

3 CHAPTER

Morphology: The Words of Language

A word is dead
When it is said,
Some say.
I say it just
Begins to live
That day.

Emily Dickinson, "A Word"



Every speaker of every language knows tens of thousands of words. *Webster's Third International Dictionary of the English Language* has over 450,000 entries. Most speakers don't know all 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 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 be understood 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.

What is a word? What do you know when you know a word? Suppose you hear someone say *morpheme* and haven't the slightest idea what it means, and you don't know what the "smallest unit of linguistic meaning" is called. Then you don't know the word *morpheme*. A particular string of sounds must be united with a meaning, and a meaning must be united with specific sounds in order for the sounds or the meaning to

be a word in our mental dictionaries. Once you learn both the sounds and their related meaning, you know the word. It becomes an entry in your mental **lexicon** (the Greek word for *dictionary*), part of your linguistic knowledge.

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. A speaker of English has no difficulty in segmenting the stream of sounds into six individual words: *the, cat, sat, on, the, and mat*. Similarly, a speaker of the American Indian language Potawatomi knows that *kwapmuknanuk* (which means "they see us") is just one word.

The lack of pauses between words in speech has provided humorists and songwriters with much material. During World War II, the chorus of one of the Top Ten tunes sung by Bing Crosby and Bob Hope used this fact about speech to amuse us:

Mairzy doats and dozy doats	(Mares eat oats and does eat oats,
And liddle lamzy divey,	And little lambs eat ivy,
A kiddley-divey too,	A kid'll eat ivy too,
Wouldn't you?	Wouldn't you?)

Similarly, the comical hosts of the show *CarTalk*, aired on National Public Radio, 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, Cheethum, and Howe	(Do we cheat them and how)

The fact that the same sounds can be interpreted differently, even between languages, gave birth to an entertaining book. The title, *Mots D'Heures: Gousses, Rames*,¹ was derived from the fact that *Mother Goose Rhymes*, spoken in English, sounds to a French speaker like the French words meaning "Words of the Hours: Root and Branch." The first rhyme in French starts:

Un petit d'un petit
S'étonne aux Halles.

When interpreted as if it were English it would sound like:

Humpty Dumpty
Sat on a wall.

¹ Luis d'Antin Van Routen, ed. and annotator. 1993. *Mots d'Heures: Gousses Rames. The d'Antin Manuscript*. London: Grafton.

This shows that in a particular language, the form (sounds or pronunciation) and the meaning of a word are like two sides of a coin. *Un petit d'un petit* in French means “a little one of a little one” but in English the sounds represent the name *Humpty Dumpty*.

Similarly, in English, the sounds of the letters *bear* and *bare* represent four **homonyms** (also called **homophones**), different words with the same sounds, as shown in the sentences:

She can't bear (tolerate) children.

She can't bear (give birth to) children.

Bruin bear is the mascot of UCLA.

He stood there — bare and beautiful.

Couch and *sofa*, though they have the same meaning, are two words because they are represented by two different strings of sounds.

Sometimes we think we know a word even though we don't know what it means. In an introductory linguistics class, most of the 400 students had heard the word *antidisestablishmentarianism* and believed it to be the longest word in the English language. Yet, many of these students were unsure of its meaning. According to how we have defined what it means to “know a word”—pairing a string of sounds with a particular meaning—such individuals do not really know this word.

Information about the longest or shortest word in the language is not part of linguistic knowledge of a language, but general conceptual knowledge *about* a language. Children do not learn such facts the way they learn the sound/meaning correspondences of the words of their language. Both children and adults have to be told that *antidisestablishmentarianism* is the longest word in English or discover it through an analysis of entries in a dictionary. Actually, should they wish to research the question, they would find that the longest word in *Webster's Seventh International Dictionary* is *pneumonoultramicroscopicsilicovolcanoconiosis*, a disease of the lungs. As we shall see in chapter 8, children don't have to conduct such research. They learn words like *elephant*, *disappear*, *mother*, and all the other words they know without being taught them explicitly or looking them up in a dictionary.

Since 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 its 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, its **grammatical category**, or **syntactic class**, is specified. You may not consciously know that a form like *love* is listed as both a verb and a noun, but a speaker has 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. The classes of words, the syntactic categories—such as nouns, verbs, adjectives, and so on—and the semantic properties of words, which represent their meanings, will be discussed in later chapters.

Dictionaries

Dictionary, n. A malevolent literary device for cramping the growth of a language and making it hard and inelastic.

Ambrose Bierce, *The Devil's Dictionary*

The dictionaries that one buys in a bookstore contain some of the information found in our mental dictionaries. The first dictionary to be printed in England was the Latin-English *Promptuorium parvulorum* in 1499; another Latin-English dictionary by Sir Thomas Elyot was published in 1538. Noah Webster, who lived from 1758 until 1843, published *An American Dictionary of the English Language* in two volumes in 1828. It contained about seventy thousand entries.



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One of the best efforts at lexicography (defined as "the editing or making of a dictionary" in *Webster's Third New Dictionary of the English Language: Unabridged*) was the *Dictionary of the English Language* by Dr. Samuel Johnson, published in 1755 in two volumes.

The aim of most early lexicographers, whom Dr. Johnson called "harmless drudges," was to *prescribe* rather than *describe* the words of a language. They strove to be, as stated in Webster's dictionaries, the "supreme authority" of the "correct" pronunciation and meaning of a word. To Johnson's credit, he stated in his preface that he could not construct the language but could only "register" it.

All dictionaries, from *The Oxford English Dictionary* (often referred to as the *OED* and called the greatest lexicographic work ever produced), to the more commonly used collegiate dictionaries, provide the following information about each word: (1) spelling, (2) the "standard" pronunciation, (3) definitions to represent the word's one or more meanings, and (4) parts of speech (e.g., noun, verb, preposition, etc.). Other information may include the etymology or history of the word, whether the word is nonstandard (such as *ain't*) or slang, vulgar, or obsolete. Many dictionaries provide quotations from published literature to illustrate the given definitions, as was first done by Johnson.

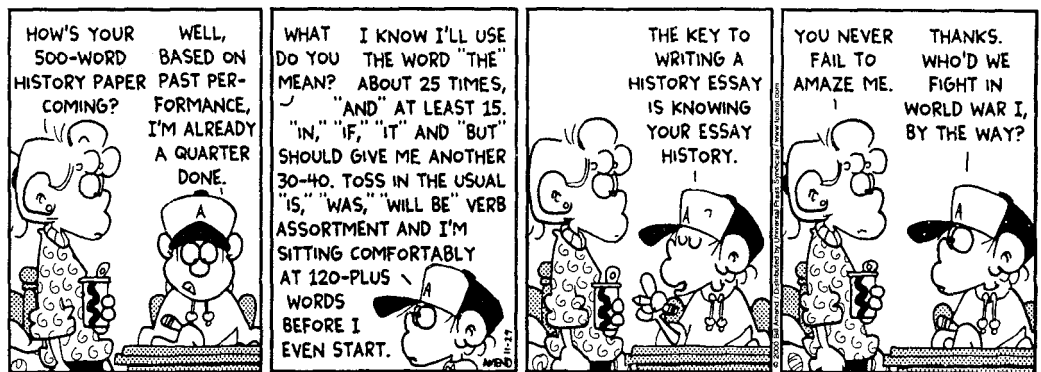
In recent years, perhaps due to the increasing specialization in science and the arts, or the growing fragmentation of the populace, we see the proliferation of hundreds of specialty and subspecialty dictionaries. A reference librarian at UCLA's Engineering

and Mathematical Sciences Library estimates that her library has more than six hundred such books.

Dictionaries of slang and jargon (see chapter 10) have existed for many years; so have multilingual dictionaries. In addition to these, the shelves of bookstores and libraries are now filled with dictionaries written specifically for biologists, engineers, agriculturists, economists, artists, architects, printers, gays and lesbians, transvestites, athletes, tennis players, and almost any group that has its own set of words to describe what they think and what they do. Our own mental dictionaries probably include only a small set of the entries in all of these dictionaries, but each word is in someone's lexicon.

Content Words and Function Words

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*, *anarchism*, *soar*, and *purple*. Content words are sometimes called the **open class** words because we can and regularly do add new words to these classes. A new word, *steganography*, which is the art of hiding information in electronic text, entered English with the Internet revolution. Verbs like *disrespect* and *download* entered the language quite recently, as have nouns like *byte* and *email*.



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Different languages may express the same concept using words of different grammatical classes. For example, in Akan, the major language of Ghana, there are only a handful of adjectives. Most concepts that would be expressed with adjectives in English are expressed by verbs in Akan. Instead of saying "The sun is bright today," an Akan speaker will say "The sun brightens today."

There are other classes of words that do not have clear lexical meaning or obvious concepts associated with them, including conjunctions such as *and*, *or*, and *but*; prepositions such as *in* and *of*; the articles *the*, *a/an*, and pronouns such as *it* and *he*. These

kinds of words are called **function words** because they have a grammatical function. 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.

Function words are sometimes called **closed class** words. It is difficult to think of new 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 neutral singular pronoun that would be neither masculine nor feminine and that could be used as the general, or **generic**, form. If such a pronoun existed, it might have prevented the department chairperson in a large university from making the incongruous statement: “We will hire the best person for the job regardless of his sex.” The UCLA psychologist Donald MacKay has suggested that we use “e,” pronounced like the letter name, for this pronoun with various alternative forms. Others point out that *they* and *their* are already being used as neutral third-person singular forms, as in “Anyone can do it if they try hard enough” or “Everyone can do their best.” The use of the various forms of *they* is standard on the BBC (British Broadcasting System) as pronoun replacements for *anyone* and *everyone*, which may be regarded as singular or plural.

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

Please count the number of F’s in the following text:

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

If you are like most people, your answer will be 3. That answer is wrong. The correct answer is 6. Count again. This time pay attention to the function word OF.

What this little test illustrates is that the brain treats content and function words differently. Indeed, there is a great deal of psychological and neurological evidence to support this claim. For example, the effect that we just illustrated with the OF test is much more pronounced in brain-damaged people. As discussed in chapter 2, some brain-damaged patients have greater difficulty in using, understanding, or reading function words than they do with content words. Some are unable to read function words like *in* or *which* but can read the lexical content words *inn* and *witch*. Other patients do just the opposite. 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 8). In the early stages of development, children often omit function words from their speech, for example, “doggie barking.” These two classes of words have different functions in language. Content words have semantic content (meaning). Function words play a grammatical role; they connect the content words to the larger grammatical context in ways that will be discussed in chapter 4.

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*

In the dialogue above, 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

Webster's Third New International Dictionary lists about 2700 adjectives beginning 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 words above, 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, which is rule-governed. *Uneaten*, *unadmired*, and *ungrammatical* are words in English, but **eatenun*, **admiredun*, and **grammaticalun* (to mean "not eaten," "not admired," "not grammatical") are not, because we do not form a negative meaning of a word by suffixing *un* but by prefixing it.

When Samuel Goldwyn, the pioneer moviemaker, announced: "In two words: impossible," he was reflecting the common view that words are the basic meaningful elements of a language. We have seen that this cannot be so, since 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." Linguistically speaking, then, Goldwyn should have said: "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 "science of" or "branch of knowledge concerning." Thus, the meaning of *morphology* is "the science of word forms."

Part of knowing a language is knowing its morphology. Like most linguistic knowledge, this is generally unconscious knowledge.

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

one morpheme	boy desire
two morphemes	boy + ish desire + able
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 ²

A morpheme may be represented by a single sound, such as the morpheme *a* meaning "without" as in *amoral* or *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*; or by three syllables, as in *Hackensack* or *crocodile*; or by four or more syllables, as in *hallucinate*.

A morpheme — the minimal linguistic unit — is thus an arbitrary union of a sound and a meaning that cannot be further analyzed. This may be too simple a definition, but it will serve our purposes for now. Every word in every language is composed of one or more morphemes.

The decomposition of words into morphemes illustrates one of the fundamental properties of human language — **discreteness**. In all languages, discrete linguistic units combine in rule-governed ways to form larger units. Sound units combine to form morphemes, morphemes combine to form words, and words combine to form larger units — phrases and sentences.

Discreteness is one of the properties that distinguish human languages from the communication systems of other species. Our knowledge of these discrete units and the rules for combining them accounts for the creativity of human language. Linguistic creativity refers to a person's ability to produce and understand an infinite range of sentences and words never before heard.

² Some speakers have even more morphemes in this word than are shown.

With respect to words, linguistic creativity means that not only can we understand words that we have never heard before, but we can also create new words. In the first case, we can decompose a word into its component parts and if we know the meaning of those parts, we have a good guess at the meaning of the whole. In the second case, 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 disk or a CD means to put information on it, you automatically understand that a *writable* CD is one that can take information; a *rewritable* CD is one where the original information can be written over; and an *unrewritable* CD 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 individual morphemes *write*, *re-*, *-able*, and *un-* and the rules for their combination.

Bound and Free Morphemes

PREFIXES AND SUFFIXES

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 host morpheme.



"LOOKS LIKE WE SPEND MOST OF OUR TIME INGING...
YOU KNOW, LIKE SLEEPING, EATING, RUNNING, CLIMBING..."

"Dennis the Menace" © copyright © 1987 by North America
Syndicate. Used by permission of Hank Ketchum.

Some morphemes like *boy*, *desire*, *gentle*, and *man* may constitute words by themselves. These are **free morphemes**. Other morphemes like *-ish*, *-ness*, *-ly*, *dis-*, *trans-*,

and *un-* are never words by themselves but are always parts of words. These affixes are **bound morphemes**. We know whether each affix precedes or follows other morphemes. Thus, *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* (e.g., *sleeping*, *eating*, *running*, *climbing*), *-er* (e.g., *singer*, *performer*, *reader*, and *beautifier*), *-ist* (e.g., *typist*, *copyist*, *pianist*, *novelist*, *collaborationist*, and *linguist*), and *-ly* (e.g., *manly*, *sickly*, *spectacularly*, and *friendly*), to mention only a few.

Morphemes are the minimal linguistic signs in all languages and many languages have prefixes and suffixes. But languages may differ in how they deploy their morphemes. A morpheme that is a prefix in one language may be a suffix in another and vice-versa. In English the plural morpheme *-s* is a suffix (e.g., *boys*, *machines*, *diskettes*). In Isthmus Zapotec, on the other hand, 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 “The salsa is a Latin dance.” 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”	dur + ak	“stopping place”
bat	“to sink”	bat + ak	“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”	anla + sh	“understand each other”
sev	“love”	sev + ish	“love each other”

The reciprocal suffix in these examples is pronounced as *sh* after a vowel and as *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*. We will discuss the various pronunciations of morphemes in chapter 7.

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”	cokoruha + kaka	“cause to harpoon”
salwa	“to visit”	salwa + kaka	“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”
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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 *greenish*. Also in Karuk, the suffix *-ara* has the same meaning as the English *-y*, that is, “characterized by” (*hairy* means “characterized by hair”).

aptiik “branch” aptikara “branchy”

These examples illustrate again the arbitrary nature of the sound-meaning relationship.

In Russian the suffix *-shchik* added to a noun is similar in meaning to the English suffix *-er* in words like *reader*, *teenager*, *Londoner*, *miler*, *first grader*, which may be affixed to words of different categories. The Russian suffix, however, is added to nouns only, as shown in the following examples:

Russian		Russian	
atom	“atom”	atomshchik	“atom-war monger”
baraban	“drum”	barabanshchik	“drummer”
kalambur	“pun”	kalamburshchik	“punner”
beton	“concrete”	betonshchik	“concrete worker”
lom	“scrap”	lomshchik	“salvage collector”

These examples from different languages also illustrate free morphemes like *boy* in English, *dur* in Turkish, *salwa* in Piro, and *lom* in Russian.

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 learns 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*.

English infixing has been the subject of the Linguist List, a discussion group on the Internet. The interest in infixes in English is because one can only infix full word obscenities into another word, usually 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 *in-fuggin-credible*, *un-fuckin-believable*, 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*, *abso + bloomin + lutely* occurs in one of the songs sung by Eliza Doolittle.

CIRCUMFIXES

Some languages have **circumfixes**, morphemes that are attached to another morpheme both initially and finally. These are sometimes called **discontinuous morphemes**. In Chickasaw, a Muskogean language spoken in Oklahoma, the negative is formed with both a prefix *ik-* and the suffix *-o*. The final vowel of the affirmative is deleted before the negative suffix 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 adding the prefix *ge-* and the suffix *-t* to 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 **root** and one or more affixes. A root is a lexical content morpheme that cannot be analyzed into smaller parts. Some examples of English roots are *paint* in *painter*, *read* in *reread*, and *ceive* in *conceive*. A root may or may not stand alone as a word (*paint* does; *ceive* doesn’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:

katab	“he wrote”
kaatib	“writer”
kitáab	“book”
kútub	“books”

When a root morpheme is combined with an affix, it forms a **stem**, which may or may not be a word (*painter* is both a word and a stem; *-ceive + er* is only 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

As one adds each affix to a stem, a new stem and a new word are formed.

Huckles and Ceives

It had been a rough day, so when I walked into the party I was very chalant, despite my efforts to appear grunted and console. 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.

"How I Met my Wife," by Jack Winter. *The New Yorker*, July 25, 1994.

A morpheme was defined as the basic element of meaning, a phonological form that is arbitrarily united with a particular meaning and that cannot be analyzed into simpler elements. Although it holds for most of the morphemes in a language, this definition has presented problems for linguistic analysis for many years. Consider words like *cranberry*, *huckleberry*, and *boysenberry*. The *berry* part is no problem, but *huckle* and *boysen* occur only with *berry*, as did *cran* until *cranapple* juice came on the market, and other morphologically complex words using *cran-* followed. The *boysen-* part of *boysenberry* was named for a man named Boysen who developed it as a hybrid from the blackberry and raspberry. But few people are aware of this and it is a bound stem morpheme that occurs only in this word. *Lukewarm* is another word with two stem morphemes, with *luke* occurring only in this word, because it is not the same morpheme as the name *Luke*.

Bound forms like *huckle-*, *boysen-*, and *luke-* require a redefinition of the concept of morpheme. Some morphemes have no meaning in isolation but acquire meaning only in combination with other specific morphemes. Thus the morpheme *huckle*, when joined with *berry*, has the meaning of a special kind of berry that is small, round, and purplish blue; *luke* when combined with *warm* has the meaning "sort of" or "somewhat," and so on.

Some morphemes occur only in a single word (combined with another morpheme), while other morphemes occur in many words, but seem to lack a constant meaning from one word to another. Many words of Latin origin that entered the English language after the Norman Conquest of England in 1066 have this property. For example,

the words *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, the latter from the verb *mittere*, “to send,” and the former from the verb *capere*, “to seize.” 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.

There are other words that seem to be composed of prefix + root morphemes in which the roots, like *cran-* or *-ceive*, never occur alone, but always with a specific prefix. Thus we find *inept*, but no **ept*; *ungainly*, but no **gainly*; *discern*, but no **cern*; *nonplussed*, but no **plussed*.

Similarly, the stems of *upholster*, *downhearted*, and *outlandish* do not occur by themselves: **holster* and **hearted* (with these meanings), and **landish* are not free morphemes. In addition, *downholster*, *uphearted*, and *inlandish*, their “opposites,” are not words.

To complicate things a little further, there are words like *strawberry* in which the *straw* has no relationship to any other kind of *straw*; *gooseberry*, which is unrelated to *goose*; and *blackberry*, which may be blue or red. While some of these words may have historical origins, there is no present meaningful connection. *The Oxford English Dictionary* entry for the word *strawberry* states that

The reason for the name has been variously conjectured. One explanation refers the first element to Straw . . . a particle of straw or chaff, a mote describing the appearance of the achenes scattered over the surface of the strawberry.

That may be true of the word’s origin, but today, the *straw-* in *strawberry* is not the same morpheme as that found in *straw hat* or *straw-colored*.

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. The final syllable in *father*, *er*, is not a separate morpheme, since a father is not “one who faths.” Similarly, in *water* the *-er* is not a distinct morpheme ending; *father* and *water* are single morphemes, or **monomorphemic** words. This follows from the concept of the morpheme as a sound-meaning unit.

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 — anything — prettier.” “Well, then,” the Gryphon went on, “if you don’t know what to uglify is, you are a simpleton.”

Lewis Carroll, *Alice in Wonderland*

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 we had never heard or used the word before because we know the meaning of its individual parts — the root *ugly* and the affixes — *-ify* and *-ation*.

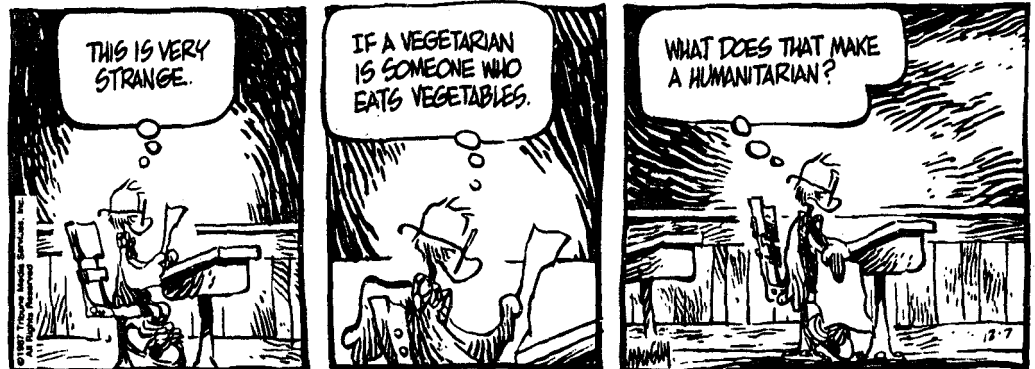
We said earlier that knowledge of morphology includes knowledge of individual morphemes, their pronunciation, and their meaning, and knowledge of the rules for combining morphemes into complex words. The Mock Turtle added *-ify* to the adjective *ugly* and formed a verb. Many verbs in English have been 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 + ify → Verb “to make Adjective”
 Verb + cation → Noun “the process of making Adjective”

Derivational Morphology

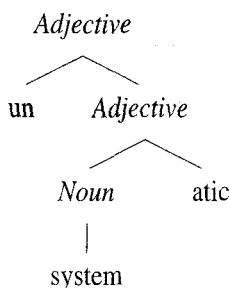
Bound morphemes like *-ify* and *-cation* are called **derivational morphemes**. When they are added to a root morpheme or stem, a new word with a new meaning is derived. The addition of *-ify* to *pure* — *purify* — means “to make pure” and the addition of *-ation* — *purification* — means “the process 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**.



The Hierarchical Structure of Words

We saw above 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*.

Like the property of discreteness discussed earlier, 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.

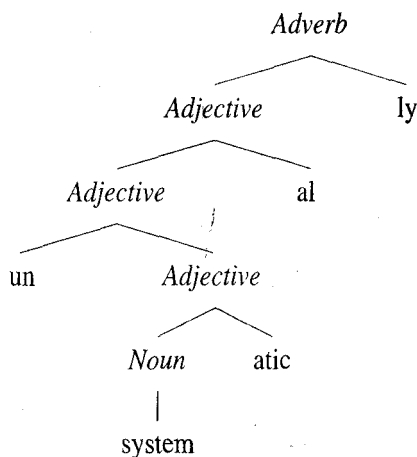
Further morphological rules can be applied to the structure given above. For example, English has a derivational suffix *-al*, as in *egotistical*, *fantastical*, and *astronomical*. In these cases, *-al* is added to an adjective —*egotistic*, *fantastic*, *astronomic*— to form a new adjective. The rule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

3. Adjective + al → Adjective

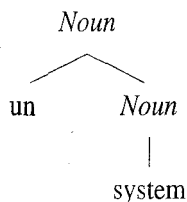
Another affix is *-ly*, which is added to adjectives —*happy*, *lazy*, *hopeful*— to form adverbs *happily*, *lazily*, *hopefully*. Following is the rule for *-ly*:

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 a nonword, **unsystem*.

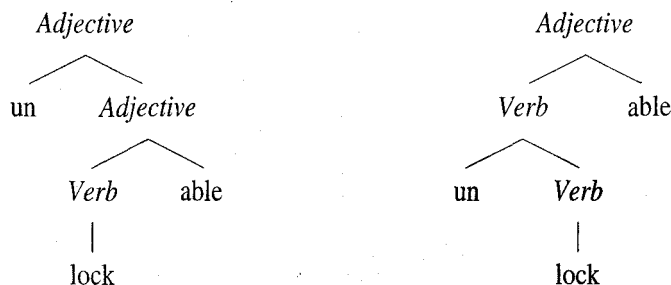


**Unsystem* is not a possible word because there is no rule of English that allows *un-* to be added to nouns. The large soft-drink company whose ad campaign promoted the *Uncola* successfully flouted this linguistic rule to capture people's attention. Part of our linguistic competence includes the ability to recognize possible vs. impossible words, like **unsystem* and **Uncola*. Possible words are those that conform to the rules of morphology (as well as of phonology; see chapter 7); impossible words are those that do not.

Tree diagrams are the linguist's hypothesis of how speakers represent the internal structure of the morphologically complex words in their language. In speaking and writing, we string morphemes together sequentially as in *un + system + atic*. As shown by tree diagrams, however, our mental representation of words is much more complex.

The hierarchical organization of words is most 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*, *unzippable*, and *unlatchable*, among others. The ambiguity arises because the prefix *un-* can combine with an adjective, as illustrated in rule 2 above, or it can combine with a verb, as in *undo*, *unstaple*, *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 important 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 two different structures.

More about Derivational Morphemes

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 root or stem, 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*, *adore + 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	Verb to Noun	Adjective to Adverb
boy + ish	acquitt + al	exact + ly
virtu + ous	clear + ance	quiet + ly
Elizabeth + an	accus + ation	
pictur + esque	confer + ence	
affection + ate	sing + er	
health + ful	conform + ist	
alcohol + ic	predict + ion	
life + like	free + dom	

Noun to Verb	Adjective to Noun	Verb to Adjective
moral + ize	tall + ness	read + able
vaccin + ate	specific + ity	creat + ive
brand + ish	feudal + ism	migrat + ory
haste + n	abstract + ion	run + (n)y

Not all derivational morphemes cause a change in grammatical class.

Noun to Noun	Verb to Verb	Adjective to Adjective
friend + ship	un + do	pink + ish
human + ity	re + cover	in + flammable

Many prefixes fall into this category:

a + moral	mono + theism
auto + biography	re + print
ex + wife	semi + annual
super + human	sub + minimal

There are also suffixes of this type:

vicar + age	New Jersey + ite
old + ish	fadd + ist
Paul + ine	music + ian
America + n	pun + ster

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 and were not formed. Sometimes, however, alternative forms coexist: for example, *Chomskyan* and *Chomskyist* and perhaps even *Chomskyite* (all meaning “follower of Chomsky’s views of linguistics”). *Linguist* and *linguistician* are both used, but the possible word *linguite* is not.

Lexical Gaps

The redundancy of alternative forms such as those mentioned, all of which conform to the regular rules of word formation, may explain some of the **accidental, or lexical, gaps** in the lexicon. Accidental gaps are well-formed but nonexistent words. The actual words in the language constitute only a subset of the possible words. Speakers of a language may know tens of thousands of words. Dictionaries, as we noted, include hundreds of thousands of words, all of which are known by some speakers of the language. But no dictionary can list all **possible words** since it is possible to add to the vocabulary of a language in many ways. (Some of these will be discussed here and some in chapter 11 on language change.) There are always gaps in the lexicon — words that are not in the dictionary but that can 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*). Note that the sequence of sounds must be in keeping with the constraints of the language. **bnick*



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is not a "gap" because no word in English can begin with a *bn*. We will discuss such constraints in chapter 7.

Other gaps result when possible combinations of morphemes never come into use. Speakers can distinguish between impossible words such as **unsystem* and **speakly*, and possible, but nonexistent words such as *disobvious*, *linguisticism*, and *antiquify*. The ability to do this 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.

Rule Productivity

Some morphological rules are **productive**, meaning that they can be used freely to form new words from the list of free and bound morphemes. The suffix *-able* appears to be a morpheme that 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*, *blam(e) + able*, *pass + able*, *change + able*, *breath + able*, *adapt + able*, and so on. The meaning of *-able* has also been given as "fit for doing" or "fit for being done." The productivity of this rule is illustrated by the fact that we find *-able* affixed to new verbs such as *downloadable* and *faxable*.

We have already noted that there is a morpheme in English meaning "not" that has the form *un-* and that, when combined with adjectives like *afraid*, *fit*, *free*, *smooth*, *American*, and *British*, forms the **antonyms**, or **negatives**, of these adjectives. For example, *unafraid*, *unfit*, *un-American*, and so on. Note that unlike *-able*, *un-* does not change the grammatical category of the stem it attaches to.

We also saw that the prefix *un-* can be added to derived adjectives that have been formed by morphological rules:

un + believe + able
 un + accept + able
 un + speak + able
 un + lock + able

We can also add *un-* to morphologically complex verbs that consist of a verb plus a particle plus *-able* such as:

pick + up +able
 turn + around +able
 chop + off + able
 talk + about + able

Un- prefixation derives the following words:

un + pick + up + able,
 un + chop + off + able,
 un + talk + about + 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*. The starred forms that follow may be merely accidental gaps in the lexicon. If someone refers to a person as being **unsad* we would know that the person referred to was “not sad,” and an **unbrave* person would not be brave. But, as the linguist Sandra Thompson³ points out, it may be the case that the “*un-*Rule” is most productive for adjectives that are themselves derived from verbs, such as *unenlightened*, *unsimplified*, *uncharacterized*, *unauthorized*, *undistinguished*, and so on.

Morphological rules may be more or less productive. The rule that adds an *-er* to verbs in English to produce a noun meaning “one who performs an action (once or habitually)” appears to be a very productive morphological rule. Most English verbs accept this suffix: *examiner*, *exam-taker*, *analyzer*, *lover*, *hunter*, *predictor*, and so forth (*-or* and *-er* have the same pronunciation and are the same morpheme even though they are spelled differently). Now consider the following:

<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*, *redden*, *weaken*, and *deepen*. Still, the phrase “*The fiercity of the lion” sounds somewhat strange, as does the sentence “*I’m going to thinnen the sauce.” Someone may use the word *coolth*, but, as Thompson points out, when words such as *fiercity*, *thinnen*, *fullen*, and *coolth* are used, usually it is either an error or an attempt at humor. It is possible that in such cases a morphological rule that was once productive (as shown by the existence of related pairs like *scarce/scarcity*) is no longer so. Our knowledge of the related pairs, however, may permit us to use these examples in forming new

³ S. A. Thompson. 1975. “On the Issue of Productivity in the Lexikon,” *Kritikon Litterarum* 4:332–49.

words, by analogy with the existing lexical items. Other derivational morphemes in English are not very productive, such as the suffixes meaning “diminutive,” as in the words *pig + let* and *sap + ling*.

In the morphologically complex words that we have seen so far, we can easily predict the meaning based on the meaning 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:

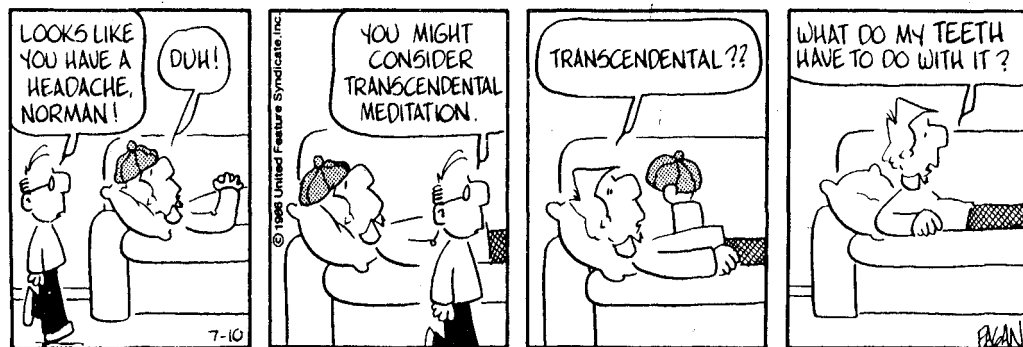
unloosen	“loosen, let loose”
unrip	“rip, undo by ripping”
undo	“reverse doing”
untread	“go back through in the same steps”
unearth	“dig up”
unfrock	“deprive (a cleric) of ecclesiastic rank”
unnerv	“fluster”

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.

“Pullet Surprises”

That speakers of a language know the morphemes of that language, and the rules for word formation is shown as much by the errors made as by the nondeviant forms produced. Morphemes combine to form words. These words form a part our internal dictionaries. Given our knowledge of the morphemes of the language and the morphological rules, we may guess the meaning of a word we do not know. Sometimes we guess wrong.

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 stu-



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

dents' knowledge of English morphology. Consider the creativity of these students 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."

Sign Language Morphology

It appears that sign languages are rich in morphology. Like spoken languages, 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 signed words.

Figure 3.1 illustrates the derivational process in ASL that is equivalent to the formation of the nouns *comparison* and *measuring* from the verbs *compare* and *measure* in

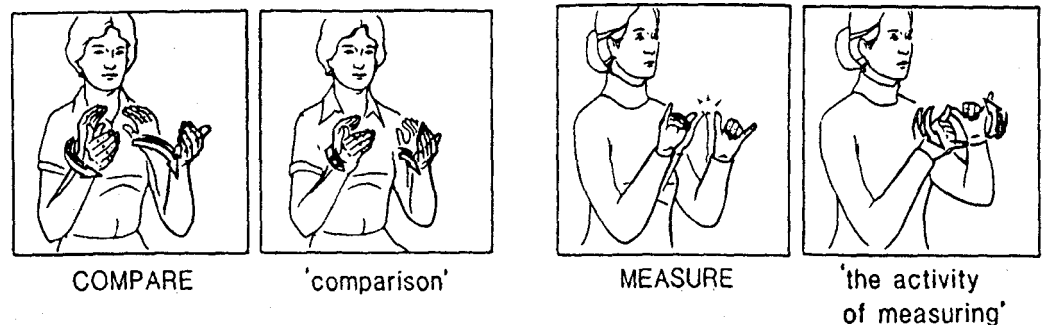


Figure 3.1 Derivationally related sign in ASL. (Copyright © 1987 MIT Press. Reprinted by permission of the MIT Press.)⁵

⁵ H. Poizner, E. Klima, and U. Bellugi. 1987. *What the Hands Reveal about the Brain*. Cambridge, MA: MIT Press.

English. Everything about the root morpheme remains the same except for the movement of the hands.

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.

Word Coinage

We have seen that new words may be added to the vocabulary of a language by derivational processes. New words also enter a language in a variety of other ways. Some are created outright to fit some purpose. The advertising industry has added many words to English, such as *Kodak*, *nylon*, *Orlon*, and *Dacron*. Specific brand names such as *Xerox*, *Kleenex*, *Jell-O*, *Frigidaire*, *Brillo*, and *Vaseline* are now sometimes used as the generic name for different brands of these types of products. Notice that some of these words were created from existing words: *Kleenex* from the word *clean* and *Jell-O* from *gel*, for example.

In computer speech processing, the new words *cepstrum* and *cepstral* were purposely formed by reordering the letters of *spectrum* and *spectral*. Speakers do not agree on the pronunciation of these two words. Some say “sepstrum” with an *s*-sound, since the *c* precedes an *e*. Others say “kepstrum” since the *c* is pronounced as a *k* in the source word *spectrum*. Greek roots borrowed into English have also provided a means for coining new words. *Thermos* “hot” plus *metron* “measure” gives us *thermometer*. From *akros* “topmost” and *phobia* “fear,” we get *acrophobia*, “dread of heights.” To avoid going out Friday the thirteenth, you may say that you have *triskaidekaphobia*, a profound fear of the number 13. An ingenious cartoonist, Robert Osborn, has “invented” some phobias, to each of which he gives an appropriate name.⁶

logizomechanophobia	“fear of reckoning machines” from Greek <i>logizomai</i> “to reckon or compute” + <i>mekhane</i> “device” + <i>phobia</i>
ellipsosyllabophobia	“fear of words with a missing syllable” from Greek <i>elleipsis</i> “a falling short” + <i>syllabē</i> “syllable” + <i>phobia</i>
pornophobia	“fear of prostitutes” from Greek <i>porne</i> “harlot” + <i>phobia</i>

Latin, like Greek, has also provided prefixes and suffixes that are used productively with both native and nonnative roots. The prefix *ex-* comes from Latin:

ex-husband ex-wife ex-sister-in-law

⁶ *An Osborn Festival of Phobias*. Copyright © 1971 Robert Osborn. Text copyright © 1971 Eve Wengler. Used by permission of Liveright Publishers, New York.

The suffix *-able/-ible* that was discussed earlier is also Latin, borrowed via French, and can be attached to almost any English verb, as we noted, and as further illustrated in:

writable readable answerable movable

Compounds

... the Houynhnms 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, Ynlhmawihlma Yahoo, and an ili contrived House, Ynholmhmrohlnw Yahoo.

Jonathan Swift, *Gulliver's Travels*

Two or more words may be joined to form new, **compound** words. The kinds of combinations that occur in English are nearly limitless, as the following table of compounds shows. Each entry in the table represents dozens of similar combinations.

	Adjective	Noun	Verb
Adjective	bittersweet	poorhouse	whitewash
Noun	headstrong	homework	spoonfeed
Verb	—	pickpocket	sleepwalk

Frigidaire is a compound formed by combining the adjective *frigid* with the noun *air*. Some compounds that have been introduced very recently into English are *carjack*, *mall rat*, *road rage*, *palm pilot*, and *slow-speed chase*. (Compounds are variously spelled with dashes, spaces, or nothing between the individual words.)

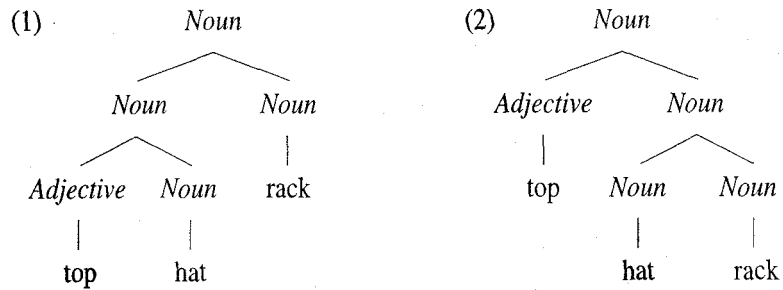
When the two words are in the same grammatical category, the compound will be in this category: noun + noun — *girlfriend*, *fighter-bomber*, *paper clip*, *elevator-operator*, *landlord*, *mailman*; adjective + adjective — *icy-cold*, *red-hot*, and *worldly-wise*. In English, the rightmost word in 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 will be the grammatical category of the compound: noun + adjective = adjective — *headstrong*, *watertight*, *lifelong*; verb + noun = noun — *pickpocket*, *pinchpenny*, *daredevil*, *sawbones*. On the other hand, compounds formed with a preposition are in the category of the nonprepositional part of the compound; *overtake*, *hanger-on*, *undertake*, *sundown*, *afterbirth*, and *downfall*, *uplift*.

Though 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*.”⁷

⁷ Dr. Seuss. 1965. *Fox in Sox*. New York: Random House, p. 51.

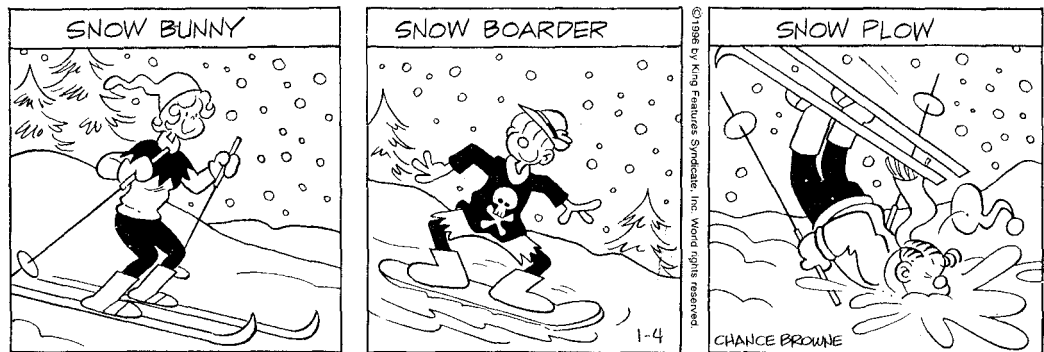
Spelling does not tell us what sequence of words constitutes a compound; whether a compound is spelled with a space between the two words, with a hyphen, or with no separation at all depends on the idiosyncrasies of the particular compound, as shown, for example, in *blackbird*, *gold-tail*, and *smoke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

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



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Other compounds reveal other meaning relations between the parts, which are not entirely consistent because many compounds are idiomatic (idioms are discussed in chapter 5). 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 falls, 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 example so far the meaning of each compound includes at least to some extent the meanings of the individual parts. However, many compounds 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 *flatfoot*, 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 compounds differs from the way we pronounce the sequence of two words forming a noun phrase. In a compound, the first word is usually stressed (pronounced somewhat louder and higher in pitch) and in a noun phrase the second word is stressed. Thus we stress *Red* in *Redcoat* but *coat* in *red coat*. (Stress, pitch, and other “prosodic” features are discussed in chapters 6 and 7.)

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 *cetyrextaznyi*, “four-storied”; Spanish *tocadiscos*, “record player.” In the Native American language Papago the word meaning “thing” is *haʔichu*, and it combines with *doakam*, “living creatures,” to form the compound *haʔichu doakam*, “animal life.”

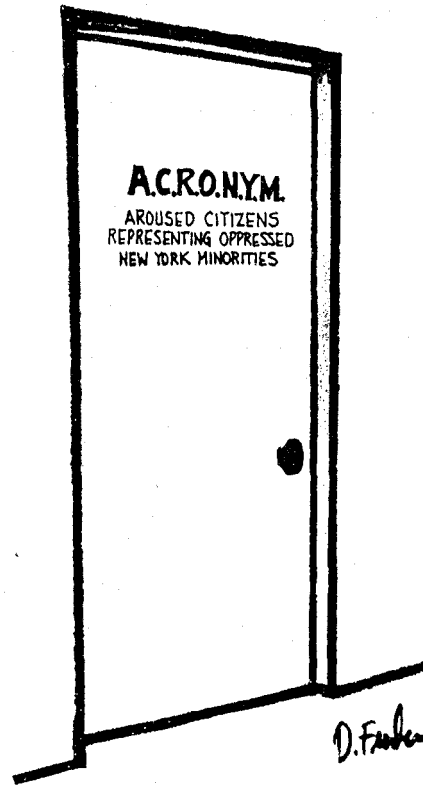
In Twi, by combining the word meaning “son” or “child,” *oba*, with the word meaning “chief,” *ɔhene*, one derives the compound *ɔheneba*, meaning “prince.” By adding the word “house,” *ofi*, to *ɔhene*, the word meaning “palace,” *ahemfi*, is derived. The other changes that occur in the Twi compounds 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.

Acronyms

Acronyms are words derived from the initials of several words. Such words are pronounced as the spelling indicates: *NASA* from *National Aeronautics and Space Agency*, *UNESCO* from *United Nations Educational, Scientific, and Cultural Organization*, and



Drawing by D. Fradon. Copyright © 1974 The New Yorker Collection. All rights reserved.

UNICEF from *United Nations International Children's Emergency Fund*. *Radar* from "radio detecting *and* ranging," *laser* from "light amplification by stimulated emission of radiation," *scuba* from "self-contained underwater breathing apparatus," and *RAM* from "random access memory," show the creative efforts of word coiners, as does *snafu*, which was coined by soldiers in World War II and is rendered in polite circles as "situation normal, all fouled up." Recently (1980s) coined additions are *AIDS*, from the initials of *acquired immune deficiency syndrome*, and its partner *HIV* from *human immunodeficiency virus*. Acronyms may be built on acronyms. *ROM* is a computer acronym for "read-only memory"; *PROM* is "programmable read-only memory"; and *EPROM* "erasable programmable read-only memory."⁸ When the string of letters is not easily pronounced as a word, the acronym is produced by sounding out each letter, as in *NFL* for *National Football League* and *UCLA* for *University of California, Los Angeles*.

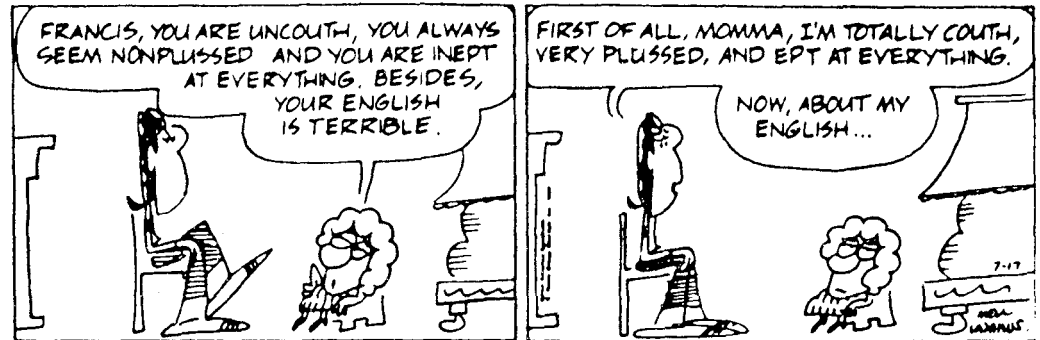
Acronyms are being added to the vocabulary daily with the proliferation of computers and widespread use of the Internet, including *MORF* (*male or female?*), *FAQ* (*frequently asked questions*), *WYSIWYG* (*what you see is what you get*) and *POP* (*post*

⁸ Contributed by Joan M. Flaherty.

office protocol), among many more. Other common acronyms are *FYI* (for your information), *BTW* (by the way), and *TGIF* (thank God it's Friday).

Back-Formations

Ignorance sometimes can be creative. 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*, and *edit* all came into the language as back-formations — of *hawker*, *stoker*, *swindler*, and *editor*. *Pea* was derived from a singular word, *pease*, by speakers who thought *pease* was a plural. 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 (although the speakers who use it may be), and many words have entered the language this way.



"Momma" by permission of Mel Lazarus and Creators Syndicate.

Some word coinage, similar to the kind of wrong morphemic analysis that produces back-formations, is deliberate. The word *bikini* is from the Bikini atoll of the Marshall Islands. Because the first syllable *bi-* in other words, like *bipolar*, means "two," some clever person called a topless bathing suit a *monokini*. Historically, a number of new words have entered the English lexicon in this way. Based on analogy with such pairs as *act/action*, *exempt/exemption*, *revise/revision*, new words *resurrect*, *preempt*, and *televise* were formed from the existing words *resurrection*, *preemption*, and *television*.

Abbreviations

Abbreviations of longer words or phrases also may become lexicalized, that is, words in their own right. *Fax* for *facsimile*, *telly*, the British word for *television*, *prof* for *professor*, *piano* for *pianoforte*, and *gym* for *gymnasium* are only a few examples of such "clipped" forms that are now used as whole words. Other examples are *ad*, *bike*, *math*, *gas*, *phone*, *bus*, and *van* (from *advertisement*, *bicycle*, *mathematics*, *gasoline*, *telephone*, *omnibus*, and *caravan*). More recently, *dis* and *rad* (from *disrespect* and *radical*) have entered the language, and *dis* has come to be used as a verb meaning "to show disrespect." This process is sometimes called **clipping**.

Words from Names

Eponyms are words derived from proper names and are another of the many creative ways that the vocabulary of a language expands.

Willard R. Espy has compiled a book of fifteen hundred such words.⁹ They include common and widely used terminology:

sandwich	Named for the fourth Earl of Sandwich, who put his food between two slices of bread so that he could eat while he gambled.
robot	After the mechanical creatures in the Czech writer Karel Capek's play <i>R.U.R.</i> , the initials standing for "Rossum's Universal Robots."
gargantuan	Named for Gargantua, the creature with a huge appetite created by Rabelais.
jumbo	After an elephant brought to the United States by P. T. Barnum. ("Jumbo olives" need not be as big as an elephant, however.)

Espy admits to ignorance of the Susan, an unknown servant, from whom we derived the compound *lazy susan*, or the Betty or Charlotte or Chuck from whom we got *brown betty*, *charlotte russe*, or *chuck wagon*. He does point out that *denim* was named for the material used for overalls and carpeting, which originally was imported "de Nîmes" ("from Nîmes") in France, and *argyle* from the kind of socks worn by the chiefs of Argyll of the Campbell clan in Scotland.

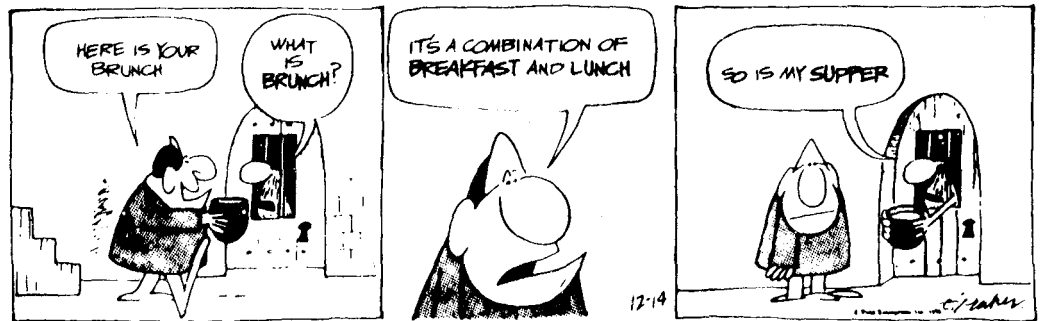
The word *paparazzo*, "a freelance photographer who doggedly pursues celebrities," was a little known word until the death of Diana, Princess of Wales, in 1997, who was hounded by paparazzi (plural) before her automobile wreck. This eponym comes from the news photographer character Signor Paparazzo in the motion picture *La Dolce Vita*.

Blends

Two words may be combined to produce **blends**. Blends are similar to compounds but parts of the words that are combined are deleted, so they are "less than" compounds. *Smog*, from *smoke* + *fog*; *motel*, from *motor* + *hotel*; *infomercial* from *info* + *commercial*; and *urinalysis*, from *urine* + *analysis* are examples of blends that have attained full lexical status in English. The word *cranapple* may be a blend of *cranberry* + *apple*. *Broasted*, from *broiled* + *roasted*, is a blend that has limited acceptance in the language; as does Lewis Carroll's *chortle*, from *chuckle* + *snort*. Carroll is famous for both the coining and the blending of words. In *Through the Looking-Glass* he describes the "meanings" of the made-up words in "Jabberwocky" as follows:

. . . "Brillig" means four o' clock in the afternoon — the time when you begin broiling things for dinner. . . . "Slithy" means "lithe and slimy." . . . You see

⁹ W. R. Espy. 1978. *O Thou Improper, Thou Uncommon Noun: An Etymology of Words That Once Were Names*. New York: Clarkson N. Potter.



"The Wizard of Id" by permission of Johnny Hart and Creators Syndicate, Inc.

it's like a portmanteau — there are two meanings packed up into one word. . . . "Toves" are something like badgers — they're something like lizards — and they're something like corkscrews . . . also they make their nests under sundials — also they live on cheese. . . . To "gyre" is to go round and round like a gyroscope. To "gimble" is to make holes like a gimlet. And "the wabe" is the grass-plot round a sun-dial. . . . It's called "wabe" . . . because it goes a long way before it and a long way behind it. . . . "Mimsy" is "flimsy and miserable" (there's another portmanteau . . . for you).

Carroll's "portmanteaus" are what we have called blends, and such words can become part of the regular lexicon.

Blending is even done by children. The blend *crocogator* from *crocodile* + *alligator* is attributed to three-year old Elijah Peregrine. Grandmothers are not to be left out, and a Jewish one of African descent that we know came up with *shugeleh*, "darling," which we think is a blend of *sugar* + *bubeleh*, and which we confess we don't know how to spell. (*Bubeleh* is a Yiddish term of endearment.)

Grammatical Morphemes

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

"Found what?" said the Duck.

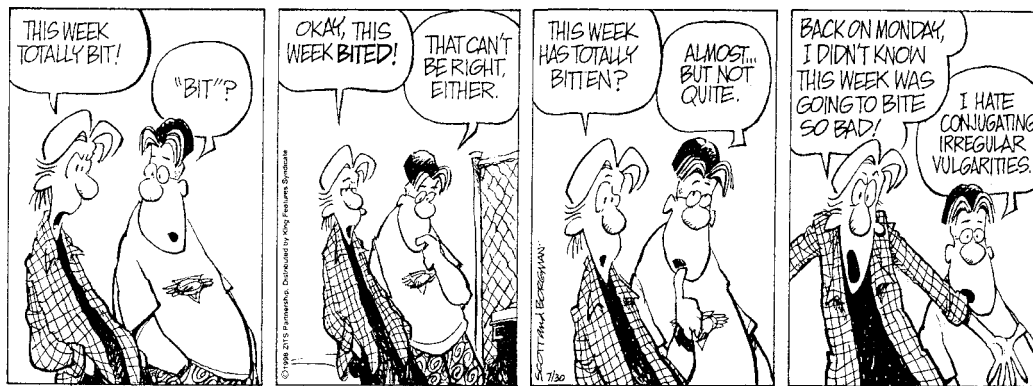
"Found it," the Mouse replied rather crossly; "of course you know what 'it' means."

"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*

In the discussion of derivational morphology we saw that certain morphemes such as *-ceive* or *-mit* have meaning only when combined with other morphemes in a word, for example *transmit*, *remit*, *receive*, and *deceive*. Similarly, there are morphemes that have "meaning" only in combination with other words in a sentence. For example, what is the meaning of *it* in "It's hot in July" or "The Archbishop found it advisable"? What is the meaning of *to* in *He wanted her to go*. Function words such as *it* and *to* have a strictly

grammatical meaning, or function, in the sentence. This means that they do not have any clear lexical meaning or concept associated with them. They are in the sentence because they are required by the rules of sentence formation—the syntax. For example, *to* in connection with a verb has the grammatical function of making the sentence an infinitive. Similarly, *have* in “The cows have walked here” marks the sentence as a present perfect, and the different forms of *be* in “The baby *is* crying” and “The baby’s diaper *was* changed” function as a progressive and passive marker, respectively.



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Inflectional Morphemes

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, gender, case, and so forth. Such bound morphemes are called **inflectional morphemes**. They never change the syntactic category of the words or morphemes 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, 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*.

English is no longer a highly inflected language. But we do have other inflectional endings such as the plural suffix, which is attached to certain singular nouns, as in *boy/boys* and *cat/cats*. At the present stage of English history, there are a total of eight bound inflectional affixes:

English Inflectional Morphemes

-s	third-person singular present
-ed	past tense
-ing	progressive
-en	past participle
-s	plural
-’s	possessive
-er	comparative
-est	superlative

Examples

She wait- s at home.
She wait- ed at home.
She is eat- ing the donut.
Mary has eat- en the donuts.
She ate the donut- s .
Disa’s hair is short.
Disa has short- er hair than Karin.
Disa has the short- est hair.

Inflectional morphemes in English typically follow derivational morphemes. 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*. However, with compounds the situation is complicated. Thus, 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* in a legal setting, but for most of the rest of us it’s *court-martials*.

Compared to many languages of the world, English has relatively little inflectional morphology. Some languages are highly inflected. In Swahili, a Bantu language spoken in eastern and central Africa, a verb can be inflected with up to eight morphemes. For example, in *hatutawapikishia* the verb *pik* “to cook” has negative tense, subject agreement, object agreement, indicative mood, and prefixes as well as suffixes:

Ha + tu + ta + wa + pik + i + sh + i + a “We will not have made him
cook for them”¹⁰

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”

Some languages can also add content morphemes to the verb. Many North American languages are of this type. For example, in Mohawk the word *wahonwatia’tawit-sherahetkenhten* means “she made the thing that one puts on one’s body ugly for him.” In such languages words are equivalent to sentences. As the linguist Mark Baker notes, languages like Mohawk “use a different division of labor from languages like English, with more burden on morphology and less on syntax to express complex relations.”

Students often ask for definitions of derivational morphemes as opposed to inflectional morphemes. There is no easy answer. Perhaps the simplest answer is that derivational morphemes are affixes that are not inflectional. Inflectional morphemes signal grammatical relations and are required by the rule of sentence formation. Derivational

¹⁰ Swahili examples provided by Kamil Deen.

morphemes, when affixed to roots and stems, change the grammatical word class and/or the basic meaning of the word, which may then be inflected as to number (singular or plural), tense (present, past, future), and so on.

Exceptions and Suppletions

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



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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.

Irregular, or **suppletive**, forms are treated separately in the grammar. That is, one cannot use the regular rules of inflectional morphology to add affixes to words that are exceptions like *child/children*, but must replace the noninflected form with another word. It is possible that for regular words, only the singular form need be specifically stored in the lexicon since we can use the inflectional rules to form plurals. But this can't be so with suppletive exceptions.

When a new word enters the language it is generally the regular inflectional rules that 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 clip of *facsimile*. Never fear: its plural is *faxes*. The exception to this may be a loan word, 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 seem to 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*. Thousands of years ago the Hindu grammarians suggested that some morphemes have a zero-form; that is, they have no phonological representation. Because we would like to hold to the definition of a morpheme as a constant sound-meaning form, however, we suggest

that the morpheme *hit* is marked as both present and past in the lexicon, and the morpheme *sheep* is marked as both singular and plural, and that there are no “zero-forms.”

When a verb is derived from a noun, even if it is homophonous with 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*.

Similarly, 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.”

Morphology and Syntax

“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*

Some grammatical relations can be expressed either inflectionally (morphologically) or syntactically (as part of the sentence structure). We can see this in the following sentences:

England’s queen is Elizabeth II.	The Queen of England is Elizabeth II.
He loves books.	He is a lover of books.
The planes which fly are red.	The flying planes are red.
He is hungrier than she.	He is more hungry than she.

Some of you may form the comparative of *beastly* only by adding *-er*. *Beastlier* is often used interchangeably with *more beastly*. There are speakers who say both. We know when either form of the comparative can be used, as with *beastly*, or when just one can be used, as with *curious*, as pointed out by Lewis Carroll in the quotation.

What one language signals with inflectional affixes, another does with word order, and another with function words. For example, in English, the sentence *Maxim defends Victor* means something different from *Victor defends Maxim*. The word order is critical. In Russian, all 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 zaščičajet Viktora.
 Maksim Viktora zaščičajet.
 Viktora Maksim zaščičajet.
 Viktora zaščičajet Maksim.

The inflectional suffix *-a* added to the name *Viktor* to derive *Viktora* shows that Victor, not Maxim, is defended.

Like many languages, Russian has case markers, which are grammatical morphemes added to nouns to indicate whether the noun is a subject, object, possessor, or some other grammatical role. As shown in the preceding examples, *-a* is an accusative (object) case marker, and it can also mark genitive (possession) as in *mjech’ Viktor + a* means

“Viktor’s sword.” *Viktor + u* is a dative form meaning “to Viktor,” *Viktor + om* means “by Viktor,” and *Viktor + je* means “about Viktor.” Many of the grammatical relations that Russian expresses with case morphology, English expresses with prepositions.¹¹

In English, to convey the future meaning of a verb we must use a function word *will*, as in “John will come Monday.” In French, the verb is inflected with a future tense morpheme. Notice the difference between “John is coming Monday,” *Jean vient lundi*, and “John will come Monday,” *Jean viendra lundi*. Similarly, where English uses the grammatical markers *have* to form a perfect sentence and *be* to form a passive sentence, other languages use affixing to achieve the same meanings, as illustrated with Swahili. In Swahili the morpheme *-me* is a perfect marker and the morpheme *-w* is a passive marker:

<i>ni+me+pig+a m+pira</i>	<i>nimepiga mpira</i>	“I have hit a ball”
<i>m+pira i+li+pig+w+a</i>	<i>mpira ilipigwa</i>	“A ball was hit”

The meaning of the individual morphemes may not always indicate the meaning of a morphologically complex word. (For example, *lowlife* to mean “disreputable person.”) This problem is not true of inflectional morphology. If we know the meaning of the word *linguist*, we also know the meaning of the plural form *linguists*; if we know the meaning of the verb *analyze*, we know the meaning of *analyzed*, *analyzes*, and *analyzing*. This reveals another difference between derivational and inflectional morphology.

Figure 3.2 shows the way one may classify English morphemes.

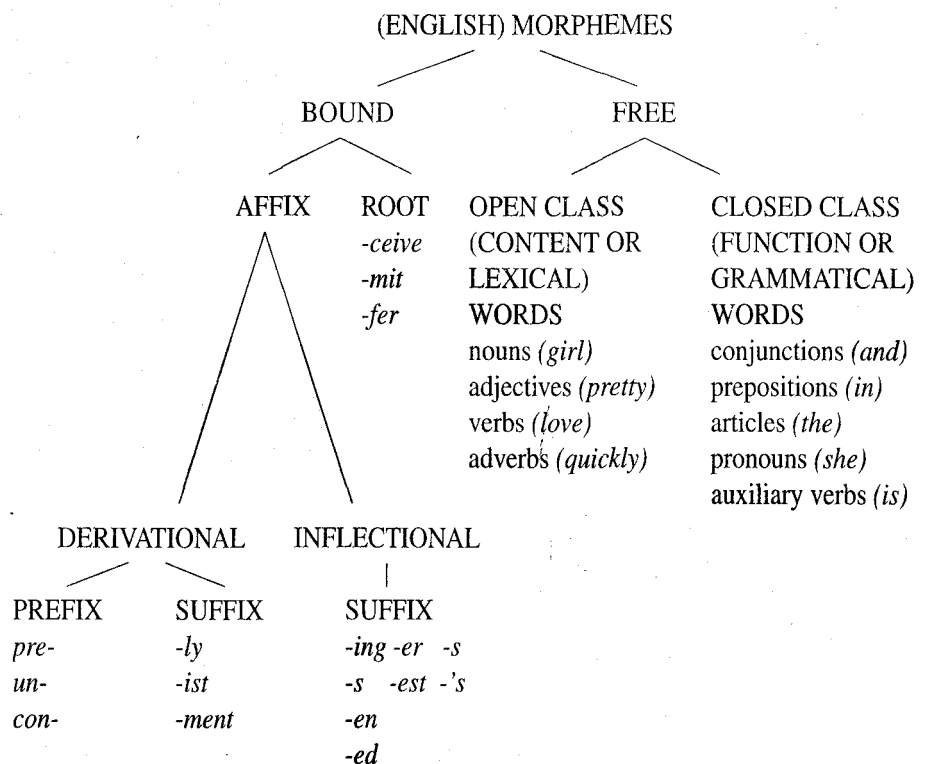


Figure 3.2 Classification of English Morphemes.

¹¹ These Russian examples were provided by Stella de Bode.

The mental grammar of the language internalized by the language learner includes a lexicon listing all the morphemes, as well as the derived words with unpredictable meanings. The morphological rules of the grammar permit speakers to use and understand the morphemes and words in forming and understanding sentences, and in forming and understanding new words.

Morphological Analysis: Identifying Morphemes

Speakers of a language have the knowledge to perceive the component morphemes of a word since their mental grammars include a mental lexicon of morphemes and the morphological rules for their combination. Of course, there are mistakes while learning, but these are quickly remedied. (See chapter 8 for details of how children learn their language.)

Suppose you didn't know English and were a linguist from the planet Mars wishing to analyze the language. How would you discover the morphemes of English? How would you determine whether a word in that language had one, two, or more morphemes?

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

etc.

To determine what the morphemes are in such a list, the first thing a field linguist would do is to see if there are forms that mean the same thing in different words, that is, to look for **recurring** forms. We find them: *ugly* occurs in *ugly*, *uglier*, *ugliest*, all three of which words 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 asking additional questions of our English speaker 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*, *umber*, *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.

Once you have practiced on the morphology of English, you might want to go on to describe another language. A “language” called Paku was invented by a linguist for an old 1970s TV series called *Land of the Lost*. 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 Martian 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 all 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.

While these are rather simple examples of how one proceeds to conduct a morphological analysis, the principles remain the same, and by studying them you are on the road to becoming a morphologist.



Summary

Knowing a language means knowing the words of that language. When you know a word you know both its **form** (sound) and its **meaning**; these are inseparable parts of the linguistic **sign**. The relationship between the form and meaning is **arbitrary**. That is, by hearing the sounds (form) you cannot know the meaning of those sounds without having learned it previously.

Each root, inflectional, and derivational morpheme is stored in your mental **lexicon** with information on its pronunciation (phonological representation), its meaning (se-

mantic properties), and its syntactic category. Also contained in the lexicon are morphologically complex words whose meanings are unpredictable. For literate speakers, its spelling or **orthography** will also be present.

In spoken language, words are not separated by pauses (or spaces as in written language). One must know the language in order to segment the stream of speech into separate words.

Words are not the most elemental sound-meaning units; some words are structurally complex. The most elemental grammatical units in a language are **morphemes**. A morpheme is the minimal unit of linguistic meaning or grammatical function. Thus, *moralizers* is an English word composed of four morphemes: *moral* + *ize* + *er* + *s*.

The study of word formation and the internal structure of words is called **morphology**. Part of our linguistic competence includes knowledge of the morphology of the language. Morphemes combine according to the morphological rules of the language. A word consists of one or more morphemes. Lexical content morphemes that cannot be analyzed into smaller parts are called **root** morphemes. When a root morpheme is combined with affix morphemes it forms a **stem** or word. Other affixes can be added to a stem to form a more complex stem which may also be a word.

Some morphemes are **bound** in that they must be joined to other morphemes, are always parts of words, and are never words by themselves. Most morphemes are **free** in that they need not be attached to other morphemes; *free*, *king*, *serf*, and *bore* are free morphemes; *-dom*, as in *freedom*, *kingdom*, *serfdom*, and *boredom* is a bound morpheme. **Affixes**, that is, **prefixes**, **suffixes**, **infixes**, and **circumfixes**, are bound morphemes. Prefixes occur before, suffixes after, infixes in the middle of, and circumfixes around stems or roots.

Some morphemes, like *huckle* in *huckleberry* and *-ceive* in *perceive* and *receive*, have constant phonological form but meanings determined only by the words in which they occur. They are also bound morphemes.

Lexical content, or **root**, morphemes constitute the major word classes — nouns, verbs, adjectives, adverbs. These are **open class** items because their classes are easily added to.

Morphemes may be **derivational** or **inflectional**. **Morphological rules** are rules of word formation. Derivational morphemes, when added to a root or stem, may change the syntactic word class and/or the meaning of the word. For example, adding *-ish* to the noun *boy* derives an adjective, and prefixing *un-* to *pleasant* changes the meaning by adding a negative element. Inflectional morphemes are determined by the rules of syntax. They are added to complete words, whether simple **monomorphemic** words or complex **polymorphemic** words (i.e., words with more than one morpheme). Inflectional morphemes never change the syntactic category of the word.

Grammatical morphemes or **function words** constitute a **closed class**; that is, new function words do not enter the language. Function words and bound inflectional morphemes are inserted into sentences according to the syntactic structure. The past tense morpheme, often written as *-ed*, is added as a suffix to a verb, and the future tense morpheme *will*, is inserted in a sentence according to the syntactic rules of English.

There is a continuum of languages determined by how much they rely on morphology to express linguistic relations. English has relatively little reliance on morphology compared to Mohawk, in which a word equals a sentence. Between English and

Mohawk are languages like Swahili and Italian, which use affixation for some but not all grammatical information.

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

Grammars also include ways of adding words and morphemes to the lexicon. Words can be **coined** outright, limited only by the coiner's imagination and the phonetic constraints of English word formation. **Compounds** are also a source of new words. Morphological rules combine two or more words to form complex combinations like *lamb chop*, *deep-sea diver*, and *laptop*, a word spawned by the computer industry. Frequently, the meaning of compounds cannot be predicted from the meanings of their individual morphemes.

Acronyms are words derived from the initials of several words — like *AWOL*, which came into the language as the initials for “away without leave.” **Blends** are similar to compounds but usually combine shortened forms of two or more morphemes or words. *Brunch*, a late morning meal, is a blend of *breakfast* and *lunch*. **Eponyms** (words taken from proper names such as *john* for “toilet” or “prostitute’s customer”), **back-formations**, and **abbreviations** also add to the given stock of words.

While the particular morphemes and the particular morphological rules are language-dependent, the same general processes occur in all languages.



References for Further Reading

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Exercises

1. Here is how to estimate the number of words in your mental lexicon. Consult any standard dictionary.
 - a. Count the number of entries on a typical page. They are usually bold-faced.

- 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, 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 percent 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
 - b. befriended
 - c. televise
 - d. margin
 - e. endearment
 - f. psychology
 - g. unpalatable
 - h. holiday
 - i. grandmother
 - j. morphemic
 - k. mistreatment
 - l. deactivation
 - m. saltpeter
 - n. airsickness
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. A. Consider the following nouns in Zulu and proceed to look for the recurring forms. Note that the ordering of morphemes is not identical across languages. Thus, what is a prefix in one language may be a suffix or an infix in another.

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"

- What is the morpheme meaning "singular" in Zulu?
 - What is the morpheme meaning "plural" in Zulu?
 - List the Zulu stems to which the singular and plural morphemes are attached, and give their meanings.
- B. 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"

- 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?
 - What is the nominal suffix (i.e., the suffix that forms nouns)?
 - State the morphological noun formation rule in Zulu.
 - What is the stem morpheme meaning "read"?
 - What is the stem morpheme meaning "carve"?
6. Examine the following words from Michoacan Aztec.

nokali	"my house"	mopelo	"your dog"
nokalimes	"my houses"	mopelomes	"your dogs"
mokali	"your house"	ipelo	"his dog"
ikali	"his house"	nokwahmili	"my cornfield"
kalimes	"houses"	mokwahmili	"your cornfield"
		ikwahmili	"his cornfield"

- The morpheme meaning "house" is:
(1) kal (2) kali (3) kalim (4) ikal (5) ka
- The word meaning "cornfields" is:
(1) kwahmilimes (2) nokwahmilimes (3) nokwahmili (4) kwahmili
(5) ikwahmilimes
- The word meaning "his dogs" is:
(1) pelos (2) ipelomes (3) ipelos (4) mopelo (5) pelomes
- If the word meaning "friend" is *mahkwa*, then the word meaning "my friends" is:
(1) momahkwa (2) imahkwas (3) momahkwames
(4) momahkwaes (5) nomahkwames
- The word meaning "dog" is:
(1) pelo (2) perro (3) peli (4) pel (5) mopel

7. 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.
8. 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).

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

Example: -toto “child”
m- noun 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.
9. One morphological process not discussed in this chapter is **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 exemplify 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.
10. Below are listed some words followed by incorrect definitions. (All these errors are taken from Amsel Greene’s *Pullet Surprises*.)

Word	Student 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”

For each of these incorrect definitions, give some possible reasons why the students made the guesses they did. Where you can exemplify by reference to other words or morphemes, giving their meanings, do so.

11. Dal Yoo¹² expresses the belief that abbreviations and acronyms occur in the United States more than in any other country. He refers, for example, to the acronyms generated in the 1991 Gulf war, by both pro- and antiwar demonstrations such as SMASH for “Students Mobilized Against Saddam Hussein” and SCUD for “Sadly Confused Unpatriotic Demonstrators.” He also refers to a neon sign on a downtown high-rise building in Philadelphia reading PSFS for “Philadelphia Savings Fund Society,” which was referred to by a local tour guide as meaning, instead, “Philadelphia Smells Funny Some-

¹² Dal Yoo. 1994. “The World of Abbreviations and Acronyms, *Verbatim: The Language Quarterly* (summer):4-5.

times.” Dr. Yoo is a medical doctor who writes: “When I have no idea what the patient has, I apply my favorite of all the abbreviations, GOK syndrome ‘God Only Knows.’” Such acronyms show how innovative our linguistic ability is.

- a. List ten acronyms currently in use in English. Do not use the ones given in the text.
 - b. Invent ten acronyms (listing the words as well as the initials).
12. 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. Below are 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

- B. There are many more such multimorphemic words for which the root morphemes do not constitute words by themselves. See how many you can think of.
13. We have seen that the meaning of compounds is often not revealed by the meaning of its 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 which means “infielder” by combining a word which means “diminutive” with a word which 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

14. Consider the cartoon:



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The humor is based on the ambiguity of the compound *ten-page book report*. Draw two trees similar to those in the text for *top hat rack* on page 94 to reveal the ambiguity.

15. One of the characteristics of Italian is that articles and adjectives have inflectional ending that mark agreement in gender (and number) with the noun 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"

- What is the root morpheme meaning "robust"?
- What is the morpheme meaning "very"?
- What is the Italian for:
 - "a robust wine"
 - "a very red face"
 - "a very dry wine"

16. Below is a list of words from Turkish. In Turkish, articles and morphemes indicating location are affixed to the verb.

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"

- What is the Turkish morpheme meaning "to"?
- What kind of affixes in Turkish correspond to English prepositions (e.g., prefixes, suffixes, infixes, free morphemes)?
- What would the Turkish word for "from an ocean" be?
- How many morphemes are there in the Turkish word *denizimde*?

17. The following are some verb forms in Chickasaw, a member of the Muskogean family of languages spoken in south-central Oklahoma.¹³ Chickasaw is an endangered language. Currently, there are only about 100 speakers of Chickasaw, most of whom are over 70 years old.

Sachaaha	"I am tall"
Chaaha	"He/she is tall"
Chichaaha	"you are tall"
Hoochaaha	"they are tall"
Satikahbi	"I am tired"
Chitakahbitok	"you were tired"
Chichchokwa	"you are cold"
Hopobatok	"he was hungry"
Hoohopobatok	"they were hungry"
Sahopoba	"I am hungry"

¹³ The Chickasaw examples are provided by Pamela Munro.

- 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"