Morphophonemics

As noted in the text, a word's pronunciation can be sensitive to morphological factors. Morphophonemic variation is characterized by two signposts—it tends to occur at morpheme boundaries and it involves sounds that are associated with separate phonemes. The study of these phenomena is known as **morphophonemics.** We will consider two morphophonemic phenomena here, one involving the selection of the correct form of the English plural suffix (briefly mentioned in the textbook) and the other involving plurals in which the final consonant of the root changes (as in *thief–thieves*).

Deriving allomorphs

When linguists find that the same morpheme has more than one form (or allomorph), they often seek to set up a single underlying representation for the morpheme and to formulate rules that will derive the appropriate pronunciation for any particular context. To see how this works, let us consider in more detail the precise environments in which the different allomorphs of the English plural morpheme occur (see Table 1, which follows). To keep matters as simple as possible, we will use phonemic transcription here rather than phonetic transcription. (Recall that the alternation in question involves sounds that belong to separate phonemes.)

Table 1	English plural allomorphs	
/-s/		
tops	/taps/	**Environment**
mitts	/mɪts/	• base ends in a voiceless consonant that is
backs	/bæks/	not strident
puffs	/pʌfs/	
baths	/bæθs/	
/-z/		
cobs	/kabz/	
lids	/lɪdz/	
bugs	/bʌgz	
doves	/dʌvz/	**Environment**
lathes	/leđz/	• base ends in a vowel or a voiced consonant
pins	/pɪnz/	that is not strident
bums	/bʌmz/	
wings	/wɪŋz/	
teas	/tiz/	
days	/dez/	
/-əz/		
hisses	/hɪsəz/	**Environment**
buzzes	/bʌzəz/	• base ends in a consonant that is strident
crutches	/krʌtʃəz/	(s, z, ʃ, ʒ, tʃ, dʒ)
luges	/luʒəz/	
judges	/dʒʌdʒəz/	
wishes	/wɪʃəz/	

As you can see, the choice of plural allomorph is determined by the final segment of the base. Bases that end in a nonstrident voiceless consonant take the voiceless /-s/ allomorph. Bases that end in a vowel or a nonstrident voiced consonant take the voiced /-z/ allomorph. And bases that end in a strident (sibilant) consonant occur with the /-əz/ allomorph, to avoid having an illegal consonant cluster, as we will see.

In selecting the underlying representation of a morpheme, it is common to choose the allomorph with the widest distribution. This happens to be /-z/ in the case of the English plural morpheme because it occurs after most voiced consonants and after all vowels (which are also voiced). This is no accident, of course, since /-z/ too is voiced.

The words *lips*, *pills*, and *glasses* therefore have the underlying representations depicted in *1)*.

1)

lɪp-z 'lips'   pɪl-z 'pills'   glæs-z 'glasses'

Two rules are now required to derive the correct final form of these words. The first rule, which we will call Coda Epenthesis, inserts a schwa whenever the /-z/ appears after a base that ends in a strident consonant, thereby breaking up the otherwise illegal consonant cluster.

2)

Coda Epenthesis

Ø → ə   /[+strident] _____ -z

The second rule needed to ensure that the plural morpheme has the right form devoices /-z/ when it occurs after a voiceless consonant in the same coda.

3)

Devoicing

-z   →   [-voice] / [-voice] _____]$_\sigma$

Like Coda Epenthesis, Devoicing helps ensure that English plurals comply with the usual phonotactic constraints of the language: no English words contain a coda in which a voiceless consonant is followed by a voiced one.

Figure 1 illustrates the derivations of all three plural allomorphs.

	lips	*pills*	*glasses*
Underlying representation:	lɪp-z	pɪl-z	glæs-z
Coda Epenthesis:	—	—	glæs-əz
Devoicing:	lɪp-s	—	—

Figure 1 Underlying representations and derivations for the three plural allomorphs in English

Notice that the ordering of the rules is crucial here. If Devoicing applied first, as shown in Figure 2, the plural ending of forms such as *glasses* would incorrectly end up as */glæs-s/, since Coda Epenthesis would not apply.

Underlying representation:	glæs-z
Devoicing:	glæs-s
Coda Epenthesis:	—

Figure 2 Derivation for *glasses* in which Devoicing incorrectly applies before Coda Epenthesis

Conditioning by morphological class

A second type of morphophonemic phenomenon is manifested in just a subclass of morphemes. This too can be illustrated with the help of English plurals.

As the examples in Table 2 show, English includes a limited class of words in which an /f/ at the end of the base alternates with /v/ when there is a plural suffix.

Table 2 Alternating base-final /f/ and /v/ in English			
The f~v alternation (irregular forms)		No alternation (regular forms)	
wife	wives	whiff	whiffs
thief	Thieves	chief	chiefs
leaf	leaves	fife	fifes
knife	knives	laugh	laughs

The alternating class is unproductive, and new words with final /f/ entering English do not exhibit the *f–v* alternation. That is why a hypothetical new word such as *nif* would have /nɪfs/ rather than */nɪvz/ as its plural form.

We can formulate the process that is responsible for the *f–v* alternation as follows.

4)

/f/ Voicing

f → v / ___]–Plural

Notice the usual hallmarks of a morphophonemic phenomenon. The alternation takes place at a morpheme boundary, and it involves sounds that belong to separate phonemes (/f/ and /v/). Moreover, the phenomenon affects only certain root morphemes (e.g. *thief*, but not *chief*) and only the plural suffix (there is no *f–v* alternation with the possessive morpheme –*'s*, which is why we say *his wife'*/s/ *car*, not **his wive-'*/z/ *car*). Morphophonemic rules are thus very different from allophonic rules, which apply very generally—all vowels occurring before a nasal in the same syllable are nasalized; all vowels occurring before a voiced consonant in the same syllable are lengthened; and so on. But only some base–final /f/s are converted to /v/ in the plural.

Figure 3 illustrates how the plural forms of *thief* and *chief* are derived from the appropriate underlying representations.

	thieves	*chiefs*
Underlying representation:	θif-z	tʃif-z
The /f/-to-/v/ rule:	θiv-z	—
Devoicing:	—	tʃif-s

Figure 3 Underlying representations and derivations for *thieves* and *chiefs*

Once again, rule ordering is important here. Unless the /f/ Voicing rule applies before Devoicing, the final form of *thieves* will be */θiv-s/, with the /-s/ allomorph of the plural, as shown in Figure 4.

Underlying representation:	θif-z
Devoicing:	θif-s
/f/ Voicing	*θiv-s

Figure 4 Derivation for *thieves* in which Devoicing incorrectly applies before the /f/-to-/v/ rule

Other examples of underlying representations

As the preceding examples help show, the underlying representations needed to account for morphophonemic phenomena may be quite unlike a word's phonetic form. Another example of this involves the morpheme *electric* in words like *electrical* and *electricity*, for which linguists often posit the underlying representations in *5)*.

5)

/ilɛktrɪk-l̩/ /ilɛktrɪk-ɪti/

A morphophonemic rule then converts the /k/ of the base to /s/ in front of the affix *–ity*. Notice once again that the rule involves sounds that belong to separate phonemes (/k/ and /s/) and that it applies only at a morpheme boundary, which is why we don't pronounce *kill* as *sill!*

The variant of the base that ends in *k* is chosen as underlying for two reasons. First, the base *electri*/k/ has a wider distribution than the allomorph *electri*/s/, since it occurs in words such as *electrical* as well as in the unsuffixed form *electric*. Second, a rule that fronts a /k/ to /s/ before the high front vowel of the suffix is phonetically more natural than a rule that changes an /s/ to /k/ in final position or before the suffix *–al*. (Recall that /s/ is produced in the front portion of the mouth with the tongue tip raised.)

A more complicated example, shown in Figure 5, involves the three-way alternation involving *submit*, *submissive*, and *submission*. The underlying representation for the root morpheme is /sʌbmɪt/, with a /t/-to-/s/ rule

accounting for the /s/ before the suffix *–ive* in the second form and a /t/ –to –/ʃ/ rule giving the /ʃ/ before the suffix *–ion* in the third word.

	submit	submissive	submission
UR	sʌbmɪt	sʌbmɪt - ɪv	sʌbmɪt - n̩
t-to-s	—	sʌbmɪsɪv	
t-to-ʃ	—	—	sʌbmɪʃn̩

Figure 5 Derivations for submit, submissive, and submission

This sort of analysis has proven to be very popular over the years, primarily because it allows linguists to posit a single underlying representation for each morpheme and to find general rules that predict its actual pronunciation in particular contexts.