



2

Morphology: The Words of Language

By words the mind is winged.

ARISTOPHANES (450 BCE–388 BCE)

A powerful agent is the right word. Whenever we come upon one of those intensely right words . . . the resulting effect is physical as well as spiritual, and electrically prompt.

MARK TWAIN

Every speaker of every language knows tens of thousands of words. Unabridged dictionaries of English contain nearly 500,000 entries, but most speakers don't know all of these words. It has been estimated that a child of six knows as many as 13,000 words and the average high school graduate about 60,000. A college graduate presumably knows many more than that, but whatever our level of education, we learn new words throughout our lives, such as the many words in this book that you will learn for the first time.

Words are an important part of linguistic knowledge and constitute a component of our mental grammars, but one can learn thousands of words in a language and still not know the language. Anyone who has tried to communicate in a foreign country by merely using a dictionary knows this is true. On the other hand, without words we would be unable to convey our thoughts through language or understand the thoughts of others.

Someone who doesn't know English would not know where one word begins or ends in an utterance like *Thecatsatonthemat*. We separate written words by spaces, but in the spoken language there are no pauses between most words. Without knowledge of the language, one can't tell how many words are in an utterance. Knowing a word means knowing that a particular sequence of sounds is associated with a particular meaning. A speaker of English has no difficulty in segmenting the stream of sounds into six individual words—*the*, *cat*, *sat*, *on*, *the*, and *mat*—because each of these words is listed in his or her mental dictionary, or lexicon (the Greek word for *dictionary*), that is part of a speaker's linguistic knowledge. Similarly, a speaker knows that *uncharacteristically*, which has more letters than *Thecatsatonthemat*, is nevertheless a single word.

The lack of pauses between words in speech has provided humorists with much material. The comical hosts of the show *Car Talk*, aired on National Public Radio (as reruns nowadays), close the show by reading a list of credits that includes the following cast of characters:

| | |
|--------------------|---|
| Copyeditor: | Adeline Moore (add a line more) |
| Accounts payable: | Ineeda Czech (I need a check) |
| Pollution control: | Maury Missions (more emissions) |
| Purchasing: | Lois Bidder (lowest bidder) |
| Statistician: | Marge Innovera (margin of error) |
| Russian chauffeur: | Picov Andropov (pick up and drop off) |
| Legal firm: | Dewey, Cheetham, and Howe (Do we cheat 'em? And how!) ¹ |

In all these instances, you would have to have knowledge of English words to make sense of and find humor in such plays on words.

The fact that the same sound sequences (Lois Bidder—lowest bidder) can be interpreted differently shows that the relation between sound and meaning is an arbitrary pairing, as discussed in chapter 1. For example, *Un petit d'un petit* in French means 'a little one of a little one,' but to an English speaker the sounds resemble the name *Humpty Dumpty*.

When you know a word, you know its sound (pronunciation) and its meaning. Because the sound-meaning relation is arbitrary, it is possible to have words with the same sound and different meanings (*bear* and *bare*) and words with the same meaning and different sounds (*sofa* and *couch*).

Because each word is a sound-meaning unit, each word stored in our mental lexicon must be listed with its unique phonological representation, which determines its pronunciation, and with a meaning. For literate speakers, the spelling, or **orthography**, of most of the words we know is included.

Each word in your mental lexicon includes other information as well, such as whether it is a noun, a pronoun, a verb, an adjective, an adverb, a preposition, or a conjunction. That is, the mental lexicon also specifies the **grammatical category** or **syntactic class** of the word. You may not consciously

¹"Car Talk" credits from National Public Radio.™ Dewey, Cheetham & Howe, 2006, all rights reserved.

know that a form like *love* is listed as both a verb and a noun, but as a speaker you have such knowledge, as shown by the phrases *I love you* and *You are the love of my life*. If such information were not in the mental lexicon, we would not know how to form grammatical sentences, nor would we be able to distinguish grammatical from ungrammatical sentences.

Content Words and Function Words

“. . . and even . . . the patriotic archbishop of Canterbury found it advisable—”

“Found what?” said the Duck.

“Found it,” the Mouse replied rather crossly; “of course you know what ‘it’ means.”

“I know what ‘it’ means well enough, when I find a thing,” said the Duck; “it’s generally a frog or a worm. The question is, what did the archbishop find?”

LEWIS CARROLL, *Alice’s Adventures in Wonderland*, 1865

Languages make an important distinction between two kinds of words—content words and function words. Nouns, verbs, adjectives, and adverbs are the **content words**. These words denote concepts such as objects, actions, attributes, and ideas that we can think about like *children*, *build*, *beautiful*, and *seldom*. Content words are sometimes called the **open class** words because we can and regularly do add new words to these classes, such as *Facebook* (noun), *blog* (noun, verb), *frack* (verb), *online* (adjective, adverb), and *blingy* (adjective).

Other classes of words do not have clear lexical meanings or obvious concepts associated with them, including conjunctions such as *and*, *or*, and *but*; prepositions such as *in* and *of*; the articles *the* and *a/an*, and pronouns such as *it*. These kinds of words are called **function words** because they specify grammatical relations and have little or no semantic content. For example, the articles indicate whether a noun is definite or indefinite—*the* boy or *a* boy. The preposition *of* indicates possession, as in “the book of yours,” but this word indicates many other kinds of relations too. The *it* in *it’s raining* and *the archbishop found it advisable* are further examples of words whose function is purely grammatical—they are required by the rules of syntax and we can hardly do without them.

Function words are sometimes called **closed class** words. This is because it is difficult to think of any conjunctions, prepositions, or pronouns that have recently entered the language. The small set of personal pronouns such as *I*, *me*, *mine*, *he*, *she*, and so on are part of this class. With the growth of the feminist movement, some proposals have been made for adding a genderless singular pronoun. If such a pronoun existed, it might have prevented the department head in a large university from making the incongruous statement: “We will hire the best person for the job regardless of his sex.” Various proposals such as “e” have been put forward, but none are likely to gain traction because the closed classes are unreceptive to new membership. Rather, speakers prefer to recruit existing pronouns such as *they* and *their* for this job, as in “We will hire the best person for the job regardless of **their** sex.” A convenient play used by

writers is *s/he* or *she/he* pronounced “shee-hee” when read aloud, as in *If any student wishes to leave early, s/he must obtain special permission.*

The difference between content and function words is illustrated by the following test that has circulated over the Internet:

Count the number of F’s in the following text without reading further, then check the footnote:²

FINISHED FILES ARE THE
RESULT OF YEARS OF SCIENTIFIC
STUDY COMBINED WITH THE
EXPERIENCE OF YEARS.

This little test illustrates that the brain treats content and function words (like *of*) differently. A great deal of psychological and neurological evidence supports this claim. As discussed in chapter 10, some brain-damaged patients and people with specific language impairments have greater difficulty in using, understanding, or reading function words than they do with content words. Some aphasics are unable to read function words like *in* or *which*, but can read the lexical content words *inn* and *witch*.

The two classes of words also seem to function differently in **slips of the tongue** produced by normal individuals. For example, a speaker may inadvertently switch words producing “the journal of the editor” instead of “the editor of the journal,” but the switching or exchanging of function words has not been observed. There is also evidence for this distinction from language acquisition (discussed in chapter 9). In the early stages of development, children often omit function words from their speech, as in, for example, “doggie barking.”

The linguistic evidence suggests that content words and function words play different roles in language. Content words bear the brunt of the meaning, whereas function words connect the content words to the larger grammatical context.

Morphemes: The Minimal Units of Meaning

“They gave it me,” Humpty Dumpty continued, “for an un-birthday present.”

“I beg your pardon?” Alice said with a puzzled air.

“I’m not offended,” said Humpty Dumpty.

“I mean, what is an un-birthday present?”

“A present given when it isn’t your birthday, of course.”

LEWIS CARROLL, *Through the Looking-Glass*, 1871

²Most people come up with three, which is wrong. If you came up with fewer than six, count again, and this time, pay attention to the function word *of*.

Humpty Dumpty is well aware that the prefix *un-* means ‘not,’ as further shown in the following pairs of words:

| A | B |
|---------------|-----------------|
| desirable | undesirable |
| likely | unlikely |
| inspired | uninspired |
| happy | unhappy |
| developed | undeveloped |
| sophisticated | unsophisticated |

Thousands of English adjectives begin with *un-*. If we assume that the most basic unit of meaning is the word, what do we say about parts of words, like *un-*, which has a fixed meaning? In all the words in the B column, *un-* means the same thing—‘not.’ *Undesirable* means ‘not desirable,’ *unlikely* means ‘not likely,’ and so on. All the words in column B consist of at least two meaningful units: *un* + *desirable*, *un* + *likely*, *un* + *inspired*, and so on.

Just as *un-* occurs with the same meaning in the previous list of words, so does *phon-* in the following words. (You may not know the meaning of some of them, but you will when you finish this book.)

| | | |
|-------------|--------------|------------|
| phone | phonology | phoneme |
| phonetic | phonologist | phonemic |
| phonetics | phonological | allophone |
| phonetician | telephone | euphonious |
| phonic | telephonic | symphony |

Phon- is a minimal form in that it can’t be decomposed. *Ph* doesn’t mean anything; *pho*, though it may be pronounced like *foe*, has no relation in meaning to it; and *on* is not the preposition spelled *o-n*. In all the words on the list, *phon* has the identical meaning ‘pertaining to sound.’

Words have internal structure that is rule-governed. *Uneaten*, *undisputed*, and *ungrammatical* are words in English, but **eatenun*, **disputedun*, and **grammaticalun* (to mean ‘not eaten,’ ‘not disputed,’ ‘not grammatical’) are not words because we form a negative meaning of a word by prefixing *un-*, not by suffixing it.

When Samuel Goldwyn, the pioneer moviemaker, announced, “In two words: im-possible,” he was reflecting the common view that words are the basic meaningful elements of a language. We have seen that this cannot be so, because some words contain several distinct units of meaning. The linguistic term for the most elemental unit of grammatical form is **morpheme**. The word is derived from the Greek word *morphe*, meaning ‘form.’ If Goldwyn had taken a linguistics course, he would have said, more correctly, “In two morphemes: im-possible.”

The study of the internal structure of words, and of the rules by which words are formed, is **morphology**. This word itself consists of two morphemes, *morph* + *ology*. The suffix *-ology* means ‘branch of knowledge,’ so the meaning of *morphology* is ‘the branch of knowledge concerning (word) forms.’ Morphology also refers to our internal grammatical knowledge concerning the words of our language, and like most linguistic knowledge we are not consciously aware of it.

A single word may be composed of one or more morphemes:

| | |
|-----------------|---|
| One morpheme | boy desire meditate |
| two morphemes | boy + ish desire + able meditate + tion |
| three morphemes | boy + ish + ness desire + able + ity |
| four morphemes | gentle + man + li + ness un + desire + able + ity |
| more than four | un + gentle + man + li + ness anti + dis + establish + ment + ari + an + ism |

A morpheme may be represented by a single sound, such as the morpheme *a-* meaning ‘without’ as in *amoral* and *asexual*, or by a single syllable, such as *child* and *ish* in *child + ish*. A morpheme may also consist of more than one syllable: by two syllables, as in *camel*, *lady*, and *water*; by three syllables, as in *Hackensack* and *crocodile*; or by four or more syllables, as in *hallucinate*, *apothecary*, *helicopter*, and *accelerate*.

A morpheme—the minimal linguistic unit—is thus an arbitrary union of a sound and a meaning (or grammatical function) that cannot be further analyzed. So solidly welded is this union in the mind that it is impossible for you to hear or read a word you know and not be aware of its meaning, even if you try! These two sides of the same coin are often called a **linguistic sign**, not to be confused with the *sign* of sign languages. Every word in every language is composed of one or more morphemes.

The Discreteness of Morphemes



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Internet bloggers love to point out “inconsistencies” in the English language. They observe that while singers sing and flingers fling, it is not the case that fingers “fing.” However, English speakers know that *finger* is a single morpheme, or a **monomorphemic word**. The final *-er* syllable in *finger* is not a

separate morpheme because a finger is not “something that fings.” Similarly *butter* when not referring to goat-like behavior is monomorphemic food stuff, and *buttriss*, to be sure, is neither a feminine form of *butt* nor has anything to do with locks of hair.

The meaning of a morpheme must be constant. The agentive morpheme *-er* means ‘one who does’ in words like *singer*, *painter*, *lover*, and *worker*, but the same sounds represent the comparative morpheme, meaning ‘more,’ in *nicer*, *prettier*, and *taller*. Thus, two different morphemes may be pronounced identically. The identical form represents two morphemes because of the different meanings. The same sounds may occur in another word and not represent a separate morpheme at all, as in *finger*.

Conversely, the two morphemes *-er* and *-ster* have the same meaning, but different forms. Both *singer* and *songster* mean ‘one who sings.’ And like *-er*, *-ster* is not a morpheme in *monster* because a monster is not something that “mons” or someone that “is mon” the way *youngster* is someone who is young. All of this follows from the concept of the morpheme as a *sound* plus a *meaning* unit.

The decomposition of words into morphemes illustrates one of the fundamental properties of human language—discreteness—a property that sets it apart from the animal communication systems discussed in chapter 1. In all languages, sound units combine to form morphemes, morphemes combine to form words, and words combine to form larger units—phrases and sentences.

Discreteness is an important part of linguistic creativity. We can combine morphemes in novel ways to create new words whose meaning will be apparent to other speakers of the language. If you know that “to write” to a DVD means to put information on it, you automatically understand that a *writable* DVD is one that can take information; a *rewritable* DVD is one where the original information can be written over; and an *unrewritable* DVD is one that does not allow the user to write over the original information. You know the meanings of all these words by virtue of your knowledge of the discrete morphemes *write*, *re-*, *-able*, and *un-*, and the rules for their combination.

Bound and Free Morphemes



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Our morphological knowledge has two components: knowledge of the individual morphemes and knowledge of the rules that combine them. One of the things we know about particular morphemes is whether they can stand alone or whether they must be attached to a base morpheme. Some morphemes like *boy*, *desire*, *gentle*, and *man* may constitute words by themselves. These are **free morphemes**. Other morphemes like *-ish*, *-ness*, *-ly*, *pre-*, *trans-*, and *un-* are never words by themselves but are always parts of words. These **affixes** are **bound morphemes** and they may attach at the beginning, the end, in the middle, or both at the beginning and end of a word. The humor in the cartoon is Brad's stumbling over the bound morpheme *un-* in a questionable attempt to free it.

Prefixes and Suffixes

We know whether an affix precedes or follows other morphemes, for example that *un-*, *pre-* (*premeditate*, *prejudge*), and *bi-* (*bipolar*, *bisexual*) are prefixes. They occur before other morphemes. Some morphemes occur only as **suffixes**, following other morphemes. English examples of suffix morphemes are *-ing* (*sleeping*, *eating*, *running*, *climbing*), *-er* (*singer*, *performer*, *reader*), *-ist* (*typist*, *pianist*, *novelist*, *linguist*), and *-ly* (*manly*, *sickly*, *friendly*), to mention only a few.

Many languages have prefixes and suffixes, but languages may differ in how they deploy these morphemes. A morpheme that is a prefix in one language may be a suffix in another and vice versa. In English the plural morphemes *-s* and *-es* are suffixes (*boys*, *lasses*). In Isthmus Zapotec, spoken in Mexico, the plural morpheme *ka-* is a prefix:

| | | | |
|-------|------------|---------|-------------|
| zigi | 'chin' | kazigi | 'chins' |
| zike | 'shoulder' | kazike | 'shoulders' |
| diaga | 'ear' | kadiaga | 'ears' |

Languages may also differ in what meanings they express through affixation. In English we do not add an affix to derive a noun from a verb. We have the verb *dance* as in "I like to dance," and we have the noun *dance* as in "There's a dance or two in the old dame yet." The form is the same in both cases. In Turkish, you derive a noun from a verb with the suffix *-ak*, as in the following examples:

| | | | |
|-----|-----------|-------|----------------------------------|
| dur | 'to stop' | durak | 'stopping place' |
| bat | 'to sink' | batak | 'sinking place' or 'marsh/swamp' |

To express reciprocal action in English we use the phrase *each other*, as in *understand each other*, *love each other*. In Turkish a morpheme is added to the verb:

| | | | |
|------|--------------|--------|-------------------------|
| anla | 'understand' | anlash | 'understand each other' |
| sev | 'love' | sevish | 'love each other' |

The reciprocal suffix in these examples is pronounced *sh* after a vowel and *ish* after a consonant. This is similar to the process in English in which we use *a* as the indefinite article morpheme before a noun beginning with a consonant, as in *a dog*, and *an* before a noun beginning with a vowel, as in *an apple*. The same morpheme may have more than one slightly different form (see exercise 6, for example). We will discuss the various pronunciations of morphemes in more detail in chapter 6.

In Piro, an Arawakan language spoken in Peru, a single morpheme, *-kaka*, can be added to a verb to express the meaning ‘cause to’:

| | | | |
|----------|--------------|--------------|--------------------|
| cokoruha | ‘to harpoon’ | cokoruhakaka | ‘cause to harpoon’ |
| salwa | ‘to visit’ | salwakaka | ‘cause to visit’ |

In Karuk, a Native American language spoken in the Pacific Northwest, adding *-ak* to a noun forms the locative adverbial meaning ‘in.’

| | | | |
|----------|---------|------------|--------------|
| ikrivaam | ‘house’ | ikrivaamak | ‘in a house’ |
|----------|---------|------------|--------------|

It is accidental that both Turkish and Karuk have a suffix *-ak*. Despite the similarity in *form*, the two meanings are different. Similarly, the reciprocal suffix *-ish* in Turkish is similar in form to the English suffix *-ish* as in *boyish*.

Similarity in meaning may give rise to different forms. In Karuk the suffix *-ara* has the same meaning as the English *-y*, that is, ‘characterized by’ (*hairly* means ‘characterized by hair’).

| | | | |
|--------|----------|----------|-----------|
| aptiik | ‘branch’ | aptikara | ‘branchy’ |
|--------|----------|----------|-----------|

These examples illustrate again the arbitrary nature of the linguistic sign, that is, of the sound-meaning relationship, as well as the distinction between bound and free morphemes.

Infixes

Some languages also have **infixes**, morphemes that are inserted into other morphemes. Bontoc, spoken in the Philippines, is such a language, as illustrated by the following:

| Nouns/Adjectives | | Verbs | |
|------------------|----------|---------|------------------|
| fikas | ‘strong’ | fumikas | ‘to be strong’ |
| kilad | ‘red’ | kumilad | ‘to be red’ |
| fusul | ‘enemy’ | fumusul | ‘to be an enemy’ |

In this language, the infix *-um-* is inserted after the first consonant of the noun or adjective. Thus, a speaker of Bontoc who knows that *pusi* means ‘poor’ would understand the meaning of *pumusi*, ‘to be poor,’ on hearing the word for the first time, just as an English speaker who learns the verb *sneet* would know that *sneeter* is ‘one who sneets.’ A Bontoc speaker who knows that *ngumitad* means ‘to be dark’ would know that the adjective ‘dark’ must be *ngitad*.

Oddly enough, the only infixes in English are full-word obscenities, usually inserted into adjectives or adverbs. The most common infix in America is the word *fuckin’* and all the euphemisms for it, such as *friggin*, *freakin*, *flippin*, and *fuggin*, as in *ri-fuckin-diculous* or *Kalama-flippin-zoo*, based on the city in Michigan. In Britain, a common infix is *bloody*, an obscene term in British English, and its euphemisms, such as *bloomin’*. In the movie and stage musical *My Fair Lady*, the word *abso-bloomin-lutely* occurs in one of the songs sung by Eliza Doolittle.

Circumfixes

Some languages have **circumfixes**, morphemes that are attached to a base morpheme both initially and finally. These are sometimes called **discontinuous morphemes**. In Chickasaw, a Muskogean language spoken in Oklahoma, the negative is formed by surrounding the affirmative form with both a preceding

ik- and a following *-o* working together as a single negative morpheme. The final vowel of the affirmative is dropped before the negative part *-o* is added. Examples of this circumfixing are:

| Affirmative | | Negative | |
|-------------|-----------------|----------------|------------------------|
| chokma | ‘he is good’ | ik + chokm + o | ‘he isn’t good’ |
| lakna | ‘it is yellow’ | ik + lakn + o | ‘it isn’t yellow’ |
| palli | ‘it is hot’ | ik + pall + o | ‘it isn’t hot’ |
| tiwwi | ‘he opens (it)’ | ik + tiww + o | ‘he doesn’t open (it)’ |

An example of a more familiar circumfixing language is German. The past participle of regular verbs is formed by tacking on *ge-* to the beginning and *-t* to the end of the verb root. This circumfix added to the verb root *lieb* ‘love’ produces *geliebt*, ‘loved’ (or ‘beloved,’ when used as an adjective).

Roots and Stems

Morphologically complex words consist of a morpheme **root** and one or more affixes. Some examples of English roots are *paint* in *painter*, *read* in *reread*, *ceive* in *conceive*, and *ling* in *linguist*. A root may or may not stand alone as a word (*paint* and *read* do; *ceive* and *ling* don’t). In languages that have circumfixes, the root is the form around which the circumfix attaches, for example, the Chickasaw root *chokm* in *ikchokmo* (‘he isn’t good’). In infixing languages the root is the form into which the infix is inserted; for example, *fikas* in the Bontoc word *fumikas* (‘to be strong’).

Semitic languages like Hebrew and Arabic have a unique morphological system. Nouns and verbs are built on a foundation of three consonants, and one derives related words by varying the pattern of vowels and syllables. For example, the root for ‘write’ in Egyptian Arabic is *ktb*, from which the following words (among others) are formed by infixing vowels:

| | |
|---------------|------------|
| katab | ‘he wrote’ |
| kaatib | ‘writer’ |
| kitáab | ‘book’ |
| kútub | ‘books’ |

When a root morpheme is combined with an affix, it forms a **stem**. Other affixes can be added to a stem to form a more complex stem, as shown in the following:

| | | |
|-------------|------------------------------|--|
| root | Chomsky | (proper) noun |
| stem | Chomsky + ite | noun + suffix |
| word | Chomsky + ite + s | noun + suffix + suffix |
| root | believe | verb |
| stem | believe + able | verb + suffix |
| word | un + believe + able | prefix + verb + suffix |
| root | system | noun |
| stem | system + atic | noun + suffix |
| stem | un + system + atic | prefix + noun + suffix |
| stem | un + system + atic + al | prefix + noun + suffix + suffix |
| word | un + system + atic + al + ly | prefix + noun + suffix + suffix + suffix |

With the addition of each new affix, a new stem and a new word are formed. Linguists sometimes use the word **base** to mean any root or stem to which an affix is attached. In the preceding example, *system*, *systematic*, *unsystematic*, and *unsystematical* are bases.

Bound Roots

It had been a rough day, so when I walked into the party I was very chalang, despite my efforts to appear grunted and consolate. I was furling my wieldy umbrella . . . when I saw her. . . She was a descript person. . . Her hair was kempt, her clothing shevelled, and she moved in a gainly way.

JACK WINTER, “How I Met My Wife” by Jack Winter from *The New Yorker*, July 25, 1994. Reprinted by permission of the Estate of Jack Winter.

Bound roots do not occur in isolation and they acquire meaning only in combination with other morphemes. For example, words of Latin origin such as *receive*, *conceive*, *perceive*, and *deceive* share a common root, *-ceive*; and the words *remit*, *permit*, *commit*, *submit*, *transmit*, and *admit* share the root *-mit*. For the original Latin speakers, the morphemes corresponding to *ceive* and *mit* had clear meanings, but for modern English speakers, Latinate morphemes such as *ceive* and *mit* have no independent meaning. Their meaning depends on the entire word in which they occur.

A similar class of words is composed of a prefix affixed to a bound root morpheme. Examples are *ungainly*, but no **gainly*; *discern*, but no **cern*; *nonplussed*, but no **plussed*; *downhearted* but no **hearted*, and others to be seen in this section’s epigraph.

The morpheme *huckle*, when joined with *berry*, has the meaning of a berry that is small, round, and purplish blue; *luke* when combined with *warm* has the meaning ‘somewhat.’ Both these morphemes and others like them (*cran*, *boy-sen*) are bound morphemes that convey meaning only in combination.

Rules of Word Formation

“I never heard of ‘Uglification,’” Alice ventured to say. “What is it?” The Gryphon lifted up both its paws in surprise. “Never heard of uglifying!” it exclaimed. “You know what to beautify is, I suppose?” “Yes,” said Alice doubtfully: “it means—to make—prettier.” “Well, then,” the Gryphon went on, “if you don’t know what to uglify is, you are a simpleton.”

LEWIS CARROLL, *Alice’s Adventures in Wonderland*, 1865

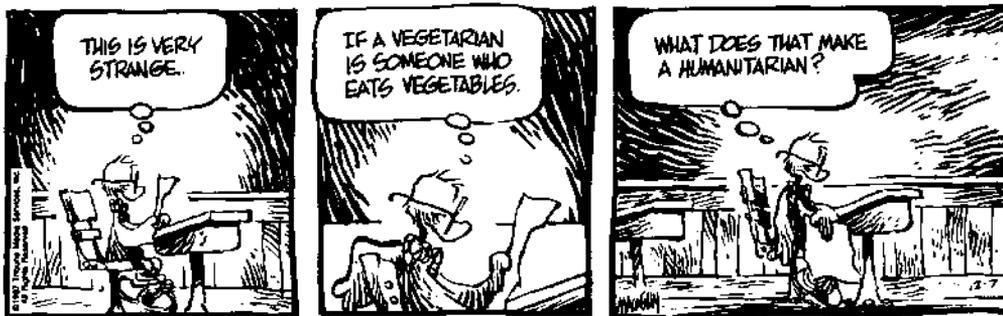
When the Mock Turtle listed the branches of Arithmetic for Alice as “Ambition, Distraction, Uglification, and Derision,” Alice was very confused. She wasn’t really a simpleton, since *uglification* was not a common word in English until Lewis Carroll used it. Still, most English speakers would immediately know the meaning of *uglification* even if they had never heard or used the word before

because they would know the meaning of its individual parts—the root *ugly* and the affixes *-ify* and *-cation*.

We said earlier that knowledge of morphology includes knowledge of individual morphemes, their pronunciation, and their meaning, and knowledge of the rules for combining morphemes into complex words. The Mock Turtle added *-ify* to the adjective *ugly* and formed a verb. Many verbs in English have been formed in this way: *purify*, *amplify*, *simplify*, *falsify*. The suffix *-ify* conjoined with nouns also forms verbs: *objectify*, *glorify*, *personify*. Notice that the Mock Turtle went even further: he added the suffix *-cation* to *uglify* and formed a noun, *uglification*, as in *glorification*, *simplification*, *falsification*, and *purification*. By using the **morphological rules** of English, he created a new word. The rules that he used are as follows:

| | | | |
|------------------------|---|------|-----------------------------------|
| Adjective + <i>ify</i> | → | Verb | ‘to make Adjective’ |
| Verb + <i>cation</i> | → | Noun | ‘the process of making Adjective’ |

Derivational Morphology



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Bound morphemes like *-ify*, *-cation* and *-arian* are called derivational morphemes. When they are added to a base, a new word with a new meaning is derived. The addition of *-ify* to *pure*—*purify*—means ‘to make pure,’ and the addition of *-cation*—*purification*—means ‘the process of making pure.’ If we invent an adjective, *pouzy*, to describe the effect of static electricity on hair, you will immediately understand the sentences “Walking on that carpet really pouzified my hair” and “The best method of pouzification is to rub a balloon on your head.” This means that we must have a list of the derivational morphemes in our mental dictionaries as well as the rules that determine how they are added to a root or stem. The form that results from the addition of a derivational morpheme is called a **derived word**.

Derivational morphemes have clear semantic content. In this sense they are like content words, except that they are not words. As we have seen, when a derivational morpheme is added to a base, it adds meaning. The derived word may also be of a different grammatical class than the original word, as shown by suffixes such as *-able* and *-ly*. When a verb is suffixed with *-able*, the result is an adjective, as in *desire* + *able*. When the suffix *-en* is added to an adjective, a

verb is derived, as in *dark + en*. One may form a noun from an adjective, as in *sweet + ie*. Other examples are:

Noun to Adjective

boy + -ish
virtu + -ous
Elizabeth + -an
pictur + -esque
affection + -ate
health + -ful
alcohol + -ic

Verb to Noun

acquitt + -al
clear + -ance
accus + -ation
sing + -er
conform + -ist
predict + -ion

Adjective to Adverb

exact + -ly

Noun to Verb

moral + -ize
vaccin + -ate
hast + -en
im- + prison
be- + friend
en- + joy
in- + habit

Adjective to Noun

tall + -ness
specific + -ity
feudal + -ism
free + -dom

Verb to Adjective

read + -able
creat + -ive
migrat + -ory
run(n) + -y

Adjective to Verb

en + large
en + dear
en + rich

Some derivational affixes do not cause a change in grammatical class.

Noun to Noun

friend + -ship
human + -ity
king + -dom
New Jersey + -ite
vicar + -age
Paul + -ine
America + -n
libr(ary) + -arian
mono- + theism
dis- + advantage
ex- + wife
auto- + biography
un- + employment

Verb to Verb

un- + do
re- + cover
dis- + believe
auto- + destruct

Adjective to Adjective

pink + -ish
red + -like
a- + moral
il- + legal
in- + accurate
un- + happy
semi- + annual
dis- + agreeable
sub- + minimal

When a new word enters the lexicon by the application of morphological rules, other complex derivations may be **blocked**. For example, when *Commun + ist* entered the language, words such as *Commun + ite* (as in *Trotsky + ite*) or *Commun + ian* (as in *grammar + ian*) were not needed; their formation was blocked. Sometimes, however, alternative forms do coexist: for example, *Chomskyan* and *Chomskyist* and perhaps even *Chomskyite* (all meaning ‘follower of Chomsky’s

views of linguistics’). *Semanticist* and *semantician* are both used for linguists who study meaning in language, but the possible word *semantite* is not.

Finally, derivational affixes appear to come in two classes. In one class, the addition of a suffix triggers subtle changes in pronunciation. For example, when we affix *-ity* to *specific* (pronounced “spezifik” with a *k* sound), we get *specificity* (pronounced “spezifisity” with an *s* sound). When deriving *Elizabeth* + *-an* from *Elizabeth*, the fourth vowel sound changes from the vowel in *Beth* to the vowel in *Pete*. Other suffixes such as *-y*, *-ive*, and *-ize* may induce similar changes: *sane/sanity*, *deduce/deductive*, *critic/criticize*.

On the other hand, suffixes such as *-er*, *-ful*, *-ish*, *-less*, *-ly*, and *-ness* may be tacked onto a base word without affecting the pronunciation, as in *baker*, *wishful*, *boyish*, *needless*, *sanely*, and *fullness*. Moreover, affixes from the first class cannot be attached to a base containing an affix from the second class: **need + less + ity*, **moral + ize + ive*; but affixes from the second class may attach to bases with either kind of affix: *moral + iz(e) + er*, *need + less + ness*.

Inflectional Morphology



Zits Partnership/King Features Syndicate

Function words like *to*, *it*, and *be* are free morphemes. Many languages, including English, also have bound morphemes that have a strictly grammatical function. They mark properties such as tense, number, person, and so forth. Such bound morphemes are called **inflectional morphemes**. Unlike derivational morphemes, they never change the grammatical category of the stems to which they are attached. Consider the forms of the verb in the following sentences:

1. I sail the ocean blue.
2. He sails the ocean blue.
3. John sailed the ocean blue.
4. John has sailed the ocean blue.
5. John is sailing the ocean blue.

In sentence (2) the *-s* at the end of the verb is an agreement marker; it signifies that the subject of the verb is third-person and is singular, and that the verb is in the present tense. It doesn’t add lexical meaning. The suffix *-ed* indicates past tense, and is also required by the syntactic rules of the language when verbs are used with *have*, just as *-ing* is required when verbs are used with forms of *be*.

Inflectional morphemes represent relationships between different parts of a sentence. For example, *-s* expresses the relationship between the verb and the third-person singular subject; *-ed* expresses the relationship between the time the utterance is spoken (e.g., now) and the time of the event (past). If you say “John danced,” the *-ed* affix places the activity before the utterance time. Inflectional morphology is closely connected to the syntax and semantics of the sentence.

English also has other inflectional endings, such as the plural suffix, which is attached to certain singular nouns, as in *boy/boys* and *cat/cats*. In contrast to Old and Middle English, which were more richly inflected languages, as we discuss in chapter 8, Modern English has only eight bound inflectional affixes:

| English Inflectional Morphemes | Examples |
|---|------------------------------------|
| -s third-person singular present | She wait-s at home. |
| -ed past tense | She wait-ed at home. |
| -ing progressive | She is eat-ing the donut. |
| -en past participle | Mary has eat-en the donuts. |
| -s plural | She ate the donut-s. |
| -’s possessive | Disa’s hair is short. |
| -er comparative | Disa has short-er hair than Karin. |
| -est superlative | Disa has the short-est hair. |

Inflectional morphemes in English follow the derivational morphemes in a word. Thus, to the derivationally complex word *commit + ment* one can add a plural ending to form *commit + ment + s*, but the order of affixes may not be reversed to derive the impossible *commit + s + ment = *commitment*.

Yet another distinction between inflectional and derivational morphemes is that inflectional morphemes are **productive**: they apply freely to nearly every appropriate base (except “irregular” forms such as *feet*, not **foots*). Most nouns take an *-s* inflectional suffix to form a plural, but only some nouns take the derivational suffix *-ize* to form a verb: *idolize*, but not **picturize*.

Compared to many languages of the world, English has relatively little inflectional morphology. Some languages are highly inflected. In Swahili, which is widely spoken in eastern Africa, verbs can be inflected with multiple morphemes, as in *kimeanguka* (*ki + me + anguka*), meaning ‘it has fallen.’ Here the verb root *anguka* meaning ‘fall’ has two inflectional prefixes: *ki-* meaning ‘it’ and *me* meaning ‘completed action.’

Even the more familiar European languages have many more inflectional endings than English. In the Romance languages (languages descended from Latin), the verb has different inflectional endings depending on the subject of the sentence. The verb is inflected to agree in person and number with the subject, as illustrated by the Italian verb *parlare* meaning ‘to speak’:

| | | | |
|---------------|---------------------------|--------------|-------------------------|
| Io parlo | ‘I speak’ | Noi parliamo | ‘We speak’ |
| Tu parli | ‘You (singular) speak’ | Voi parlate | ‘You (plural) speak’ |
| Lui/Lei parla | ‘He/she speaks’ | Loro parlano | ‘They speak’ |

Russian has a system of inflectional suffixes for nouns that indicates the nouns grammatical relation—whether a subject, object, possessor, and so on—something English does with word order. For example, in English, the sentence

Maxim defends Victor means something different from *Victor defends Maxim*. The order of the words is critical. But in Russian, all of the following sentences mean ‘Maxim defends Victor’ (the *č* is pronounced like the *ch* in cheese; the *š* like the *sh* in shoe; the *j* like the *y* in yet):

Maksim zašiščajt Viktora.
 Maksim Viktora zašiščajet.
 Viktora Maksim zašiščajet.
 Viktora zašiščajet Maksim.

The inflectional suffix *-a* added to the name *Viktor* to derive *Viktora* shows that Victor, not Maxim, is defended. The suffix designates the object of the verb, irrespective of word order.

The grammatical relation of a noun in a sentence is called the **case** of the noun. When case is marked by inflectional morphemes, the process is referred to as **case morphology**. Russian has a rich case morphology, whereas English case morphology is limited to the one possessive *-s* and its system of pronouns. Many of the grammatical relations that Russian expresses with its case morphology are expressed in English with prepositions.

Among the world’s languages is a richness and variety of inflectional processes. Earlier we saw how German uses circumfixes to inflect a verb stem to produce a past participle: *lieb* to *geliebt*, similar to the *-ed* ending of English. Arabic infixes vowels for inflectional purposes: *kitāb* ‘book’ but *kūtub* ‘books.’ Samoan (see exercise 10) uses a process of **reduplication**—inflecting a word through the repetition of part or all of the word: *savali* ‘he travels,’ but *savavali* ‘they travel.’ Malay does the same with whole words: *orang* ‘person,’ but *orang orang* ‘people.’ Languages such as Finnish have an extraordinarily complex case morphology, whereas Mandarin Chinese lacks case morphology entirely.

Inflection achieves a variety of purposes. In English verbs are inflected with *-s* to show third-person singular agreement. Languages like Finnish and Japanese have a dazzling array of inflectional processes for conveying everything from ‘temporary state of being’ (Finnish nouns) to ‘strong negative intention’ (Japanese verbs). English spoken 1,000 years ago had considerably more inflectional morphology than Modern English, as we shall discuss in chapter 8.

In distinguishing inflectional from derivational morphemes in Modern English we may summarize in the table below and the Figure (2.1) that follows it:

| Inflectional | Derivational |
|---|--|
| Grammatical function | Lexical function |
| No word class change | May cause word class change |
| Small or no meaning change | Some meaning change |
| Often required by rules of grammar | Never required by rules of grammar |
| Follow derivational morphemes in a word | Precede inflectional morphemes in a word |
| Productive | Some productive, many nonproductive |

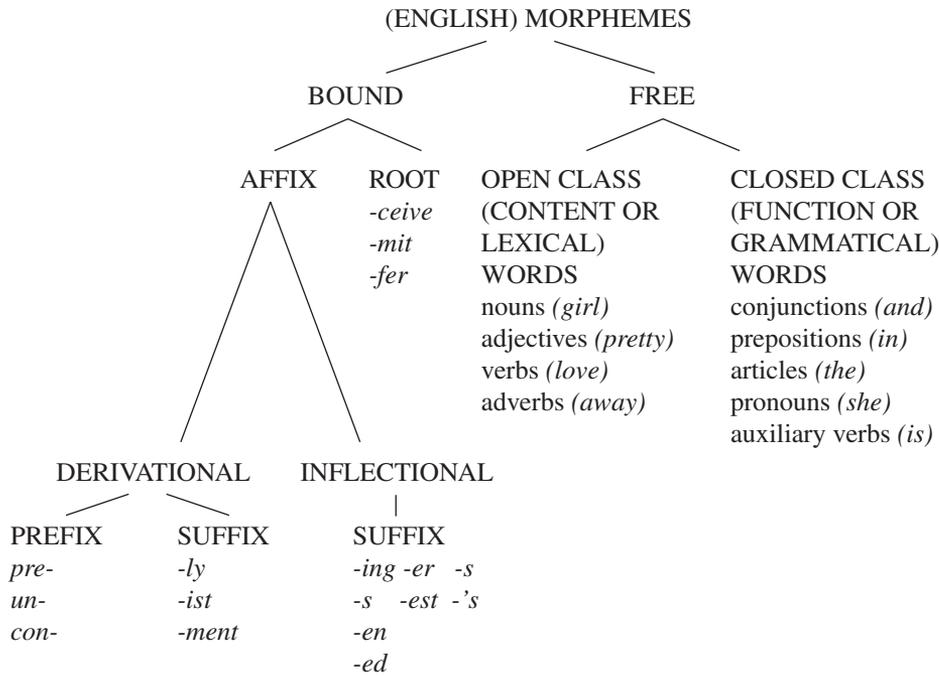
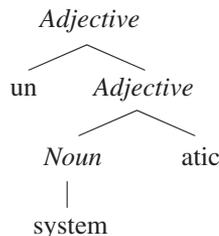


FIGURE 2.1 | Classification of English morphemes.

The Hierarchical Structure of Words

We saw earlier that morphemes are added in a fixed order. This order reflects the *hierarchical structure* of the word. A word is not a simple sequence of morphemes. It has an internal structure. For example, the word *unsystematic* is composed of three morphemes: *un-*, *system*, and *-atic*. The root is *system*, a noun, to which we add the suffix *-atic*, resulting in an adjective, *systematic*. To this adjective, we add the prefix *un-*, forming a new adjective, *unsystematic*.

In order to represent the hierarchical organization of words (and sentences), linguists use **tree diagrams**. The tree diagram for *unsystematic* is as follows:



This tree represents the application of two morphological rules:

1. Noun + atic → Adjective
2. un + Adjective → Adjective

Rule 1 attaches the derivational suffix *-atic* to the root noun, forming an adjective. Rule 2 takes the adjective formed by rule 1 and attaches the derivational prefix *un-*. The diagram shows that the entire word—*unsystematic*—is an adjective that is composed of an adjective—*systematic*—plus *un*. The adjective is itself composed of a noun—*system*—plus the suffix *-atic*.

Hierarchical structure is an essential property of human language. Words (and sentences) have component parts, which relate to each other in specific, rule-governed ways. Although at first glance it may seem that, aside from order, the morphemes *un-* and *-atic* each relate to the root *system* in the same way, this is not the case. The root *system* is “closer” to *-atic* than it is to *un-*, and *un-* is actually connected to the adjective *systematic*, and not directly to *system*. Indeed, **unsystem* is not a word.

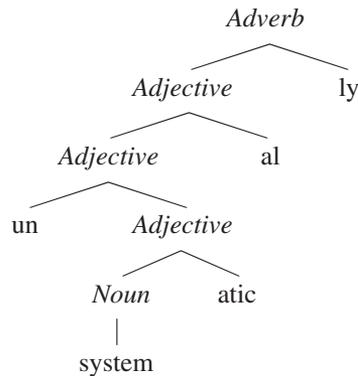
Further morphological rules can be applied to the given structure. For example, English has a derivational suffix *-al*, as in *egotistical*, *fantastical*, and *astronomical*. In these cases, *-al* is added to an adjective—*egotistic*, *fantastic*, *astronomic*—to form a new adjective. The rule for *-al* is as follows:

3. Adjective + al → Adjective

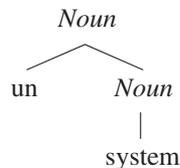
Another affix is *-ly*, which is added to adjectives—*happy*, *lazy*, *hopeful*—to form adverbs *happily*, *lazily*, *hopefully*. Following is the rule for *-ly*:

4. Adjective + ly → Adverb

Applying these two rules to the derived form *unsystematic*, we get the following tree for *unsystematically*:



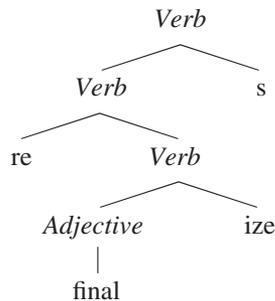
This is a rather complex word. Despite its complexity, it is well-formed because it follows the morphological rules of the language. On the other hand, a very simple word can be ungrammatical. Suppose in the above example we first added *un-* to the root *system*. That would have resulted in the nonword **unsystem*.



**Unsystem* is not a possible word because the rule of English that allows *un-* to be added to nouns is restricted to very few cases, and those always nouns that already have a suffix such as *un + employment*, *un + acceptance* or *un + feasibility*. The large soft-drink company whose ad campaign promoted the *Uncola* successfully flouted this linguistic rule to capture people's attention. Part of our linguistic competence includes the ability to recognize possible versus impossible words, like **unsystem* and **Uncola*. Possible words are those that conform to the rules; impossible words are those that do not.

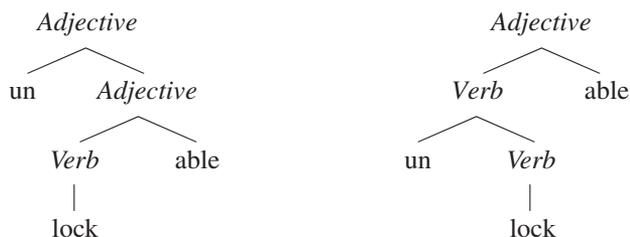
Tree diagrams make explicit the way speakers represent the internal structure of the morphologically complex words in their language. In speaking and writing, we appear to string morphemes together sequentially as in *un + system + atic*. However, our mental representation of words is hierarchical as well as linear, and this is shown by tree diagrams.

Inflectional morphemes are equally well represented. The following tree shows that the inflectional agreement morpheme *-s* follows the derivational morphemes *-ize* and *re-* in *refinalizes*:



The tree also shows that *re-* applies to *finalize*, which is correct as **refinal* is not a word, and that the inflectional morpheme follows the derivational morpheme.

The hierarchical organization of words is even more clearly shown by structurally ambiguous words, words that have more than one meaning by virtue of having more than one structure. Consider the word *unlockable*. Imagine you are inside a room and you want some privacy. You would be unhappy to find the door is *unlockable*—‘not able to be locked.’ Now imagine you are inside a locked room trying to get out. You would be very relieved to find that the door is *unlockable*—‘able to be unlocked.’ These two meanings correspond to two different structures, as follows:

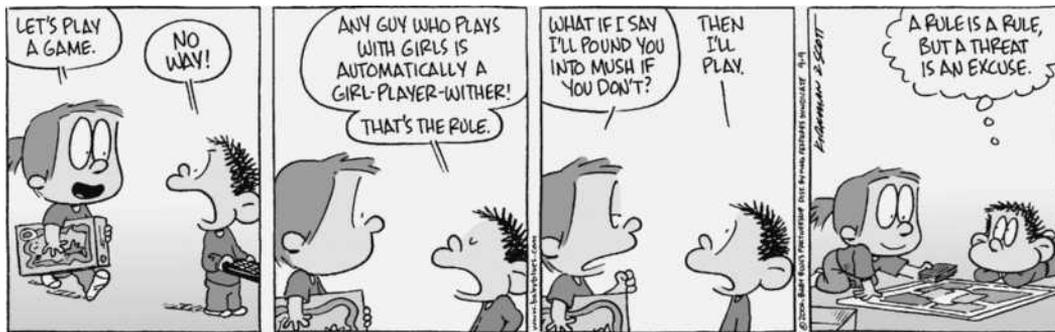


In the first structure the verb *lock* combines with the suffix *-able* to form an adjective *lockable* ('able to be locked'). Then the prefix *un-*, meaning 'not,' combines with the derived adjective to form a new adjective *unlockable* ('not able to be locked'). In the second case, the prefix *un-* combines with the verb *lock* to form a derived verb *unlock*. Then the derived verb combines with the suffix *-able* to form *unlockable*, 'able to be unlocked.'

An entire class of words in English follows this pattern: *unbuttonable*, *unzip-pable*, and *unlatchable*, among others. The ambiguity arises because the prefix *un-* can combine with an adjective, as illustrated in rule 2, or it can combine with a verb, as in *undo*, *unstable*, *unearth*, and *unloosen*.

If words were only strings of morphemes without any internal organization, we could not explain the ambiguity of words like *unlockable*. These words also illustrate another key point, which is that structure is important to determining meaning. The same three morphemes occur in both versions of *unlockable*, yet there are two distinct meanings. The different meanings arise because of the different structures.

Rule Productivity



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"Curiouser and curiouser!" cried Alice (she was so much surprised, that for the moment she quite forgot how to speak good English).

LEWIS CARROLL, *Alice's Adventures in Wonderland*, 1865

We have noted that some morphological processes, inflection in particular, are productive, meaning that they can be used freely to form new words from the list of free and bound morphemes. Among derivational morphemes, the suffix *-able* can be conjoined with any verb to derive an adjective with the meaning of the verb and the meaning of *-able*, which is something like 'able to be' as in *accept + able*, *laugh + able*, *pass + able*, *change + able*, *breathe + able*, *adapt + able*, and so on. The productivity of this rule is illustrated by the fact that we find *-able* affixed to new verbs such as *downloadable* and *faxable*.

The prefix *un-* derives same-class words with an opposite meaning: *unafraid*, *unfit*, *un-American*, and so on. Additionally, *un-* can be added to derived adjectives

that have been formed by morphological rules, resulting in perfectly acceptable words such as *un* + *believe* + *able* or *un* + *pick* + *up* + *able*.

Yet *un-* is not fully productive. We find *happy* and *unhappy*, *cowardly* and *uncowardly*, but not *sad* and **unsad*, *brave* and **unbrave*, or *obvious* and **unobvious*. It appears that the “*un*-Rule” is most productive for adjectives that are derived from verbs, such as *unenlightened*, *unsimplified*, *uncharacterized*, *unauthorized*, *undistinguished*, and so on. It also appears that most acceptable *un*-words have polysyllabic bases, and while we have *unfit*, *uncool*, *unread*, and *unclean*, many of the unacceptable *un*- forms have monosyllabic stems such as **unbig*, **ungreat*, **unred*, **unsad*, **unsmall*, **untall*.

The rule that adds an *-er* to verbs in English to produce a noun meaning ‘one who does’ is a nearly productive morphological rule, giving us *examiner*, *exam-taker*, *analyzer*, *lover*, *hunter*, and even *girlplayerwith*, as the cartoon illustrates, but fails full productivity owing to “unwords” like **chairer*, which is not ‘one who chairs.’

The “other” *-er* suffix, the one that means ‘more’ as in *greedier*, also fails to be entirely productive as Alice’s **curiouser* points out. The more syllables a word has, the less likely *-er* will work and we will need the word *more*, as in *more beautiful* (but not **beautifuler*) compared with the well-formed *nicer* or *prettier*.

Other derivational morphemes fall farther short of productivity. Consider:

| | | |
|------------------|------|----------------|
| <i>sincerity</i> | from | <i>sincere</i> |
| <i>warmth</i> | from | <i>warm</i> |
| <i>moisten</i> | from | <i>moist</i> |

The suffix *-ity* is found in many other words in English, like *chastity*, *scarcity*, and *curiosity*; and *-th* occurs in *health*, *wealth*, *depth*, *width*, and *growth*. We find *-en* in *sadden*, *ripen*, *redde*n, *weaken*, and *deepen*. Still, the phrase “‘The tragedy of Hamlet’ sounds somewhat strange, as does “‘I’m going to *heaten* the sauce.” Someone may say *coolth*, but when “words” like *tragicity*, *heaten*, and *coolth* are used, it is usually either a slip of the tongue or an attempt at humor. Most adjectives will not accept any of these derivational suffixes.

Even less productive to the point of rareness are such derivational morphemes as the diminutive suffixes in the words *pig* + *let* and *sap* + *ling*.

In the morphologically complex words that we have seen so far, we can generally predict the meaning based on the meanings of the morphemes that make up the word. *Unhappy* means ‘not happy’ and *acceptable* means ‘fit to be accepted.’ However, one cannot always know the meaning of the words derived from free and derivational morphemes by knowing the morphemes themselves. The following *un*- forms have unpredictable meanings:

| | |
|----------|---|
| unloosen | ‘loosen, let loose’ |
| unrip | ‘rip, undo by ripping’ |
| undo | ‘reverse doing’ |
| untread | ‘go back through in the same steps’ |
| unearth | ‘dig up’ |
| unfrock | ‘deprive (a cleric) of ecclesiastic rank’ |
| unnerv | ‘fluster’ |

Morphologically complex words whose meanings are not predictable must be listed individually in our mental lexicons. However, the morphological rules must also be in the grammar, revealing the relation between words and providing the means for forming new words.

Exceptions and Suppletions

The exception gives Authority to the Rule

GIOVANNI TORRIANO, *A Common Place of Italian Proverbs*, 1666

The morphological rule that forms plural nouns from singular nouns does not apply to words like *child*, *man*, *foot*, and *mouse*. These words are exceptions to the rule. Similarly, verbs like *go*, *sing*, *bring*, *run*, and *know* are exceptions to the inflectional rule for producing past-tense verbs in English.

When children are learning English, they first learn the regular rules, which they apply to all forms. Thus, we often hear them say *mans* and *goed*. Later in the acquisition process, they specifically learn irregular plurals like *men* and *mice*, and irregular past tense forms like *came* and *went*. These children's errors are actually evidence that the regular rules exist. This is discussed more fully in chapter 9.

Irregular, or **suppletive**, forms are treated separately in the grammar. You cannot use the regular rules to add affixes to words that are exceptions like *child/children*, but must replace the uninflected form with another word. For regular words only the singular form need be specifically stored in the lexicon because we can use the inflectional rules to form plurals. But this can't be so with suppletive exceptions, and *children*, *mice*, and *feet* must be learned separately. The same is true for suppletive past tense forms and comparative forms. There are regular rules—suffixes *-ed* and *-er*—to handle most cases such as *walked* and *taller*, but words like *went* and *worse* need to be learned individually as meaning 'goed' and 'badder.'

When a new word enters the language, the regular inflectional rules generally apply. The plural of *geek*, when it was a new word in English, was *geeks*, not **geeken*, although we are advised that some geeks wanted the plural of *fax* to be **faxen*, like *oxen*, when *fax* entered the language as a shortened form of *facsimile*. Never fear: its plural is *faxes*. The exception to this may be a word "borrowed" from a foreign language. For example, the plural of Latin *datum* has always been *data*, never *datums*, though nowadays *data*, the one-time plural, is treated by many as a singular word like *information*.

The past tense of the verb *hit*, as in the sentence *Yesterday you hit the ball*, and the plural of the noun *sheep* as in *The sheep are in the meadow*, show that some morphemes have no phonological shape at all. We know that *hit* in the above sentence is *hit* + *past* because of the time adverb *yesterday*, and we know that *sheep* is the phonetic form of *sheep* + *plural* because of the plural verb form *are*.

When a verb is derived from a noun, even if it is pronounced the same as an irregular verb, the regular rules apply to it. Thus *ring*, when used in the sense of encircle, is derived from the noun *ring*, and as a verb it is regular. We say

the police ringed the bank with armed men, not *rang the bank with armed men. In the jargon of baseball one says that the hitter *flied out* (hit a lofty ball that was caught), rather than *flew out, because the verb came from the compound noun *fly ball*.

Indeed, when a noun is used in a compound in which its meaning is lost, such as *flatfoot*, meaning ‘cop,’ its plural follows the regular rule, so one says *two flatfoots* to refer to a pair of cops slangily, not *two flatfeet. It’s as if the noun is saying: “If you don’t get your meaning from me, you don’t get my special plural form.”

Making compounds plural, however, is not always simply adding -s as in *girlfriends* or *sheepdogs*. For many speakers the plural of *mother-in-law* is *mothers-in-law*, whereas the possessive form is *mother-in-law’s*; the plural of *court-martial* is *courts-martial* and the plural of *attorney general* is *attorneys general* in a legal setting, but for most of the rest of us it is *attorney generals*. If the rightmost word of a compound takes an irregular form, however, the entire compound generally follows suit, so the plural of *footman* is *footmen*, not *footmans or *feetman or *feetmen.

Lexical Gaps



United Feature Syndicate

The vast majority of letter (sound) sequences that could be words of English—*clunt*, *spleek*, *flig*—are not. Similar comments apply to morphological derivations like *disobvious* or *inobvious*. “Words” that conform to the rules of word formation but are not truly part of the vocabulary are called **accidental gaps** or **lexical gaps**. Accidental gaps are well-formed but non-existing words.

The actual words in a language constitute a mere subset of the possible words. There are always gaps in the lexicon—words not present but that could be added. Some of the gaps are due to the fact that a permissible sound sequence has no meaning attached to it (like *blick*, or *slarm*, or *krobe*). The sequence of sounds must be in keeping with the constraints of the language, however; **bnick* is not a “gap” because no word in English can begin with *bn*. We will discuss such constraints in chapter 6.

Other gaps result when possible combinations of morphemes never come into use. Speakers can distinguish between impossible words such as **unsystem* and **needlessness* and possible but nonexistent words such as *magnificenter* or *disobvious* (cf. *distrustful*). The latter are blocked, as noted earlier, owing to the presence of *more magnificent* and *nonobvious*. The ability to make this distinction is further evidence that the morphological component of our mental grammar consists of not just a lexicon—a list of existing words—but also of rules that enable us to create and understand new words, and to recognize possible and impossible words.

Other Morphological Processes

The various kinds of affixation that we have discussed are by far the most common morphological processes among the world’s languages. But, as we continue to emphasize in this book, the human language capacity is enormously creative, and that creativity extends to ways other than affixation in which words may be altered and created.

Back-Formations

[A girl] was delighted by her discovery that *eats* and *cats* were really *eat* + *-s* and *cat* + *-s*. She used her new suffix snipper to derive *mik* (mix), *upstair*, *downstair*, *clo* (clothes), *len* (lens), *brefek* (from *brefeks*, her word for breakfast), *trappy* (trapeze), even *Santa Claw*.

STEVEN PINKER, *Words and Rules: The Ingredients of Language*, 1999

Misconception can sometimes be creative, and nothing in this world both misconceives and creates like a child, as we shall see in chapter 9. A new word may enter the language because of an incorrect morphological analysis. For example, *peddle* was derived from *peddler* on the mistaken assumption that the *-er* was the agentive suffix. Such words are called **back-formations**. The verbs *hawk*, *stoke*, *swindle*, *burgle* and *edit* all came into the language as back-formations—of *hawker*, *stoker*, *swindler*, *burglar* and *editor*. *Pea* was derived from a singular word, *pease*, by speakers who thought *pease* was a plural.

Some word creation comes from deliberately miscast back-formations. The word *bikini* comes from the Bikini atoll of the Marshall Islands. Because the first syllable *bi-* is a morpheme meaning ‘two’ in words like *bicycle*, some clever person called a topless bathing suit a *monokini* and a tank top with a bikini bottom a *tankini*. Historically, a number of new words have entered the English lexicon in a similar way, some of the most recent being the *appletini*, *chocotini*, *mintini* and *God-knows-what-else-tini* to be found as

flavor additives to the traditional martini libation. Based on analogy with such pairs as *act/action*, *exempt/exemption*, and *revise/revision*, new words *resurrect*, *preempt*, and *televise* were formed from the existing words *resurrection*, *preemption*, and *television*.

Language purists sometimes rail against back-formations and cite *enthuse* and *liaise* (from *enthusiasm* and *liaison*) as examples of language corruption. However, language is not corrupt; it is adaptable and changeable. Don't be surprised to discover in your lifetime that *shevelled* and *chalant* have infiltrated the English language (from *disheveled* and *nonchalant*) to mean 'tidy' and 'concerned,' and if it happens do not cry "havoc" and let slip the dogs of prescriptivism; all will be well.

Compounds

[T]he Houyhnhms have no Word in their Language to express any thing that is evil, except what they borrow from the Deformities or ill Qualities of the Yahoos. Thus they denote the Folly of a Servant, an Omission of a Child, a Stone that cuts their feet, a Continuance of foul or unseasonable Weather, and the like, by adding to each the Epithet of Yahoo. For instance, Hnhm Yahoo, Whnaholm Yahoo, Ynlhmnawihlma Yahoo, and an ill contrived House, Ynholmhnrohlnw Yahoo.

JONATHAN SWIFT, *Gulliver's Travels*, 1726

Two or more words may be joined to form new, compound words. English is very flexible in the kinds of combinations permitted, as the following table of compounds shows.

| | Adjective | Noun | Verb |
|-----------|-------------|------------|-----------|
| Adjective | bittersweet | poorhouse | whitewash |
| Noun | headstrong | homework | spoonfeed |
| Verb | feel-good | pickpocket | sleepwalk |

Some compounds that have been introduced fairly recently into English are *Facebook*, *LinkedIn*, *android apps*, *m-commerce*, and *crowdsourcing* (the practice of obtaining information from a large group of people who contribute online).

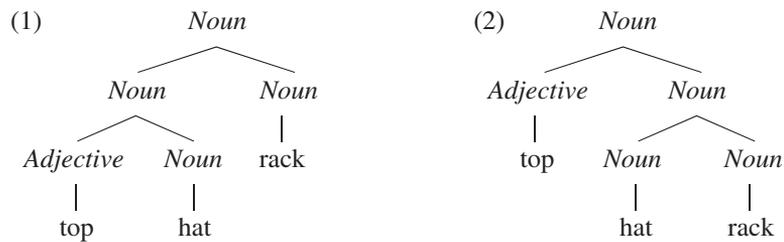
When the two words are in the same grammatical category, the compound will also be in this category: noun + noun = noun, as in *girlfriend*, *fighter-bomber*, *paper clip*, *elevator-operator*, *landlord*, *mailman*; adjective + adjective = adjective, as in *icy-cold*, *red-hot*, *worldly wise*. In English, the rightmost word in a compound is the **head** of the compound. The head is the part of a word or phrase that determines its broad meaning and grammatical category. Thus, when the two words fall into different categories, the class of the second or final word determines the grammatical category of the compound: noun + adjective = adjective, as in *headstrong*; verb + noun = noun, as in *pick-pocket*. On the other hand, compounds formed with a preposition are in the category of the nonprepositional part of the compound, such as (to) *overtake* or (the) *sundown*. This is further evidence that prepositions form a closed-class category that does not readily admit new members.

Although two-word compounds are the most common in English, it would be difficult to state an upper limit: Consider *three-time loser*, *four-dimensional*

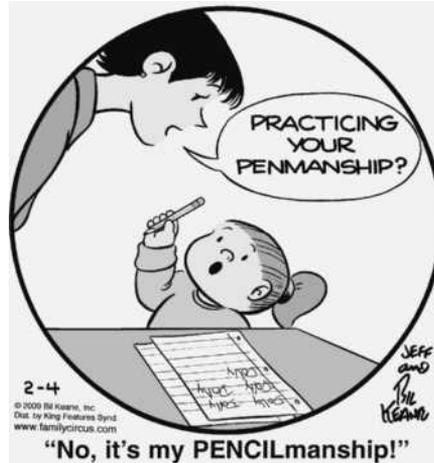
space-time, *sergeant-at-arms*, *mother-of-pearl*, *man about town*, *master of ceremonies*, and *daughter-in-law*. Dr. Seuss uses the rules of compounding when he explains “when tweetle beetles battle with paddles in a puddle, they call it a tweetle beetle puddle paddle battle.”³

Spelling does not tell us what sequence of words constitutes a compound; whether a compound is spelled with a space between the two words, with a hyphen, or with no separation at all depends on the idiosyncrasies of the particular compound, as shown, for example, in *blackbird*, *six-pack*, and *smoke screen*.

Like derived words, compounds have internal structure. This is clear from the ambiguity of a compound like *top + hat + rack*, which can mean ‘a rack for top hats’ corresponding to the structure in tree diagram (1), or ‘the highest hat rack,’ corresponding to the structure in (2).



Meaning of Compounds



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The meaning of a compound is not always the sum of the meanings of its parts; a *blackboard* may be green or white. Not everyone who wears a red coat is a

³From FOX IN SOCKS by Dr. Seuss, Trademark™ & copyright© by Dr. Seuss Enterprises, L.P., 1965, renewed 1993. Used by permission of Random House Children’s Books, a division of Random House, Inc., International Creative Management, and HarperCollins Publishers, Ltd., UK.

Redcoat (slang for British soldier during the American Revolutionary War). The difference between the sentences “She has a red coat in her closet” and “She has a Redcoat in her closet” would have been highly significant in America in 1776.

Other compounds reveal other meaning relations between the parts, which are not entirely consistent because many compounds are idiomatic (idioms are discussed in chapter 4). A *boathouse* is a house for boats, but a *cathouse* is not a house for cats. (It is slang for a house of prostitution or whorehouse.) A *jumping bean* is a bean that jumps, a *falling star* is a star that (appears to) fall, and a *magnifying glass* is a glass that magnifies; but a *looking glass* is not a glass that looks, nor is an *eating apple* an apple that eats, and *laughing gas* does not laugh. *Peanut oil* and *olive oil* are oils made from something, but what about *baby oil*? And is this a contradiction: “horse meat is dog meat”? Not at all, since the first is meat *from* horses and the other is meat *for* dogs.

In the examples so far, the meaning of each compound includes at least to some extent the meanings of the individual parts. However, many compounds nowadays do not seem to relate to the meanings of the individual parts at all. A *jack-in-a-box* is a tropical tree, and a *turncoat* is a traitor. A *highbrow* does not necessarily have a high brow, nor does a *bigwig* have a big wig, nor does an *egghead* have an egg-shaped head.

Like certain words with the prefix *un-*, the meaning of many compounds must be learned as if they were individual whole words. Some of the meanings may be figured out, but not all. If you had never heard the word *hunchback*, it might be possible to infer the meaning; but if you had never heard the word *flat-foot*, it is doubtful you would know it means ‘detective’ or ‘policeman,’ even though the origin of the word, once you know the meaning, can be figured out.

The pronunciation of English compounds differs from the way we pronounce the sequence of two words that are not compounded. In an actual compound, the first word is usually stressed (pronounced somewhat louder and higher in pitch), and in a noncompound phrase the second word is stressed. Thus we stress *Red* in *Redcoat* but *coat* in *red coat*. (Stress, pitch, and other similar features are discussed in chapters 5 and 6.)

Universality of Compounding

Other languages have rules for conjoining words to form compounds, as seen by French *cure-dent*, ‘toothpick’; German *Panzerkraftwagen*, ‘armored car’; Russian *cetyrexetaznyi*, ‘four-storied’; and Spanish *tocadiscos*, ‘record player.’ In the Native American language Tohono O’odham, the word meaning ‘thing’ is *haʔichu*, and it combines with *doakam*, ‘living creatures,’ to form the compound *haʔichu doakam*, ‘animal life.’

In Twi, by combining the word meaning ‘son’ or ‘child,’ *ɔba*, with the word meaning ‘chief,’ *ɔhene*, one derives the compound *ɔheneba*, meaning ‘prince.’ By adding the word ‘house,’ *ofi*, to *ɔhene*, the word meaning ‘palace,’ *ahemfi*, is derived. The other changes that occur in the Twi compounds are due to phonological and morphological rules in the language.

In Thai, the word ‘cat’ is *mɛɛw*, the word for ‘watch’ (in the sense of ‘to watch over’) is *fâw*, and the word for ‘house’ is *bâan*. The word for ‘watch cat’ (like a watchdog) is the compound *mɛɛwfâwbâan*—literally, ‘catwatchhouse.’

Compounding is a common and frequent process for enlarging the vocabulary of all languages.

“Pullet Surprises”

Our knowledge of the morphemes and morphological rules of our language is often revealed by the “errors” we make. We may guess the meaning of a word we do not know. Sometimes we guess wrong, but our wrong guesses are nevertheless “intelligent.”

Amsel Greene collected errors made by her students in vocabulary-building classes and published them in a book called *Pullet Surprises*.⁴ The title is taken from a sentence written by one of her high school students: “In 1957 Eugene O’Neill won a Pullet Surprise.” What is most interesting about these errors is how much they reveal about the students’ knowledge of English morphology. The creativity of these students is illustrated in the following examples:

| Word | Student’s Definition |
|---------------|------------------------------|
| deciduous | ‘able to make up one’s mind’ |
| longevity | ‘being very tall’ |
| fortuitous | ‘well protected’ |
| gubernatorial | ‘to do with peanuts’ |
| bibliography | ‘holy geography’ |
| adamant | ‘pertaining to original sin’ |
| diatribe | ‘food for the whole clan’ |
| polyglot | ‘more than one glot’ |
| gullible | ‘to do with sea birds’ |
| homogeneous | ‘devoted to home life’ |

The student who used the word *indefatigable* in the sentence

She tried many reducing diets, but remained indefatigable.

clearly shows morphological knowledge: *in* meaning ‘not’ as in *ineffective*; *de* meaning ‘off’ as in *decapitate*; ‘fat’ as in *fat*; *able* as in *able*; and combined meaning, ‘not able to take the fat off.’ Our contribution to Greene’s collection is *metronome*: ‘a city-dwelling diminutive troll; and *oxymoron*: ‘a really stupid cow.’

Sign Language Morphology

Sign languages are rich in morphology. They have root and affix morphemes, free and bound morphemes, lexical content and grammatical morphemes, derivational and inflectional morphemes, and morphological rules for their combination to form morphologically complex signs. The affixation is accomplished by preceding or following a particular gesture with another “affixing” gesture.

⁴Greene, A. 1969. *Pullet surprises*. Glenview, IL: Scott, Foresman.

The suffix meaning ‘negation,’ roughly analogous to *un-* or *non-* or *dis-*, is accomplished as a rapid turning over of the hand(s) following the end of the root sign that is being negated. For example, ‘want’ is signed with open palms facing upward; ‘don’t want’ follows that gesture with a turning of the palms to face downward. This ‘reversal of orientation’ suffix may be applied, with necessary adjustments, to many root signs.

In sign language many morphological processes are not linear. Rather, the sign stem occurs nested within various movements and locations in signing space so that the gestures are simultaneous, an impossibility with spoken languages.

Inflection of sign roots also occurs in ASL and all other sign languages, which characteristically modify the movement of the hands and the spatial contours of the area near the body in which the signs are articulated. For example, movement away from the signer’s body toward the “listener” might inflect a verb as in “I see you,” whereas movement away from the listener and toward the body would inflect the verb as in “you see me.”

Morphological Analysis: Identifying Morphemes

Case study 1

As we have seen in this chapter, speakers of a language know the internal structure of words because they know the morphemes of their language and the rules for their combination. This is unconscious knowledge of course and it takes a trained linguist to make this knowledge explicit as part of a descriptive grammar of the language. The task is challenging enough when the language you are analyzing is your own, but linguists who speak one language may nevertheless analyze languages for which they are not native speakers.

Suppose you were a linguist from the planet Zorx who wanted to analyze English. How would you discover the morphemes of the language? How would you determine whether a word had one, two, or more morphemes, and what they were?

The first thing to do would be to ask native speakers how they say various words. (It would help to have a Zorxese-English interpreter along; otherwise, copious gesturing is in order.) Assume you are talented in miming and manage to collect the following forms:

| Adjective | Meaning |
|-----------|---------------------|
| ugly | ‘very unattractive’ |
| uglier | ‘more ugly’ |
| ugliest | ‘most ugly’ |
| pretty | ‘nice looking’ |
| prettier | ‘more nice looking’ |
| prettiest | ‘most nice looking’ |
| tall | ‘large in height’ |
| taller | ‘more tall’ |
| tallest | ‘most tall’ |

To determine what the morphemes are in such a list, the first thing a field linguist would do is to see whether some forms mean the same thing in different words, that is, to look for *recurring* forms. We find them: *ugly* occurs in *ugly*, *uglier*, and *ugliest*, all of which include the meaning ‘very unattractive.’ We also find that *-er* occurs in *prettier* and *taller*, adding the meaning ‘more’ to the adjectives to which it is attached. Similarly, *-est* adds the meaning ‘most.’ Furthermore by having our Zorxese-English interpreter pose additional questions to our native English-speaking consultant we find that *-er* and *-est* do not occur in isolation with the meanings of ‘more’ and ‘most.’ We can therefore conclude that the following morphemes occur in English:

| | |
|--------|------------------------------|
| ugly | root morpheme |
| pretty | root morpheme |
| tall | root morpheme |
| -er | bound morpheme ‘comparative’ |
| -est | bound morpheme ‘superlative’ |

As we proceed we find other words that end with *-er* (e.g., *singer*, *lover*, *bomber*, *writer*, *teacher*) in which the *-er* ending does not mean ‘comparative’ but, when attached to a verb, changes it to ‘a noun who “verbs,”’ (e.g., *sings*, *loves*, *bombs*, *writes*, *teaches*). So we conclude that this is a different morpheme, even though it is pronounced the same as the comparative. We go on and find words like *number*, *somber*, *butter*, *member*, and many others in which the *-er* has no separate meaning at all—a *somber* is not ‘one who sombs’ and a *member* does not *memb*—and therefore these words must be monomorphemic.

Case study 2

Once you have practiced on the morphology of English, you might want to go on to describe another language. Paku was invented by the linguist Victoria Fromkin for a 1970s TV series called *Land of the Lost*, made into a major motion picture of the same name starring Will Farrell in 2009. This was the language used by the monkey people called Pakuni. Suppose you found yourself in this strange land and attempted to find out what the morphemes of Paku were. Again, you would collect your data from a native Paku speaker and proceed as the Zorxian did with English. Consider the following data from Paku:

| | | | |
|-------|------------------|---------|----------------------|
| me | ‘I’ | meni | ‘we’ |
| ye | ‘you (singular)’ | yeni | ‘you (plural)’ |
| we | ‘he’ | weni | ‘they (masculine)’ |
| wa | ‘she’ | wani | ‘they (feminine)’ |
| abuma | ‘girl’ | abumani | ‘girls’ |
| adusa | ‘boy’ | adusani | ‘boys’ |
| abu | ‘child’ | abuni | ‘children’ |
| Paku | ‘one Paku’ | Pakuni | ‘more than one Paku’ |

By examining these words you find that the plural forms end in *-ni* and the singular forms do not. You therefore conclude that *-ni* is a separate morpheme meaning ‘plural’ that is attached as a suffix to a noun.

Case study 3

Here is a more challenging example, but the principles are the same. Look for repetitions and near repetitions of the same word parts, taking your cues from the meanings given. These are words from Michoacan Aztec, an indigenous language of Mexico:

| | | | |
|-----------|--------------|------------|------------------|
| nokali | 'my house' | mopelo | 'your dog' |
| nokalimes | 'my houses' | mopelomes | 'your dogs' |
| mokali | 'your house' | ikwahmili | 'his cornfield' |
| ikali | 'his house' | nokwahmili | 'my cornfield' |
| nopelo | 'my dog' | mokwahmili | 'your cornfield' |

We see there are three base meanings: *house*, *dog*, and *cornfield*. Starting with *house* we look for commonalities in all the forms that refer to 'house.' They all contain *kali* so that makes a good first guess. (We might, and you might, have reasonably guessed *kal*, but eventually we wouldn't know what to do with the *i* at the end of *nokali* and *mokali*.) With *kali* as 'house' we may infer that *no* is a prefix meaning 'my,' and that is supported by *nopelo* meaning 'my dog.' This being the case, we guess that *pelo* is 'dog,' and see where that leads us. If *pelo* is 'dog' and *mopelo* is 'your dog,' then *mo* is probably the prefix for 'your.' Now that we think that the possessive pronouns are prefixes, we can look at *ikali* and deduce that *i* means 'his.' If we're right about the prefixes then we can separate out the word for 'cornfield' as *kwahmili*, and at this point we're a-rockin' and a-rollin'. The only morpheme unaccounted for is 'plural.' We have two instances of plurality, *nokalimes* and *mopelomes*, but since we know *no*, *kali*, *mo*, and *pelo*, it is straightforward to identify the plural morpheme as the suffix *mes*.

The end results of our analysis are:

| | |
|----------|-------------|
| kali | 'house' |
| pelo | 'dog' |
| kwahmili | 'cornfield' |
| no- | 'my' |
| mo- | 'your' |
| i- | 'his' |
| -mes | 'plural' |

Case study 4

Here is a final example of morphological analysis complicated by some changes in spelling (pronunciation), a bit like the way we spell the indefinite article "a" as either *a* before a consonant or *an* before a vowel in English.

Often the data you are given (or record in the field) are a hodge-podge, like these examples from a Slavic language:

| | | | |
|-----------|------------------|-----------|------------------|
| gledati | 'to watch' | nazivaju | 'they call' |
| diram | 'I touch' | sviranje | 'playing (noun)' |
| nazivanje | 'calling (noun)' | gladujem | 'I starve' |
| dirati | 'to touch' | kupuju | 'they buy' |
| kupovanje | 'buying (noun)' | stanovati | 'to live' |
| sviraju | 'they play' | kupujem | 'I buy' |

| | | | |
|------------|-------------------|------------|-------------------|
| gledam | ‘I watch’ | diranje | ‘touching (noun)’ |
| stanovanje | ‘living (noun)’ | stanujem | ‘I live’ |
| diraju | ‘they touch’ | gladovanje | ‘starving (noun)’ |
| nazivati | ‘to call’ | stanuju | ‘they live’ |
| kupovati | ‘to buy’ | gledaju | ‘they watch’ |
| gladuju | ‘they starve’ | svirati | ‘to play’ |
| gladovati | ‘to starve’ | sviram | ‘I play’ |
| gledanje | ‘watching (noun)’ | nazivam | ‘I call’ |

The first step is often merely to rearrange the data, grouping commonalities. Here we see that after (possibly considerable) perusal, the data involve seven stems, which we group by meaning. We also note that there are exactly four forms for each stem (infinitive, I (1st person singular), they (3rd person plural) and the noun form or gerund) and we fold that into the reorganization. We even alphabetize to emphasize the orderliness. Thus rearranged the data appear less daunting:

| | touch | starve | watch | buy | call | live | play |
|-------------------------|---------|------------|----------|-----------|-----------|------------|----------|
| Infinitive | dirati | gladovati | gledati | kupovati | nazivati | stanovati | svirati |
| 1 st , Sing. | diram | gladujem | gledam | kupujem | nazivam | stanujem | sviram |
| 3 rd , Plur. | diraju | gladuju | gledaju | kupuju | nazivaju | stanuju | sviraju |
| Noun | diranje | gladovanje | gledanje | kupovanje | nazivanje | stanovanje | sviranje |

Now the patterns become more evident. We hypothesize that in the first column *dir-* is a stem meaning ‘touch’ and that the suffix *-ati* forms the infinitive; the suffix *-am* is the first-person singular; the suffix *-aju* is the third-person plural; and finally that the suffix *-anje* forms a noun, similar to the suffix *-ing* in English. We need to test our guess and the second column belies our hypothesis, but undaunted we push on and we see that the columns for ‘watch,’ ‘call,’ and ‘play’ work exactly like the column for ‘touch,’ with stems *gled-*, *naziv-*, and *svir-*.

But columns ‘starve,’ ‘buy,’ and ‘live’ are not cooperating. They follow the pattern for the infinitive (first row) and noun formation (fourth row), and give us stems *gladov-*, *kupov-*, and *stanov-* but something is awry in the second and third row for these three verbs. Instead of *-am* meaning ‘I’ it appears to be *-em*. (Yes, it could be *-ujem* or even *-jem*, but we stay with the form that’s nearest to *-am*.) So the suffix meaning ‘I’ has two forms, *am/em*, again analogous to the English *a/an* alternation.

But horrors, something is going haywire with the stems in just these three cases and now our effort to rearrange the data pays off. We see fairly quickly that the misbehaving cases are all verbs ending in *ov*. And if we stick with our decision that *-am/-em* means ‘I,’ then we can hypothesize that the stem alternates pronunciation in certain cases when it ends in *ov*, kind of like English *democrat/democracy*. If we accept this we are forced into the decision that the third-person plural morpheme also has an alternate form, namely *u*, so its two forms are *-aju/-u*.

We may sum up our analysis as follows:

Stems *dir-*, *gled-*, *naziv-*, *svir-* take suffixes *-ati*, *-am*, *-aju*, *-anje*. The verbs ending in *ov* have stems *gladov-*, *kupov-*, *stanov-* when expressed as infinitives with *-ati*, and noun-forms with *-anje*; and stems *gladuj-*, *kupuj-*, *stanuj-* when expressed as ‘I’ with *-em* or as ‘they’ with *-u*.

Finally, if we discover in our field work, for example, that *razarati* means ‘to destroy’ then we immediately know that ‘I destroy’ is *razaram*, ‘they destroy’ is *razaraju*, and ‘destruction’ is *razaranje*. Or if we’re told that *darujem* means ‘I gift’ then we deduce that the noun ‘gift’ is *darovanje*, the infinitive ‘to gift’ is *darovati*, and ‘they gift’ is *daruju*.

In chapter 6 we’ll see *why* the “same” morpheme may be spelled or pronounced differently in different contexts, and that the variation, like most grammatical processes, is rule-governed. By following the analytical principles discussed in the preceding four case studies you should be able to solve the morphological puzzles that appear in the exercises.

Summary

Knowing a language means knowing the **morphemes** of that language, which are the elemental units that constitute words. *Moralizers* is an English word composed of four morphemes: *moral* + *ize* + *er* + *s*. When you know a word or morpheme, you know both its **form** (sound or gesture) and its **meaning**; these are inseparable parts of the **linguistic sign**. The relationship between form and meaning is **arbitrary**. There is no inherent connection between them (i.e., the words and morphemes of any language must be learned).

Morphemes may be free or bound. **Free morphemes** stand alone like *girl* or *the*, and they come in two types: **open class**, containing the content words of the language, and **closed class**, containing function words such as *the* or *of*. **Bound morphemes** may be **affixes** or bound roots such as *-ceive*. Affixes may be **prefixes**, **suffixes**, **circumfixes**, or **infixes**. Affixes may be derivational or inflectional. **Derivational affixes** derive new words; **inflectional affixes**, such as the plural affix *-s*, make grammatical changes to words. Complex words contain a **root** around which **stems** are built by affixation. Rules of morphology determine what kind of affixation produces actual words such as *un* + *system* + *atic*, and what kind produces nonwords such as **un* + *system*.

Words have hierarchical structure evidenced by ambiguous words such as *unlockable*, which may be *un* + *lockable* ‘unable to be locked’ or *unlock* + *able* ‘able to be unlocked.’

Some morphological rules are **productive**, meaning they apply freely to the appropriate stem; for example, *re-* applies freely to verbal stems to give words like *redo*, *rewash*, and *repaint*. Other rules are more constrained, forming words like *young* + *ster* but not **smart* + *ster*. Inflectional morphology is extremely productive: the plural *-s* applies freely even to nonsense words. **Suppletive forms** escape inflectional morphology, so instead of **mans* we have *men*; instead of **bringed* we have *brought*.

There are many ways for new words to be created other than affixation. **Compounds** are formed by uniting two or more root words in a single word, such as *homework*. The **head** of the compound (the rightmost word) bears the basic meaning, so *homework* means a kind of work done at home, but often the meaning of compounds is not easily predictable and must be learned as individual lexical items, such as *laughing gas*. **Back-formations** are words created by misinterpreting an affix look-alike such as *-er* as an actual affix, so, for example, the verb *peddle* was formed under the mistaken assumption that peddler was *peddle* + *-er*.

The grammars of sign languages also include a morphological component consisting of a root, derivational and inflectional sign morphemes, and the rules for their combination.

Morphological analysis is the process of identifying form-meaning units in a language, taking into account small differences in pronunciation, so that prefixes *in-* and *im-* are seen to be variants of the “same” prefix in English (cf. *intolerable*, *impeccable*) just as *democrat* and *democrac* are stem variants of the same morpheme, which shows up in *democratic* with its “t” and in *democracy* with its “c.”

References for Further Reading

- Anderson, S. R. 1992. *A-morphous morphology*. Cambridge, UK: Cambridge University Press.
- Aronoff, M. 1976. *Word formation in generative grammar*. Cambridge, MA: MIT Press.
- _____, and Fudeman, K. 2005. *What is morphology?* Malden: MA: Blackwell Publishing.
- Bauer, L. 2003. *Introducing linguistic morphology, 2nd ed.* Washington, DC: Georgetown University Press.
- Haspelmath, M. and Sims, A. 2010. *Understanding morphology, 2nd ed.* USA: Oxford University Press.
- Jensen, J. T. 1990. *Morphology: Word structure in generative grammar*. Amsterdam/Philadelphia: John Benjamins Publishing.
- Katamba, F. 2004. *Morphology: its relation to semantics and the lexicon*. Oxford, UK: Taylor and Francis.
- Matthews, P. H. 1991. *Morphology: An introduction to the theory of word structure, 2nd ed.* Cambridge, UK: Cambridge University Press.
- Pinker, S. 2000. *Words and rules: the ingredients of language*. New York: Harper Collins.
- Stockwell, R., and D. Minkova. 2001. *English words: History and structure*. New York: Cambridge University Press.
- Winchester, S. 2003. *The meaning of everything (The story of the Oxford English Dictionary)*. Oxford, UK: Oxford University Press.
- _____. 1999. *The professor and the madman*. New York: HarperCollins.

Exercises

1. Here is how to estimate the number of words in your mental lexicon. Consult any standard dictionary. (Note that Internet dictionaries may not work for this exercise.)
 - a. Count the number of entries on a typical page. They are usually boldfaced.
 - b. Multiply the number of words per page by the number of pages in the dictionary.
 - c. Pick four pages in the dictionary at random, say, pages 50, 75, 125, and 303. Count the number of words on these pages.
 - d. How many of these words do you know?
 - e. What percentage of the words on the four pages do you know?
 - f. Multiply the words in the dictionary by the percentage you arrived at in (e). You know approximately that many English words.
2. Divide the following words by placing a + between their morphemes. (Some of the words may be monomorphemic and therefore indivisible.)

Example: replaces = re + place + s

- | | |
|-----------------|--------------------|
| a. retroactive | n. airsickness |
| b. befriended | o. bureaucrat |
| c. televise | p. democrat |
| d. margin | q. aristocrat |
| e. endearment | r. plutocrat |
| f. psychology | s. democracy |
| g. unpalatable | t. democratic |
| h. holiday | u. democratically |
| i. grandmother | v. democratization |
| j. morphemic | w. democratize |
| k. mistreatment | x. democratizer |
| l. deactivation | y. democratizing |
| m. saltpeter | z. democratized |

3. Match each expression under A with the one statement under B that characterizes it.

- | | |
|---------------|---|
| A | B |
| a. noisy crow | (1) compound noun |
| b. scarecrow | (2) root morpheme plus derivational prefix |
| c. the crow | (3) phrase consisting of adjective plus noun |
| d. crowlike | (4) root morpheme plus inflectional affix |
| e. crows | (5) root morpheme plus derivational suffix |
| | (6) grammatical morpheme followed by lexical morpheme |

4. Write the one proper description from the list under B for the italicized part of each word in A.

- | | |
|----------------|-------------------------|
| A | B |
| a. terrorized | (1) free root |
| b. uncivilized | (2) bound root |
| c. terrorize | (3) inflectional suffix |
| d. lukewarm | (4) derivational suffix |
| e. impossible | (5) inflectional prefix |
| | (6) derivational prefix |
| | (7) inflectional infix |
| | (8) derivational infix |

5. Part One:

Consider the following nouns in Zulu and proceed to look for the recurring forms.

- | | | | |
|-----------|-----------------|------------|-----------------|
| umfazi | ‘married woman’ | abafazi | ‘married women’ |
| umfani | ‘boy’ | abafani | ‘boys’ |
| umzali | ‘parent’ | abazali | ‘parents’ |
| umfundisi | ‘teacher’ | abafundisi | ‘teachers’ |
| umbazi | ‘carver’ | ababazi | ‘carvers’ |
| umlimi | ‘farmer’ | abalimi | ‘farmers’ |
| umdlali | ‘player’ | abadlali | ‘players’ |
| umfundi | ‘reader’ | abafundi | ‘readers’ |

- a. What is the morpheme meaning ‘singular’ in Zulu?
- b. What is the morpheme meaning ‘plural’ in Zulu?
- c. List the Zulu stems to which the singular and plural morphemes are attached, and give their meanings.

Part Two:

The following Zulu verbs are derived from noun stems by adding a verbal suffix.

| | | | |
|---------|----------------|-------|------------|
| fundisa | ‘to teach’ | funda | ‘to read’ |
| lima | ‘to cultivate’ | baza | ‘to carve’ |

- d. Compare these words to the words in section A that are related in meaning, for example, *umfundisi* ‘teacher,’ *abafundisi* ‘teachers,’ *fundisa* ‘to teach.’ What is the derivational suffix that specifies the category verb?
 - e. What is the nominal suffix (i.e., the suffix that forms nouns)?
 - f. State the morphological noun formation rule in Zulu.
 - g. What is the stem morpheme meaning ‘read’?
 - h. What is the stem morpheme meaning ‘carve’?
6. Sweden has given the world the rock group ABBA, the automobile Volvo, and the great film director Ingmar Bergman. The Swedish language offers us a noun morphology that you can analyze with the knowledge gained reading this chapter. Consider these Swedish noun forms:

| | | | |
|----------|---------------|-----------|---------------|
| en lampa | ‘a lamp’ | en bil | ‘a car’ |
| en stol | ‘a chair’ | en soffa | ‘a sofa’ |
| en matta | ‘a carpet’ | en tratt | ‘a funnel’ |
| lampor | ‘lamps’ | bilar | ‘cars’ |
| stolar | ‘chairs’ | soffor | ‘sofas’ |
| mattor | ‘carpets’ | trattar | ‘funnels’ |
| lampan | ‘the lamp’ | bilen | ‘the car’ |
| stolen | ‘the chair’ | soffan | ‘the sofa’ |
| mattan | ‘the carpet’ | tratten | ‘the funnel’ |
| lamporna | ‘the lamps’ | bilarna | ‘the cars’ |
| stolarna | ‘the chairs’ | sofforna | ‘the sofas’ |
| mattorna | ‘the carpets’ | trattarna | ‘the funnels’ |

- a. What is the Swedish word for the indefinite article *a* (or *an*)?
- b. What are the two forms of the plural morpheme in these data? How can you tell which plural form applies?
- c. What are the two forms of the morpheme that make a singular word definite, that is, correspond to the English article *the*? How can you tell which form applies?
- d. What is the morpheme that makes a plural word definite?
- e. In what order do the various suffixes occur when there is more than one?
- f. If *en flicka* is ‘a girl,’ what are the forms for ‘girls,’ ‘the girl,’ and ‘the girls’?
- g. If *bussarna* is ‘the buses,’ what are the forms for ‘buses’ and ‘the bus’?

7. Here are some nouns from the Philippine language Cebuano.

| | |
|-----------|------------------------|
| sibwano | 'a Cebuano' |
| ilokano | 'an Ilocano' |
| tagalog | 'a Tagalog person' |
| inglis | 'an Englishman' |
| bisaja | 'a Visayan' |
| binisaja | 'the Visayan language' |
| ininglis | 'the English language' |
| tinagalog | 'the Tagalog language' |
| inilokano | 'the Ilocano language' |
| sibiwano | 'the Cebuano language' |

- What is the exact rule for deriving language names from ethnic group names?
- What type of affixation is represented here?
- If *suwid* meant 'a Swede' and *italo* meant 'an Italian,' what would be the words for the Swedish language and the Italian language?
- If *finuranso* meant 'the French language' and *inunagari* meant 'the Hungarian language,' what would be the words for a Frenchman and a Hungarian?

8. The following infinitive and past participle verb forms are found in Dutch.

| Root | Infinitive | Past Participle | |
|----------|------------|-----------------|----------------|
| wandel | wandelen | gewandeld | 'walk' |
| duw | duwen | geduwd | 'push' |
| stofzuig | stofzuigen | gestofzuigd | 'vacuum-clean' |

With reference to the morphological processes of prefixing, suffixing, infixing, and circumfixing discussed in this chapter and the specific morphemes involved:

- State the morphological rule for forming an infinitive in Dutch.
- State the morphological rule for forming the Dutch past participle form.

9. Below are some sentences in Swahili:

| | | |
|--------|------------|------------------------------|
| mtoto | amefika | 'The child has arrived.' |
| mtoto | anafika | 'The child is arriving.' |
| mtoto | atafika | 'The child will arrive.' |
| watoto | wamefika | 'The children have arrived.' |
| watoto | wanafika | 'The children are arriving.' |
| watoto | watafika | 'The children will arrive.' |
| mtu | amelala | 'The person has slept.' |
| mtu | analala | 'The person is sleeping.' |
| mtu | atalala | 'The person will sleep.' |
| watu | wamelala | 'The persons have slept.' |
| watu | wanalala | 'The persons are sleeping.' |
| watu | watalala | 'The persons will sleep.' |
| kisu | kimeanguka | 'The knife has fallen.' |
| kisu | kinaanguka | 'The knife is falling.' |
| kisu | kitaanguka | 'The knife will fall.' |

| | | |
|--------|------------|----------------------------|
| visu | vimeanguka | ‘The knives have fallen.’ |
| visu | vinaanguka | ‘The knives are falling.’ |
| visu | vitaanguka | ‘The knives will fall.’ |
| kikapu | kimeanguka | ‘The basket has fallen.’ |
| kikapu | kinaanguka | ‘The basket is falling.’ |
| kikapu | kitaanguka | ‘The basket will fall.’ |
| vikapu | vimeanguka | ‘The baskets have fallen.’ |
| vikapu | vinaanguka | ‘The baskets are falling.’ |
| vikapu | vitaanguka | ‘The baskets will fall.’ |

One of the characteristic features of Swahili (and Bantu languages in general) is the existence of noun classes. Specific singular and plural prefixes occur with the nouns in each class. These prefixes are also used for purposes of agreement between the subject noun and the verb. In the sentences given, two of these classes are included (there are many more in the language).

a. Identify all the morphemes you can detect, and give their meanings.

Example: -toto ‘child’
m- prefix attached to singular nouns of Class I
a- prefix attached to verbs when the subject is a singular noun of Class I

Be sure to look for the other noun and verb markers, including tense markers.

b. How is the verb constructed? That is, what kinds of morphemes are strung together and in what order?

c. How would you say in Swahili:

- (1) “The child is falling.”
- (2) “The baskets have arrived.”
- (3) “The person will fall.”

10. Part One

We mentioned the morphological process of reduplication—the formation of new words through the repetition of part or all of a word—which occurs in many languages. The following examples from Samoan illustrate this kind of morphological rule.

| | | | |
|---------|----------------|-----------|-------------------|
| manao | ‘he wishes’ | mananao | ‘they wish’ |
| matua | ‘he is old’ | matutua | ‘they are old’ |
| malosi | ‘he is strong’ | malolosi | ‘they are strong’ |
| punou | ‘he bends’ | punonou | ‘they bend’ |
| atamaki | ‘he is wise’ | atamamaki | ‘they are wise’ |
| savali | ‘he travels’ | pepese | ‘they sing’ |
| laga | ‘he weaves’ | | |

a. What is the Samoan for:

- (1) ‘they weave’
- (2) ‘they travel’
- (3) ‘he sings’

- b. Formulate a general statement (a morphological rule) that states how to form the plural verb form from the singular verb form.

Part Two

Consider these data from M'ngong (spoken in Vietnam) with some simplifications for this exercise: (The ? is a sound called a glottal stop.)

| | | | |
|-------|---------|------------|------------------|
| dang | 'hard' | da dang | 'a little hard' |
| kloh | 'clean' | klo kloh | 'a little clean' |
| ndreh | 'green' | ndre ndreh | 'light green' |
| guh | 'red' | go? guh | 'reddish' |
| duh | 'hot' | do? duh | 'luke warm' |
| kat | 'cold' | ka kat | 'chilly' |

1. What kind of morphological process do you observe to achieve the semantic effect of weakening an adjective?
 2. If *thong* meant 'light,' how would M'ngong express 'kind of light'?
 3. If *khul* meant 'evasive,' how would M'ngong express 'a little shifty'?
 4. If *lo?* *luq* meant 'a little paunchy,' how would M'ngong express 'fat'?
 5. If *kho* *khot* meant 'a little crazy,' how would M'ngong express 'crazy'?
 6. Formulate a general statement (a morphological rule) of how M'ngong speakers weaken certain kinds of adjectives. To be completely accurate and account for the given data, you will have to take spelling (pronunciation) into account.
11. Following are listed some words followed by incorrect (humorous?) definitions:

| Word | Definition |
|------------------|--|
| stalemate | 'husband or wife no longer interested' |
| effusive | 'able to be merged' |
| tenet | 'a group of ten singers' |
| dermatology | 'a study of derms' |
| ingenious | 'not very smart' |
| finesse | 'a female fish' |
| amphibious | 'able to lie on both sea and land' |
| deceptionist | 'secretary who covers up for his boss' |
| mathemagician | 'Bernie Madoff's accountant' |
| sixeddrin | 'medicine for mate who says, "sorry, I have a headache"' |
| testostoroni | 'hormonal supplement administered as pasta' |
| aesthetominophen | 'medicine to make you look beautiful' |
| histaavista | 'say goodbye to those allergies' |
| aquapella | 'singing in the shower' |
| melancholy | 'dog that guards the cantaloupe patch' |
| plutocrat | 'a dog that rules' |

Give some possible reasons for the source of these silly “definitions.” Illustrate your answers by reference to other words or morphemes. For example, *stalemate* comes from *stale* meaning ‘having lost freshness’ and *mate* meaning ‘marriage partner.’ When mates appear to have lost their freshness, they are no longer as desirable as they once were.

12. a. Draw tree diagrams for the following words: *construal*, *disappearances*, *irreplaceability*, *misconceive*, *indecipherable*, *redarken*.
 b. Draw two tree diagrams for *undarkenable* to reveal its two meanings: ‘able to be less dark’ and ‘unable to be made dark.’
13. There are many asymmetries in English in which a root morpheme combined with a prefix constitutes a word, but without the prefix is a nonword. A number of these are given in this chapter.
 - a. Following is a list of such nonword roots. Add a prefix to each root to form an existing English word.

| Words | Nonwords |
|-------|------------|
| _____ | *descript |
| _____ | *cognito |
| _____ | *beknownst |
| _____ | *peccable |
| _____ | *promptu |
| _____ | *plussed |
| _____ | *domitable |
| _____ | *nomer |
| _____ | *crat |

- b. There are many more such multimorphemic words for which the root morphemes do not constitute words by themselves. Can you list five more?
14. We have seen that the meaning of compounds is often not revealed by the meanings of their composite words. Crossword puzzles and riddles often make use of this by providing the meaning of two parts of a compound and asking for the resulting word. For example, *infielder* = diminutive/cease. Read this as asking for a word that means ‘infielder’ by combining a word that means ‘diminutive’ with a word that means ‘cease.’ The answer is *shortstop*. See if you can figure out the following:
 - a. sci-fi TV series = headliner/journey
 - b. campaign = farm building/tempest
 - c. at-home wear = tub of water/court attire
 - d. kind of pen = formal dance/sharp end
 - e. conservative = correct/part of an airplane
15. Consider the following dialogue between parent and schoolchild:

PARENT: When will you be done with your eight-page book report, dear?
 CHILD: I haven’t started it yet.

- PARENT: But it's due tomorrow, you should have begun weeks ago. Why do you always wait until the last minute?
- CHILD: I have more confidence in myself than you do.
- PARENT: Say what?
- CHILD: I mean, how long could it possibly take to read an eight-page book?

The humor is based on the ambiguity of the compound *eight-page book report*. Draw two trees similar to those in the text for *top hat rack* to reveal the ambiguity.

16. One of the characteristics of Italian is that articles and adjectives have inflectional endings that mark agreement in gender (and number) with the nouns they modify. Based on this information, answer the questions that follow the list of Italian phrases.

| | |
|----------------------|---------------------|
| un uomo | 'a man' |
| un uomo robusto | 'a robust man' |
| un uomo robustissimo | 'a very robust man' |
| una donna robusta | 'a robust woman' |
| un vino rosso | 'a red wine' |
| una faccia | 'a face' |
| un vento secco | 'a dry wind' |

- a. What is the root morpheme meaning 'robust'?
- b. What is the morpheme meaning 'very'?
- c. What is the Italian for:
- (1) 'a robust wine'
 - (2) 'a very red face'
 - (3) 'a very dry wine'
17. Following is a list of words from Turkish. In Turkish, articles and morphemes indicating location are affixed to the noun.
- | | | | |
|---------|---------------|-----------|-----------------|
| deniz | 'an ocean' | evden | 'from a house' |
| denize | 'to an ocean' | evimden | 'from my house' |
| denizin | 'of an ocean' | denizimde | 'in my ocean' |
| eve | 'to a house' | elde | 'in a hand' |
- a. What is the Turkish morpheme meaning 'to'?
- b. What kind of affixes in Turkish correspond to English prepositions (e.g., prefixes, suffixes, infixes, free morphemes)?
- c. What would the Turkish word for 'from an ocean' be?
- d. How many morphemes are there in the Turkish word *denizimde*?
18. The following are some verb forms in Chickasaw, a member of the Muskogean family of languages spoken in south-central Oklahoma.⁵ Chickasaw is an endangered language (see chapter 8). Currently, there are only about 100 speakers of Chickasaw, most of whom are over 70 years old.

⁵The Chickasaw examples are provided by Pamela Munro.

| | |
|---------------|--------------------|
| sachaaha | 'I am tall' |
| chaaha | 'he/she is tall' |
| chichaaha | 'you are tall' |
| hoochaaha | 'they are tall' |
| satikahbi | 'I am tired' |
| chitikahbitok | 'you were tired' |
| chichchokwa | 'you are cold' |
| hopobatok | 'he was hungry' |
| hoohopobatok | 'they were hungry' |
| sahopoba | 'I am hungry' |

- a. What is the root morpheme for the following verbs?
 - (1) 'to be tall' (2) 'to be hungry'
- b. What is the morpheme meaning:
 - (1) past tense
 - (2) 'I'
 - (3) 'you'
 - (4) 'he/she'
- c. If the Chickasaw root for 'to be old' is *sipokni*, how would you say:
 - (1) 'You are old'
 - (2) 'He was old'
 - (3) 'They are old'

19. The language Little-End Egglish, whose source is revealed in exercise 14, chapter 8, exhibits the following data:

| | | | | | |
|-----|-----------------|---------|----------------|---------|------------------|
| kul | 'omelet' | zkulego | 'my omelet' | zkulivo | 'your omelet' |
| vet | 'yolk (of egg)' | zvetego | 'my yolk' | zvetivo | 'your yolk' |
| rok | 'egg' | zrokego | 'my egg' | zrokivo | 'your egg' |
| ver | 'egg shell' | zverego | 'my egg shell' | zverivo | 'your egg shell' |
| gup | 'soufflé' | zgupego | 'my soufflé' | zgupivo | 'your soufflé' |

- a. Isolate the morphemes that indicate possession, first-person singular, and second person (we don't know whether singular, plural, or both). Indicate whether the affixes are prefixes or suffixes.
 - b. Given that *vel* means egg white, how would a Little-End Egglisher say 'my egg white'?
 - c. Given that *zpeivo* means 'your hard-boiled egg,' what is the word meaning 'hard-boiled egg'?
 - d. If you knew that *zvetgogo* meant 'our egg yolk,' what would be likely to be the morpheme meaning 'our'?
 - e. If you knew that *borokego* meant 'for my egg,' what would be likely to be the morpheme bearing the benefactive meaning 'for'?
20. Here are some data from the indigenous language Zoque spoken in Mexico. (The ? is a glottal stop.) Hint: Rearrange the data as in the Slavic example at the end of the chapter.

| | | | |
|-------|-----------------|-------|----------------|
| sohsu | 'he/it cooked' | cicpa | 'he/it tears |
| witpa | 'he/it walks' | kenu | 'he/it looked' |
| sikpa | 'he/it laughs' | cihcu | 'he/it tore' |
| ka?u | 'he/it died' | sospa | 'he/it cooks' |
| kenpa | 'he/it looks' | wihtu | 'he/it walked' |
| sihku | 'he/it laughed' | ka?pa | 'he/it dies' |

- a. What is the past tense suffix?
 - b. What is the present tense suffix?
 - c. This language has some verb stems that assume two forms. For each verb (or stem pair), give its meaning and form(s).
 - d. What morphological environment determines which of the two forms occurs, when there are two?
21. **Research project:** Consider what are called “interfixes” such as *-o-* in English *jack-o-lantern*. They are said to be meaningless morphemes attached to two morphemes at once. What can you learn about that notion? Where do you think the *-o-* comes from? Are there languages other than English that have interfixes?