

sounds are called **sibilant** consonants. The English sibilants are [tʃ, ʃ, s, dʒ, ʒ, z]. Notice that the plural marker is also a sibilant. Because of the high-pitched hissing sound, it is very difficult to hear two sibilants that are next to each other. Try saying [faksz], [drtʃs], [brɪdʒz], etc., and you will get the idea. This is remedied by inserting a schwa between two sibilants.

**Schwa insertion** (English): Insert [ə] between two sibilants.

With these two rules, we can derive the plural for any English noun (except, of course, for special plurals like *oxen*, *octopi*, and *cherubim*).

<b>phonemic form:</b>	/kæt+z/	/dag+z/	/faks+z/	/brɪdʒ+z/
<b>schwa insertion:</b>	—	—	faksəz	brɪdʒəz
<b>voicing assimilation:</b>	kæts	—	—	—
<b>phonetic form:</b>	[kæts]	[dagz]	[faksəz]	[brɪdʒəz]

### 4.3.5 Obligatory and Optional Rules

Notice that phonological rules may be **obligatory** or **optional**. Obligatory English rules include aspiration, vowel nasalization, vowel lengthening, and liquid and glide devoicing. Such a rule always applies in the speech of all speakers of a language or dialect having the rule, regardless of style or rate of speaking. The effects of obligatory rules are often very subtle and difficult to notice, but they are an important part of a native accent. For instance, it may be difficult to tell that a vowel is nasalized in English, but the application of vowel nasalization makes us sound like native speakers of English.

The existence of obligatory rules is what causes people to have foreign accents. It is easier to learn the rules of a new language than to “turn off” the obligatory rules of your native language. The very fact that we are often unaware of these rules causes us to apply them when they are not appropriate. When speakers of American English learn other languages, they often apply rules such as flapping and vowel reduction, even though the other language may not have these rules.

Optional phonological rules, on the other hand, may or may not apply in an individual's speech. Optional rules are responsible for variation in speech; for example, we can pronounce /kæn bi/ *can be* as either [kæm bi] or [kæn bi], depending on whether Alveolar Stop Assimilation is applied or not. The use of optional rules depends in part on rate and style of speech.

### 4.3.6 Conclusion

In this file we have covered seven types of phonological rules: assimilation, dissimilation, insertion, deletion, metathesis, strengthening, and weakening. These phonological rules operate on natural classes of sounds. We have also shown that a natural class is a group of all the sounds in a language that share some articulatory or auditory property(s) to the exclusion of all other sounds in that language. To describe natural classes we have used the properties *consonant*, *vowel*, *labial*, *sibilant*, *obstruent*, and *sonorant*, as well as properties used to describe individual consonants and vowels.

### Exercises

1. List the members of the following natural classes of English sounds.

- a. alveolar obstruents
- b. voiced labial consonants

- c. velar oral stops
  - d. interdental fricatives
  - e. high tense vowels
  - f. low vowels
  - g. palatal sonorants
  - h. voiced sibilants
2. Describe the following natural classes of English sounds.
- a. [r, l]
  - b. [f, θ, s, ʃ, h]
  - c. [w, j, ɹ]
  - d. [i, u]
  - e. [p, b]
  - f. [n, r, l]
3. Consider the following paragraphs and answer the questions about natural classes.
- a. The English indefinite article is *a* [ʌ] before most words: *a car*, *a peanut*, *a tennis ball*, etc., but it is *an* [æn] before words like *apple*, *onion*, *icicle*, *evening*, *eagle*, and *honor*. To what natural class do the sounds at the beginning of these words belong?
  - b. Some American English speakers (largely in the Midwest and South) pronounce [ɪ] in words like *then*, *Kenny*, *pen*, *Bengals*, *gem*, *lengthen*, *Remington*, and *temperature* (where other speakers have [ɛ]). What natural class of sounds follows these vowels?
  - c. Some midwestern American speakers in casual speech drop the unstressed vowel in the first syllable of words like *police*, *believe*, *parade*, *Columbus*, *pollution*, *terrific*, and *collision*, but do not drop it in words like *detective*, *dependent*, *majestic*, or *pedantic*. What natural class of sounds follows the unstressed vowel in the first syllable in this first group of words?
  - d. At some time during a child's language development, he or she might pronounce certain words as follows: *that* [dæt], *these* [diz], *this* [dɪs], and *three* [fri], *think* [fɪŋk], *bath* [bæf]. What natural class of sounds is being affected? Do the sounds used as replacements form a natural class?
4. Identify the phonological rule or rules from this file operating in each of the following derivations.
- |                 |               |   |                                       |
|-----------------|---------------|---|---------------------------------------|
| a. little       | /lɪtəl/       | → | [lɪɾ]                                 |
| b. late bell    | /leɪt bəl/    | → | [leɪp bəl]                            |
| c. park         | /pɑrk/        | → | [p <sup>h</sup> ɑrk]                  |
| d. lance        | /læns/        | → | [lænts]                               |
| e. It's her car | /ɪts hɜr kɑr/ | → | [ɪts ɾ k <sup>h</sup> ɑr]             |
| f. ten pages    | /ten peɪdʒz/  | → | [tɛm p <sup>h</sup> eɪdʒəz]           |
| g. two cups     | /tu kʌpz/     | → | [t <sup>h</sup> u k <sup>h</sup> ʌps] |
5. Examine the following sets of data, and for each set write a rule to describe the derivation of the phonetic forms from the phonemic ones. (To do so, determine what sound or natural class of sounds is being altered, what the environment is, and what is changing.)

## 1.6 Korean

In the following Korean words, you will find the sounds [s] and [ʃ]. Determine whether the sounds [s] and [ʃ] are allophones of the same phoneme or separate phonemes. If the sounds are allophones of the same phoneme, give the basic and derived allophones and the environment in which the derived allophone occurs.

- |                  |                |                  |               |
|------------------|----------------|------------------|---------------|
| 1. [ʃi]          | 'poem'         | 11. [sal]        | 'flesh'       |
| 2. [miʃin]       | 'superstition' | 12. [tʃasal]     | 'suicide'     |
| 3. [ʃinmun]      | 'newspaper'    | 13. [kasu]       | 'singer'      |
| 4. [tʰaksanʃige] | 'table clock'  | 14. [sanmun]     | 'prose'       |
| 5. [ʃilsu]       | 'mistake'      | 15. [kasəl]      | 'hypothesis'  |
| 6. [oʃip]        | 'fifty'        | 16. [tʃəŋsonjəŋ] | 'adolescents' |
| 7. [tʃaʃin]      | 'self'         | 17. [miso]       | 'smile'       |
| 8. [paŋʃik]      | 'method'       | 18. [susek]      | 'search'      |
| 9. [kanʃik]      | 'snack'        | 19. [tapsa]      | 'exploration' |
| 10. [kaʃi]       | 'thorn'        | 20. [so]         | 'cow'         |

## 1.7 Same

Examine the data from Same (Lappish) below. First consider [tʰ] and [kʰ] ([ʰ] indicates that the sounds are palatalized). Are they allophones of the same phoneme or do they belong to separate phonemes? Identify the type of distribution. Give evidence for your claim. Second, consider the sonorants. Are the voiced and voiceless sonorants in contrastive or complementary distribution? Give evidence for your claim. Finally, consider the phone [ʔ]. Is it an allophone of /t/ or an allophone of a separate phoneme? Give evidence for your claim.

- |               |              |                |                |
|---------------|--------------|----------------|----------------|
| 1. [pa:tʰtʰi] | 'smithy'     | 8. [fana:s]    | 'boat'         |
| 2. [la:kʰkʰu] | 'meadow'     | 9. [vahŋemaht] | 'parents'      |
| 3. [pa:tni]   | 'tooth'      | 10. [tsabma]   | 'she/he whips' |
| 4. [kihʰi:ht] | 'engagement' | 11. [la:ritas] | 'unpleasant'   |
| 5. [liehmu]   | 'mild'       | 12. [la:tʰtʰu] | 'meadow'       |
| 6. [pa:kʰkʰi] | 'smithy'     | 13. [nama:ht]  | 'names'        |
| 7. [miha:ʔ]   | 'a lot'      | 14. [pa:ʔni]   | 'tooth'        |

## 1.8 English

In the following dialect of English there is a predictable variant [əɪ] of the diphthong [aɪ]. What phonetic segments condition this change? What feature(s) characterize the class of conditioning segments?

- |           |              |            |              |             |              |
|-----------|--------------|------------|--------------|-------------|--------------|
| 1. [bəɪt] | <i>bite</i>  | 6. [fəɪt]  | <i>fight</i> | 11. [təɪm]  | <i>time</i>  |
| 2. [taɪ]  | <i>tie</i>   | 7. [baɪ]   | <i>buy</i>   | 12. [təɪp]  | <i>type</i>  |
| 3. [raɪd] | <i>ride</i>  | 8. [raɪs]  | <i>rice</i>  | 13. [naɪmθ] | <i>ninth</i> |
| 4. [raɪz] | <i>rise</i>  | 9. [faɪl]  | <i>file</i>  | 14. [faɪr]  | <i>fire</i>  |
| 5. [rəɪt] | <i>write</i> | 10. [ləɪf] | <i>life</i>  | 15. [bəɪk]  | <i>bike</i>  |