]  ‘in a little ocean’
▶ [denizdzikde]  ‘in a little ocean’
▶ [evdzikden]  ‘from a little house’
▶ [evdziklerimizde]  ‘in our little houses’
### Step 3: Find the Common Sounds

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**Step 3:**

- Out of those words, find the largest (continuous) sequence of phones they have in common.
- That is (most likely) the morpheme that expresses that meaning.

**Illustration:**

- [denizdzikde] ‘in a little ocean’
- [denizdzikde] ‘in a little ocean’
- [evdzikden] ‘from a little house’
- [evdziklerimizde] ‘in our little houses’
### Step 3: Find the Common Sounds

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**Step 3:**

- Out of those words, find the largest (continuous) sequence of phones they have in common.
- That is (most likely) the morpheme that expresses that meaning.

**Conclusion:** 

[dzik] = ‘little’

- [denizdzikde]   ‘in a little ocean’
- [evdzikden]     ‘from a little house’
- [evdziklerimizde] ‘in our little houses’
Step 3: Find the Common Sounds

[denizdzikde] → ‘in a little ocean’
[evdzikden] → ‘from a little house’
[eve] → ‘to a house’
[elim] → ‘my hand’
[dije] → ‘teeth’
[deniz] → ‘an ocean’
[denize] → ‘to an ocean’
[evden] → ‘from a house’
[elde] → ‘in a hand’
[evdziklerimizde] → ‘in our little houses’

Step 3:

- Out of those words, find the largest (continuous) sequence of phones they have in common
- That is (most likely) the morpheme that expresses that meaning.

Conclusion: [dzik] = ‘little’

Let’s do this one more time, to figure out the third and final morpheme in ‘[denizdzikde]’.
Step 1: Identify the Meaning

For the word you are interested in, identify that part of the word’s meaning that you want to find the morpheme for.

**Illustration:**  
[denizdzikde]  ‘in a little ocean’

[evdzikden]  ‘from a little house’

[eve]  ‘to a house’

[elim]  ‘my hand’

[dijler]  ‘teeth’

[deniz]  ‘an ocean’

[denize]  ‘to an ocean’

[evden]  ‘from a house’

[elde]  ‘in a hand’

[evdziklerimizde]  ‘in our little houses’
Step 1: Identify the Meaning

For the word you are interested in, identify that part of the word’s meaning that you want to find the morpheme for.

Illustration: [denizdzikde] ‘in a little ocean’
Step 2: Find Words with that Meaning

[denizdzikde] ‘in a little ocean’
[evdzikden] ‘from a little house’
[eve] ‘to a house’
[elim] ‘my hand’
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[deniz] ‘an ocean’
[denize] ‘to an ocean’
[evden] ‘from a house’
[elde] ‘in a hand’
[evdziklerimizde] ‘in our little houses’

Step 2:
Gather up all the words that share that part of the meaning you’ve identified.

Illustration: [denizdzikde] ‘in a little ocean’
Step 2: Find Words with that Meaning

[denizdzikde]  ‘in a little ocean’
[evdzikden]  ‘from a little house’
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[deniz]  ‘an ocean’
[denize]  ‘to an ocean’
[evden]  ‘from a house’
[elde]  ‘in a hand’
[evdziklerimizde]  ‘in our little houses’

Step 2:
Gather up all the words that share that part of the meaning you’ve identified.

Illustration:  [denizdzikde]  ‘in a little ocean’
▶  [denizdzikde]  ‘in a little ocean’
▶  [elde]  ‘in a hand’
▶  [evdziklerimizde]  ‘in our little houses’
Step 3: Find the Common Sounds

[denizdzikde] ‘in a little ocean’
[evdzikden] ‘from a little house’
[eve] ‘to a house’
[elim] ‘my hand’
[dijler] ‘teeth’
[deniz] ‘an ocean’
[denize] ‘to an ocean’
[evden] ‘from a house’
[elde] ‘in a hand’
[evdziklerimizde] ‘in our little houses’

Step 3:
- Out of those words, find the largest (continuous) sequence of phones they have in common
- That is (most likely) the morpheme that expresses that meaning.

Illustration: [denizdzikde] ‘in a little ocean’
- [denizdzikde] ‘in a little ocean’
- [elde] ‘in a hand’
- [evdziklerimizde] ‘in our little houses’
Step 3: Find the Common Sounds

[denizdzikde] ‘in a little ocean’
[evdzikden] ‘from a little house’
[eve] ‘to a house’
[elim] ‘my hand’
[dijler] ‘teeth’
[deniz] ‘an ocean’
[denize] ‘to an ocean’
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[elde] ‘in a hand’
[evdziklerimizde] ‘in our little houses’

Step 3:
▶ Out of those words, find the largest (continuous) sequence of phones they have in common
▶ That is (most likely) the morpheme that expresses that meaning.

Illustration: [denizdzikde] ‘in a little ocean’
▶ [denizdzikde] ‘in a little ocean’
▶ [elde] ‘in a hand’
▶ [evdziklerimizde] ‘in our little houses’
### Step 3: Find the Common Sounds

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#### Step 3:
- Out of those words, find the largest (continuous) sequence of phones they have in common.
- That is (most likely) the morpheme that expresses that meaning.

#### Conclusion: 
- [de] = ‘in’
- [denizdzikde] ‘in a little ocean’
- [elde] ‘in a hand’
- [evdziklerimizde] ‘in our little houses’
Step 3: Find the Common Sounds

[denizdzikde] ‘in a little ocean’
[evdzikden] ‘from a little house’
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[deniz] ‘an ocean’
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[elde] ‘in a hand’
[evdziklerimizde] ‘in our little houses’

Summary:
We’ve figured out all the morphemes in [denizdzikde]’

- [deniz] = ‘ocean’
- [dzik] = ‘little’
- [de] = ‘in’

Try at home to use this procedure to find all the other morphemes in all the other words listed above!