5 Morphology and Word Formation

KEY CONCEPTS
Words and morphemes
Root, derivational, inflectional morphemes
Morphemes, allomorphs, morphs
Words
English inflectional morphology
English derivational morphology
Compounding
Other sources of words
Registers and words
Internal structure of complex words
Classifying words by their morphology

INTRODUCTION

This chapter is about words—their relationships, their constituent parts, and their internal organization. We believe that this information will be of value to anyone interested in words, for whatever reason; to anyone interested in dictionaries and how they represent the aspects of words we deal with here; to anyone involved in developing the vocabularies of native and non-native speakers of English; to anyone teaching writing across the curriculum who must teach the characteristics of words specific to their discipline; to anyone teaching writing who must deal with the usage issues created by the fact that different communities of English speakers use different word forms, only one of which may be regarded as standard.

Exercise

1. Divide each of the following words into their smallest meaningful parts:*landholder, smoke-jumper, demagnetizability.*

2. Each of the following sentences contains an error made by a non-native speaker of English. In each, identify and correct the incorrect word.

a. I am very relax here.
b. I am very boring with this game.
c. I am very satisfactory with my life.
d. Some flowers are very attracting to some insects.
e. Many people have very strong believes.

f. My culture is very difference from yours.
g. His grades proof that he is a hard worker.
h. The T-shirt that China drawing. (from a T-shirt package from China)

In general terms, briefly discuss what English language learners must learn in order to avoid such errors.

3. Some native speakers of English use forms such as *seen* instead of *saw, come* instead of *came, aks* instead of *ask, clumb* instead of *climbed, drug* instead of *dragged, growed* instead of *grew.* Are these errors? If they are, are they the same kinds of errors made by the non-native speakers of English listed in Exercise 2? If not, what are they?

WORDS AND MORPHEMES

In traditional grammar, words are the basic units of analysis. Grammarians classify words according to their parts of speech and identify and list the forms that words can show up in. Although the matter is really very complex, for the sake of simplicity we will begin with the assumption that we are all generally able to distinguish words from other linguistic units. It will be sufficient for our initial purposes if we assume that words are the main units used for entries in dictionaries. In a later section, we will briefly describe some of their distinctive characteristics.

Words are potentially complex units, composed of even more basic units, called morphemes. A **morpheme** is the smallest part of a word that has grammatical function or meaning (NB not the smallest unit of meaning); we will designate them in braces—{ }. For example, *sawed*, *sawn*, *sawing*, and *saws* can all be analyzed into the morphemes {saw} + {-ed}, {-n}, {-ing}, and {-s}, respectively. None of these last four can be further divided into meaningful units and each occurs in many other words, such as *look**ed***, *mow**n***, *cough**ing***, *bake**s***.

{Saw} can occur on its own as a word; it does not have to be attached to another morpheme. It is a **free morpheme**. However, none of the other morphemes listed just above is free. Each must be **affixed** (attached) to some other unit; each can only occur as a part of a word. Morphemes that must be attached as word parts are said to be **bound**.

Exercise

1. Identify the free morphemes in the following words:

kissed, freedom, stronger, follow, awe, goodness, talkative, teacher, actor.

2. Use the words above (and any other words that you think are relevant) to answer the following questions:

a. Can a morpheme be represented by a single phoneme? Give examples. By more than one phoneme? Give examples.
b. Can a free morpheme be more than one syllable in length? Give examples. Can a bound morpheme? Give examples.
c. Does the same letter or phoneme—or sequence of letters or phonemes—always represent the same morpheme? Why or why not? (Hint: you must refer to the definition of morpheme to be able to answer this.)
d. Can the same morpheme be spelled differently? Give examples.
e. Can different morphemes be pronounced identically? Give examples.
f. A morpheme is basically the same as:
    i. a letter
    ii. a sound
    iii. a group of sounds
    iv. none of the above

3. The words *district* and *discipline* show that the sequence of letters *d-i-s* does not always constitute a morpheme. (Analogous examples are ***mis**sion, **mis**sile, **be**gin,* and ***re**trofit*.) List five more sequences of letters that are sometimes a morpheme and sometimes not.

4. Just for fun, find some other pairs like *disgruntled* / **gruntled* and *disgusted* / **gusted*, where one member of the pair is an actual English word and the other should be a word, but isn't.

Affixes are classified according to whether they are attached before or after the form to which they are added. **Prefixes** are attached before and **suffixes** after. The bound morphemes listed earlier are all suffixes; the {re-} of *resaw* is a prefix. Further examples of prefixes and suffixes are presented in Appendix A at the end of this chapter.

Root, derivational, and inflectional morphemes

Besides being bound or free, morphemes can also be classified as root, derivational, or inflectional. A **root** morpheme is the basic form to which other

morphemes are attached. It provides the basic meaning of the word.The morpheme {saw} is the root of *sawers*. **Derivational** morphemes are added to forms to create separate words: {-er} is a derivational suffix whose addition turns a verb into a noun, usually meaning the person or thing that performs the action denoted by the verb. For example, {paint}+{-er} creates *painter*, one of whose meanings is "someone who paints."

Inflectional morphemes do not create separate words. They merely modify the word in which they occur in order to indicate grammatical properties such as plurality, as the {-s} of *magazine**s*** does, or past tense, as the {ed} of *babecu**ed*** does. English has eight inflectional morphemes, which we will describe below.

We can regard the root of a word as the morpheme left over when all the derivational and inflectional morphemes have been removed. For example, in *immovability*, {im-}, {-abil}, and {-ity} are all derivational morphemes, and when we remove them we are left with {move}, which cannot be further divided into meaningful pieces, and so must be the word's root.

We must distinguish between a word's root and the forms to which affixes are attached. In *moveable*, {-able} is attached to {move}, which we've determined is the word's root. However, {im-} is attached to *moveable*, not to {move} (there is no word *immove*), but *moveable* is not a root. Expressions to which affixes are attached are called **bases**. While roots may be bases, bases are not always roots.

Exercise

1. Can an English word have more than one prefix? Give examples. More than one suffix? For example? More than one of each? Give examples. Divide the examples you collected into their root, derivational, and inflectional morphemes.

2. Check your dictionary to see how it deals with inflected and derived word forms. Does it list all the inflections of regular inflected words? Just irregular ones? Does it accord derived forms their own entries or include them in the entries of the forms from which they are derived?

3. Does your dictionary list bound morphemes? Which kinds?

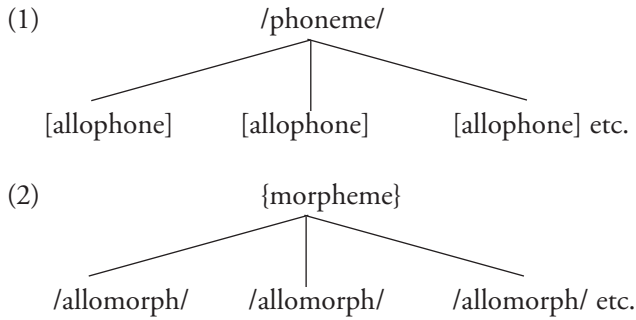
MORPHEMES, ALLOMORPHS, AND MORPHS

The English plural morpheme {-s} can be expressed by three different but

clearly related phonemic forms /əz/ or /ɪz/, /z/, and /s/. These three have in common not only their meaning, but also the fact that each contains an alveolar fricative phoneme, either /s/ or /z/. The three forms are in complementary distribution, because each occurs where the others cannot, and it is possible to predict just where each occurs: /ɪz/ after sibilants (/s, z, ʃ, ʒ, tʃ, dʒ/), /z/ after voiced segments, and /s/ everywhere else. Given the semantic and phonological similarities between the three forms and the fact that they are in complementary distribution, it is reasonable to view them as contextual pronunciation variants of a single entity. In parallel with phonology, we will refer to the entity of which the three are variant representations as a **morpheme**, and the variant forms of a given morpheme as its **allomorphs**. When we wish to refer to a minimal grammatical form merely as a form, we will use the term **morph**. Compare these terms and the concepts behind them with phoneme, allophone, and phone. (Hint: note the use of / /, [ ], and { }.)

Exercise

Consult the glossary in the chapter on Phonetics and Phonology and try to determine the meanings of the morphemes {phone}, {allo-}, and {-eme}.



WORDS

Words are notoriously difficult entities to define, both in universal and in language specific terms. Like most linguistic entities, they look in two directions—upward toward larger units of which they are parts (toward phrases), and downward toward their constituent morphemes. This, however, only helps us understand words if we already understand how they are combined into larger units or divided into smaller ones, so we will briefly discuss sev-

eral other criteria that have been proposed for identifying them.

One possible criterion is spelling: in written English text, we tend to regard as a word any expression that has no spaces within it and is separated by spaces from other expressions. While this is a very useful criterion, it does sometimes lead to inconsistent and unsatisfactory results. For instance, *cannot* is spelled as one word but *might not* as two; compounds (words composed of two or more words; see below) are inconsistently divided (cf. *influx*, *in-laws*, *goose flesh*, *low income* vs. *low-income*).

Words tend to resist interruption; we cannot freely insert pieces into words as we do into sentences. For example, we cannot separate the root of a word from its inflectional ending by inserting another word, as in **sock-**__blue__**-*s* for *blue socks*. Sentences, in contrast, can be interrupted. We can insert adverbials between subjects and predicates: *John* ***quickly*** *erased his fingerprints*. By definition, we can also insert the traditional interjections: *We will,* ***I believe,*** *have rain later today.*

In English, though by no means in all languages, the order of elements in words is quite fixed. English inflections, for example, are suffixes and are added after any derivational morphemes in a word. At higher levels in the language, different orders of elements can differ in meaning: compare *John kissed Mary* with *Mary kissed John*. But we do not contrast words with prefixed inflections with words with suffixed inflections. English does not contrast, for example, *piece* + *s* with *s* + *piece*.

In English, too, it is specific individual words that select for certain inflections. Thus the word *child* is pluralized by adding {-ren}, *ox* by adding {-en}. So if a form takes the {-en} plural, it must be a word.

So **words** are units composed of one or more morphemes; they are also the units of which phrases are composed.

English inflectional morphology

Inflectional morphemes, as we noted earlier, alter the form of a word in order to indicate certain grammatical properties. English has only eight inflectional morphemes, listed in Table 1, along with the properties they indicate.

Except for {-en}, the forms we list in Table 1 are the **regular** English inflections. They are regular because they are the inflections added to the vast majority of verbs, nouns, adjectives, and adverbs to indicate grammatical properties such as tense, number, and degree.

They are also the inflections we typically add to new words coming into the language, for example, we add {-s} to the noun *throughput* to make it plural. When we borrow words from other languages, in most cases we add the regular English inflections to them rather than borrow the inflections

they had in their home languages; for example, we pluralize *operetta* as *operetta**s*** rather than as *operett**e*** as Italian does; similarly, we sing *oratorio**s*** rather than *orator**i***. [Thanks to Paula Malpezzi-Price for help with these examples.] The regular inflections are the default inflections that learners tend to use when they don't know the correct ones (for example, *growed* rather than *grew*).

nouns:	{-s}	plural	(the bird**s**)
noun phrases:	{-s}	genitive/possessive	(the bird**'s** song)
adjectives/adverbs:	{-er}	comparative	(fast**er**)
	{-est}	superlative	(fast**est**)

verbs:	{-s}	3rd person singular present tense	(prove**s**)
	{-ed}	past tense	(prov**ed**)
	{-ing}	progressive/present participle	(is prov**ing**)
	{-en}	past participle	(has prov**en**)
			(was prov**en**)

TABLE 1: THE EIGHT ENGLISH INFLECTIONAL MORPHEMES

[Note: the regular past participle morpheme is {-ed}, identical to the past tense form {-ed}. We use the irregular past participle form {-en} to distinguish the two.]

However, because of its long and complex history, English (like all languages) has many **irregular** forms, which may be irregular in a variety of ways. First, irregular words may use different inflections than regular ones: for example, the modern past participle inflection of a regular verb is {-ed}, but the past participle of *freeze* is *froz**en*** and the past participle of *break* is *brok**en***. Second, irregular forms may involve internal vowel changes, as in *man/men*, *woman/women*, *grow/grew*, *ring/rang/rung*. Third, some forms derive from historically unrelated forms: *went*, the past tense of *go*, historically was the past tense of a different verb, *wend*. This sort of realignment is known as **suppletion**. Other examples of suppletion include *good*, *better*, and *best*, and *bad*, *worse*, and *worst*. (As an exercise, you might look up *be*, *am*, and *is* in a dictionary that provides etymological information, such as the American Heritage.) Fourth, some words show no inflectional change: *sheep* is both singular and plural; *hit* is both present and past tense, as well as past participle. Fifth, many borrowed words, especially nouns, have irregular inflected forms: *alumnae* and *cherubim* are the plurals of *alumna* and

cherub, respectively.

Irregular forms demonstrate the abstract status of morphemes. Thus the word *men* **realizes** (represents, makes real) the two morphemes {man} and {plural}; *women* realizes {woman} and {plural}; *went* realizes {go} and {past tense}. Most grammar and writing textbooks contain long lists of these exceptions.

As a final issue here we must note that different groups of English speakers use different inflected forms of words, especially of verbs. When this is the case, the standard variety of the language typically selects one and rejects the others as non-standard, or, illogically, as "not English," or worse. For example, many English speakers use a single form of *be* in the past tense (*was*) regardless of what the subject of its clause is. So they will say, *We was there yesterday*. This is an uncontroversial issue: *was* in instances like this is universally regarded as non-standard. Other forms are more controversial. For example, what is the past tense of *dive—dived* or *dove*? How are *lie* and *lay* to be used? How does your dictionary deal with such usage issues?

Exercise

1. Can you think of a reliable way to distinguish the past tense and past participle of a verb, regardless of whether it is regular or irregular? (Hint: think of words or classes of words that often occur with these forms.)

2. Check a reference grammar for further examples of irregular inflections. Also, for an excellent discussion of this and related issues, read Pinker (1999).

3. From the following words, determine the three distinct pronunciations or allomorphs of the past tense morpheme {-ed}: *towed, sighed, tapped, tabbed, tossed, buzzed, raided*. Specify the phonological environment in which each allomorph occurs. (Hints: look at the last sound of the word to which the morpheme is added and think of the allomorphs of the plural morpheme discussed earlier.)

4. Pinker (1999) notes that children learning English as their native language sometimes produce forms like *goed* and *readed*. Why do you think they do this?

5. Would you expect adult non-native learners of English to produce

forms similar to those of native speaking children? What further difficulties might non-native speakers have that native English-speaking children might not have? (Hints: think of the frequency of irregular forms in English and think of your own experience in learning a second language.)

English derivational morphology

Derivation is the process of creating separate but morphologically related words. Typically, but not always, it involves one or more changes in form. It can involve prefixing, as in *resaw*, and suffixing, as in *sawing*, *sawer*, *sawable*.

Another type of derivation, while not visible, is at least audible. It involves a change in the position of the primary stress in a word. Compare:

(3)	ˈpermit (noun)	perˈmit (verb)
	ˈcontact (noun)	conˈtact (verb)
	ˈperfect (adj.)	perˈfect (verb)
	ˈconvert (noun)	conˈvert (verb)

In some derivationally related word pairs, only a feature of the final consonant changes, usually its voicing:

(4)	advice	advise	/s/ → /z/
	belief	believe	/f/ → /v/
	mouth	mouthe	/θ/ → /ð/
	breath	breathe	/θ/ → /ð/

In some cases adding a derivational morpheme induces a change in a stressed vowel:

(5)	divine	divinity	/aɪ/ → /ɪ/
	profane	profanity	/e/ → /æ/
	serene	serenity	/i/ → /ɛ/

In other cases, the addition of a suffix triggers a change in the final consonant of the root. For example, an alveolar consonant becomes palatal with the same voicing value:

(6)	part	partial	/t/ → /ʃ/
	face	facial	/s/ → /ʃ/

seize	seizure	/z/ → /ʒ/
remit	remission	/t/ → /ʃ/

In a multi-syllabic word with a stressed tense vowel, the palatalization may be accompanied by a laxing of that vowel:

(7)	collide	collision	/d/ → /ʒ/	/aɪ/ → /ɪ/
	elide	elision	/d/ → /ʒ/	/aɪ/ → /ɪ/

Sometimes the addition of a derivational affix requires a change in the stress pattern, with consequential changes in the pronunciations of the vowels. In most cases an unstressed vowel is pronounced as schwa:

(8)	ˈtelegraph	teˈlegraphy
	ˈregal	reˈgalia
	ˈtutor	tuˈtorial

In still other cases we find suffixing, stress migration with change of vowel quality, and change of consonant:

(9)	apˈprove	appro'bation	/u/ → /ə/	/v/ → /b/

Additionally, English allows us to change a word's part of speech without any change of form. As a result, identical forms may belong to different parts of speech, e.g., *saw* the noun and *saw* the verb:

(10) a. This saw is too dull. (noun)
b. Don't saw that board. (verb)

Other examples include *hit*, *buy*, *dust*, *autograph*, *brown-bag*, which can all be both verbs and nouns. Change of part of speech without any corresponding formal change is called **conversion** (also **functional shift** or **zero derivation**). There is more on this topic in our chapter on Major Parts of Speech.

Exercise

1. Write each of the example words in (3)-(9) in a phonemic notation.

2. True or False?
   a. Every English word contains at least one root.
   b. In English, derivational morphemes occur before inflectional morphemes.
   c. In English, derivational suffixes regularly occur before inflectional suffixes.
   d. In English, a few inflectional morphemes can occur as prefixes.
   e. Every root in English is a free morpheme (i.e., there is no such thing as a bound root.) (Hint: consider *receive, deceive, conceive, perceive*.)
   f. In English, some morphemes have both a free and a bound allomorph. (Hint: consider *able, ability; France, Franco-*.)

3. a. In a broad phonetic (phonemic) transcription, transcribe the sounds represented by the bolded letters in ***im****possible,* ***in****edible,* ***il****legible,* ***ir****responsible*.
   b. What meaning do these pairs of letters have in common?
   c. What is the first sound in all four pairs of sounds?
   d. What are the second sounds in the pairs of sounds?
   e. Why does the second sound vary as it does?
   f. How would you analyze this variation in terms of morphemes and allomorphs?

4. As English readily allows conversion, you should have no trouble compiling a list of ten pairs of words with identical forms but different parts of speech. For each pair of words, create a pair of short sentences that show that the words do belong to different parts of speech.

As we'll see in more detail in the next chapter, words belonging to different parts of speech take different inflections—e.g., $\{_{N}$saw$\}$ + $\{_{pl}$-s$\}$; $\{_{V}$saw$\}$ + {-ed}. Because derivationally related forms often belong to different parts of speech and consequently allow different inflections, and because the meanings of derivationally related pairs are not always as parallel as their forms are, derived forms may be given their own entries in dictionaries. Webster's New World Dictionary, for instance, has separate entries for *generate* and *generation* and for *compete* and *competence*. Look up these words in your own dictionary and note how the meanings of *generation* and *competence* are not entirely predictable from those of *generate* + {-ion} and *compete* + {-ence},

respectively.

The term **word family** is often used for a set of words that are related to each other derivationally or inflectionally, though the term is also used to refer to any set of words that rhyme with each other.

Compounding

The italicized words in (11) are created by combining *saw* with some other word, rather than with a bound morpheme.

(11) a. A *sawmill* is a noisy place.
b. Every workshop should have a *chain saw*, a *table saw,* a *jig-saw*, a *hack saw*, and a *bucksaw.*
c. *Sawdust* is always a problem in a woodworker's workshop.
d. *Sawing horses* are useful and easily made.

Such words are called **compounds**. They contain two or more words (or more accurately, two or more roots, all, one, or none of which may be bound; cf. *blueberry* with two free morphemes, and *astronaut* with two bound morphemes). Generally, one of the words is the head of the compound and the other(s) its modifier(s). In *bucksaw*, *saw* is the head, which is modified by *buck*. The order is significant: compare *pack rat* with *rat pack*. Generally, the modifier comes before the head.

In ordinary English spelling, compounds are sometimes spelled as single words, as in *sawmill*, *sawdust*; sometimes the parts are connected by a hyphen, as in *jig-saw*; and sometimes they are spelled as two words, as in *chain saw*, *oil well*. (Dictionaries may differ in their spellings.) Nonetheless, we are justified in classifying all such cases as compound words regardless of their conventional spelling for a variety of reasons.

First, the stress pattern of the compound word is usually different from the stress pattern in the phrase composed of the same words in the same order. Compare:

(12)

COMPOUND	PHRASE
ˈWhite House	white ˈhouse
ˈfunny farm	funny ˈfarm
ˈblackbird	black ˈbird
ˈflatcar	flat ˈcar

Exercise

Very bad teenager joke:
Q: How do you make a cat drink?
A: Put it in a blender.
What are the verbal tricks here?

In the compounds the main stress is on the first word; in the phrases the main stress is on the last word. While this pattern does not apply to all compounds, it is so generally true that it provides a very useful test.

Second, the meaning of the compound may differ to a greater or lesser degree from that of the corresponding phrase. A *blackbird* is a species of bird, regardless of its color; a *black bird* is a bird which is black, regardless of its species. A *trotting-horse* is a kind of horse, regardless of its current activity; *a trotting horse* must be a horse that is currently trotting. So, because the meanings of compounds are not always predictable from the meanings of their constituents, dictionaries often provide individual entries for them. They do not do this for phrases, unless the meaning of the phrase is **idiomatic** and therefore not derivable from the meanings of its parts and how they are put together, e.g., *raining cats and dogs*. Generally the meaning of a phrase is predictable from the meanings of its constituents, and so phrases need not be listed individually. (Indeed, because the number of possible phrases in a language is infinite, it is in principle impossible to list them all.)

Third, in many compounds, the order of the constituent words is different from that in the corresponding phrase:

(13)

COMPOUND	PHRASE
sawmill	mill for sawing
sawing horse	horse for sawing
sawdust	dust from sawing

Fourth, compound nouns allow no modification to the first element. This contrasts with noun phrases, which do allow modification to the modifier: compare **a really-blackbird* and *a really black bird*.

There are a number of ways of approaching the study and classification of compound words, the most accessible of which is to classify them according to the part of speech of the compound and then sub-classify them according to the parts of speech of its constituents. Table 2 is based on discussion in Bauer (1983).

1. Compound nouns
   a. Noun + noun: bath towel; boy-friend; death blow
   b. Verb + noun: pickpocket; breakfast
   c. Noun +verb: nosebleed; sunshine
   d. Verb +verb: make-believe
   e. Adjective + noun: deep structure; fast-food
   f. Particle + noun: in-crowd; down-town
   g. Adverb + noun: now generation
   h. Verb + particle: cop-out; drop-out
   i. Phrase compounds: son-in-law
2. Compound verbs
   a. Noun + verb: sky-dive
   b. Adjective + verb: fine-tune
   c. Particle + verb: overbook
   d. Adjective + noun: brown-bag
3. Compound adjectives
   a. Noun + adjective: card-carrying; childproof
   b. Verb + adjective: fail safe
   c. Adjective + adjective: open-ended
   d. Adverb + adjective: cross-modal
   e. Particle + adjective: over-qualified
   f. Noun + noun: coffee-table
   g. Verb + noun: roll-neck
   h. Adjective + noun: red-brick; blue-collar
   i. Particle + noun: in-depth
   j. Verb + verb: go-go; make-believe
   k. Adjective/Adverb + verb: high-rise;
   l. Verb + particle: see-through; tow-away
4. Compound adverbs
   uptightly
   cross-modally
5. Neo-classical compounds
   astro-naut
   hydro-electric
   mechano-phobe

TABLE 2: ENGLISH COMPOUNDS (BAUER, 1983)

An alternative approach is to classify compounds in terms of the semantic relationship between the compound and its head. The head of a com-

pound is the constituent modified by the compound's other constituents. In English, heads of compounds are typically the rightmost constituent (excluding any derivational and inflectional suffixes). For example, in *traffic-cop* the head is *cop,* which is modified by *traffic;* in *line-backer* the head is *backer,* which is modified by *line.* Linguists distinguish at least three different semantic relations between the head and modifier(s) of compounds.

First, the compound represents a subtype of whatever the head represents. For instance, a *traffic-cop* is a kind of cop; a *teapot* is a kind of pot; a *fog-lamp* is a kind of lamp; a *blue-jay* is a kind of jay. That is, the head names the type, and the compound names the subtype. These are called **endocentric compounds**.

Second, the compound names a subtype, but the type is not represented by either the head or the modifier in the compound. For example, *Deadhead, redhead,* and *pickpocket* represent types of people by denoting some distinguishing characteristic. There is typically another word, not included in the compound, that represents the type of which the compound represents the subtype. In the case of *Deadhead, redhead,* and *pickpocket* this other word is *person,* so a *Deadhead* is a person who is an enthusiastic fan of the band *The Grateful Dead.* These are called **exocentric compounds**.

Third, there are compounds in which both elements are heads; each contributes equally to the meaning of the whole and neither is subordinate to the other, for instance, *bitter-sweet.* Compounds like these can be paraphrased as both X and Y, e.g., "bitter and sweet." Other examples include *teacher-researcher* and *producer-director.* These can be called **coordinative compounds**.

Exercise

For each set of words below, say whether the words are endocentric, exocentric, or coordinative compounds. Justify your identification.

a. redneck, yellowjacket, cocktail, blackhead
b. armchair, breathtest, rockopera
c. secretary-treasurer, scholar-administrator

As a third (and final) possible mode of analyzing compounds we briefly consider that used in the series of modern traditional grammars prepared by Quirk, Greenbaum, Leech and Svartvik (1972, 1985). In this method, the compounds are analyzed and classified according to the relationships among their constituents when the meaning of the compound is expressed

as a phrase or clause. For example:

PHRASES	
bee-sting	a sting by a bee
blood-test	a test of blood
swimming pool	a pool for swimming
adding machine	a machine for adding
girlfriend	a friend who is a girl
killer shark	a shark which is a killer
windmill	a mill powered by wind
motorcycle	a cycle powered by a motor
self-control	someone able to control self
CLAUSES	
sunrise	when the sun rises

TABLE 3: UNDERLYING SYNTACTIC/SEMANTIC ANALYSIS OF ENGLISH COMPOUNDS

Exercise

Paraphrase each of the following compounds according to at least one of the patterns in Table 3.

babysitter, catfish, cry-baby, story-teller, dancing girl, darkroom, doorknob, taxpayer, security officer, sleepwalking

Other sources of words

Besides derivation and compounding, languages make use of coining, abbreviating, blending, and borrowing to create new words.

Coining is the creation of new words without reference to the existing morphological resources of the language, that is, solely out of the sounds of the language. Coining is very rare, but *googol* [note the spelling] is an attested example, meaning 10^{100}. This word was invented in 1940 by the nine-year-old nephew of a mathematician (see Compact Edition of the Oxford English Dictionary Vol. III Supplement to the OED Vols. I-IV: 1987 p. 317).

Abbreviation involves the shortening of existing words to create other words, usually informal versions of the originals. There are several ways to abbreviate. We may simply lop off one or more syllables, as in *prof* for *professor, doc* for *doctor.* Usually the syllable left over provides enough information

to allow us to identify the word it's an abbreviation of, though occasionally this is not the case: United Airlines's low cost carrier is called *Ted.* (Go figure!) Alternatively, we may use the first letter of each word in a phrase to create a new expression, an **acronym**, as in UN, US, or SUV. In these instances the acronym is pronounced as a sequence of letter names. In other instances, such as *UNICEF* from *United Nations International Children's Emergency Fund,* the acronym can be pronounced as an ordinary English word. Advertisers make prolific use of acronyms and often try to make them pronounceable as ordinary words.

Blending involves taking two or more words, removing parts of each, and joining the residues together to create a new word whose form and meaning are taken from the source words. *Smog* derives from *smoke* and *fog* and means a combination of these two substances (and probably lots of others); *motel* derives from *motor* and *hotel* and refers to hotels that are convenient in various ways to motorists; *Prevacid* derives from *prevent acid*; *eracism* derives from *erase* and *racism* and means erase racism or, if read against the grain, electronic racism (cf. *email, ecommerce, E-trade*); *webinar* derives from *(worldwide) web* and *seminar*. In November 2007, an interviewee on an NPR news item created the blend *snolo* to refer to playing bike polo in the snow.

Borrowing involves copying a word that originally belonged in one language into another language. For instance, many terms from Mexican cuisine, like *taco* and *burrito,* have become current in American English and are spreading to other English dialects. Borrowing requires that the borrowing language and the source language come in contact with each other. Speakers of the borrowing language must learn at least some minimum of the source language for the borrowing to take place. Over its 1500 year history English has borrowed from hundreds of languages, though the main ones are Latin (*homicide*), Greek (*chorus*), French (*mutton*), Italian (*aria*), Spanish (*ranch*), German (*semester*), and the Scandinavian languages (*law*). From Native American languages, American English has borrowed place names (*Chicago*), river names (*Mississippi*), animal names (*opossum*), and plant names (*hickory*).

The borrowed word never remains a perfect copy of its original. It is made to fit the phonological, morphological, and syntactic patterns of its new language. For example, the Spanish pronunciation of *burritos* is very different from the English pronunciation. At the very least, the two languages use different /r/s and /t/s, and the plural marker {-s} is voiced in English but voiceless in Spanish.

See our chapter on the History of the English Language in Book II for

more on borrowing.

REGISTERS AND WORDS

Although most of the words we use every day can be used in almost any context, many words of the language are restricted to uses in certain fields, disciplines, professions, or activities, i.e., **registers**. For example, the word *phoneme* is restricted to the linguistic domain. Interestingly, some words may be used in several domains with a different meaning in each, though these meanings may be a specific version of a more general meaning. For example, the word *morphology* is used in linguistics to refer to the study of the internal structure of words and their derivational relationships; in botany to refer to the forms of plants; in geology to refer to rock formations. The general, abstract meaning underlying these specific meanings is the study of form.

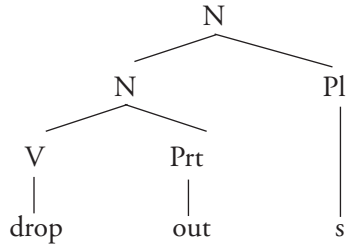
Besides words that may be used in almost any context and those that are technical or discipline specific, there are words that play important roles in academic discourses generally, for example, *accuracy; basis; concept* and its related forms, *conception, conceptual, conceptualize; decrease; effect; factor; indicate* and its related forms, *indication, indicative;* and *result*. As such words are used across disciplines, generally without local idiosyncrasies of meaning, they are important words for English learners, both native and non-native speakers. For a useful overview of the attempts to create lists of such **academic** (or **subtechnical**) **words** and a new list of them, see Coxhead (2000) and the references therein (another academic word).

THE INTERNAL STRUCTURE OF COMPLEX WORDS

Complex words (those composed of more than one morpheme) are not merely unstructured sequences of morphemes. For example, the plural {-s} suffix on *dropouts* must be added to the entire compound *dropout*, not to *out* to which *drop* is then added. The reason for this is that the plural suffix may be attached to nouns, but not to verbs or particles. *Drop* and *out* constitute a noun only after they have been brought together in the compound.

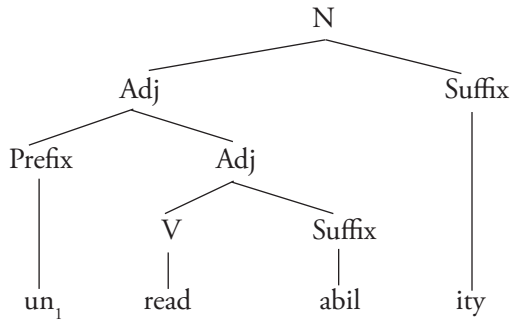
We can use brackets with subscripts to represent these relations: $[_N[_N[_V\text{drop}][_{Prt}\text{out}]]\text{s}]$. Alternatively, and equivalently, we can use tree diagrams to indicate the parts (constituents) of complex words and their structural relations:

(14)



Consider another example: *unreadability*. We analyze this word as $[_{N}[_{Adj}un_{1}[_{Adj}[_{V}$read]abil]]ity], represented by the following tree:

(15)



Let's consider this analysis more closely. The suffix {-able} attaches to verbs to create adjectives. Besides *readable* we have the adjectives *doable*, *manageable*, and *attachable*, which are derived from the verbs *read*, *do*, *manage*, and *attach*, respectively. We can represent this part of the word as: $[_{Adj}[_{V}$read] able].

The prefix {un_1-} attaches to adjectives, meaning "not" or "the converse of." Compare *unwise*, *unfair*, *ungrateful*, *uncomfortable*, *unmanageable* with *unreadable*. All can be glossed as not having the quality denoted by the adjective to which they are attached: "not comfortable," "not fair," etc. This morpheme must be distinguished from the prefix {un_2-} meaning "to reverse the action," which can be attached only to verbs (e.g., *untie*).

{Un_1-} cannot attach to the verb *read*; although there is the word *unread*, pronounced [ənrɛd], not [ənrid], an adjective meaning "not read" and derived from the past participle of *read*. Consequently, in *unreadable*, {-able} must be attached to {read} to create the adjective *readable*. {Un_1-} may then be attached to *readable* to create *unreadable*. We will represent this part of the word as: $[_{Adj}un_{1}[_{Adj}[_{V}$read]able]].

The suffix {-ity} attaches to adjectives to create abstract nouns. Consequently it must be attached to the adjective *unreadable*. The structure of

the entire word therefore must be: $[_{N}[_{Adj}un_{1}[_{Adj}[_{V}read]able]]ity]$, as specified above. In pronunciation the morpheme {-able} will be assigned its allomorph /əbɪl/ (spelled <abil>, the same allomorph that appears in *ability*).

Exercise

Provide an analysis tree for each of the following words: *retry, sinkable, thoughtless, meaningfulness, microorganisms*.

CLASSIFYING WORDS BY THEIR MORPHOLOGICAL PROPERTIES

Once the morphemes of a language have been identified, their allomorphs determined, and their distributions specified, we can use our analysis to assign the words of a language to parts of speech. For many words, inflections provide the main basis of this assignment. Refer to Table 1 for the list of English inflections.

Nouns can be identified as those words that can be inflected for plural.

Verbs are words that can be inflected for 3rd person singular present tense, past tense, past participle, and progressive. These forms are often referred to as the principal parts of the verb.

Short adjectives and adverbs are words that can be inflected for comparative and superlative.

Derivational regularities can also be used to classify words. We can, for example, classify as adverbs words derived from adjectives by the addition of the suffix {-ly}, e.g., *quickly*.

Classifying words on the basis of their internal morphological structure works only up to a point. There are lots of words that are not internally complex and so cannot be classified without recourse to other types of criteria. For example, the preposition *to* has no internal morphological structure and so cannot be assigned to a grammatical class on that basis. Likewise, adverbs such as *hard* or *fast* lack the characteristic {-ly} ending. It becomes necessary to use other criteria to classify these and many other words. We consider in detail the principles which have been proposed for assigning words to parts of speech in the chapters on Major and Minor Parts of Speech in this book.

Exercise

1. Discuss two relatively reliable criteria (don't use spelling) for distinguishing words from morphemes and phrases. Illustrate your discussion

with appropriate examples.

2. Derivation displays a range of patterns in English. Discuss three different derivational patterns, illustrating your description with appropriate examples.

REFERENCES AND RESOURCES

Beers, Kylene. 2003. *When Kids can't Read*. Portsmouth, NH: Heinemann.

Bauer, Laurie. 1983. *English Word-formation*. London, UK: Cambridge University Press.

_____ 1988. *Introducing Linguistic Morphology*. Edinburgh, UK: Edinburgh University Press.

Booij, Geert. 2005. *The Grammar of Words*. Oxford, UK: Oxford University Press.

Coxhead, Averil. 2000. A new academic word list. *TESOL Quarterly* 34, 2: 213-238.

Haspelmath, Martin. 2002. *Understanding Morphology*. London: Arnold.

Huddleston, Rodney and Geoffrey K. Pullum. 2002. *The Cambridge Grammar of the English Language*. Cambridge, UK: Cambridge University Press.

Matthews, P.H. 1974. *Morphology: An Introduction to the Theory of Word Structure*. Cambridge, UK: Cambridge University Press.

Pinker, Steven, 1999. *Words and Rules: The Ingredients of Language*. New York: Basic Books.

Quirk, R., S. Greenbaum, G. Leech, and J. Svartvik. 1972. *A Grammar of Contemporary English*. New York: Seminar Press.

_____ 1985. *Comprehensive Grammar of the English Language*. London, UK: Longman.

Spencer, A. 1991. *Morphological Theory: An Introduction to Word Structure in Generative Grammar*. Oxford, UK: Blackwell.

GLOSSARY

AFFIX: an inflectional or derivational morpheme; to attach an inflectional or derivational morpheme to an expression.

ALLOMORPH: variant phonological representation of a morpheme.

AUXILIARY VERB: a verb other than the main verb of a clause.

BASE: part of word to which an affix may be attached; may but need not be a **root** morpheme.

BOUND MORPHEME: a morpheme that must be attached to another morpheme.

CONSTITUENT: a unified part of a construction (e.g., of a word, phrase, or sentence).
CONVERSION: derivational relationship between two words of different parts of speech but without any formal marking of the difference.
COORDINATIVE COMPOUND: a compound word that denotes an entity or property to which both constituents contribute equally; e.g., *bittersweet* refers to a quality which is both bitter and sweet.
DERIVATION: process of changing a word from one part of speech to another or from one subclass to another, typically by making some change in form.
ENDOCENTRIC COMPOUND: a compound word that denotes a subtype of whatever is denoted by the head. *Armchair* represents a type of chair; *breath-test* represents a kind of test.
EXOCENTRIC COMPOUND: a compound word that denotes a subtype of a category that is not mentioned within the compound; e.g., *pickpocket* represents a kind of person, not a kind of pocket nor a kind of pick.
FREE MORPHEME: a morpheme that need not be attached to another morpheme, but can constitute a word on its own.
HEAD: the main constituent of a compound, which may be modified by the compound's other constituents.
INFLECTIONAL MORPHEME: a bound morpheme that signals a grammatical function and meaning in a specific sentence, e.g., plural {-s}, past tense {-ed}, comparative {-er}, superlative {-est}.
MORPH: a minimal meaningful form, regardless of whether it is a morpheme or allomorph.
MORPHEME: the smallest part of a word that has meaning or grammatical function.
PREFIX: a bound morpheme attached before a root.
REALIZATION: the representation of one or more abstract elements (e.g., morphemes) by concrete elements (e.g., sounds); e.g., *women* represents the morphemes {woman} + {PLURAL}.
ROOT: the basic constituent of a word, to which other morphemes are attached.
SUFFIX: a bound morpheme attached after a root.
SUPPLETION: irregular inflectional forms of a word resulting from the combination of historically different sources; e.g., *go/went.*

APPENDIX A: SOME ENGLISH DERIVATIONAL MORPHEMES

(See Beers 2003: Appendixes D and E for other lists of roots and derivational affixes.)

Prefixes

Class/category changing

a-blaze	Adj < V
be-calm	V < Adj
be-friend	V < N
en-tomb	V < N

Class maintaining

Nouns
- arch-monetarist
- mal-nutrition
- micro-dot
- mini-dress
- step-father

Verbs
- de-escalate

Adjectives
- a-typical
- cis-lunar
- extra-sensory

Noun or Verb
- fore-ground
- bacl-ground
- mis-fortune
- mis-lead
- re-arrangement

Noun or Adjective
- ex-President
- ex-orbital
- in-definite
- mid-morning
- mid-Victorian

Verb or Adjective

circum-navigate
circum-polar

Noun, Verb, or Adjective
co-author
counter-culture
counter-demonstrate
counter-intuitive
dis-ambiguate
dis-bound
dis-information
inter-mix
sub-conscious
sub-let

Suffixes

Creating Nouns

from Nouns

-dom	king-dom
-er	Birch-er
-ess	lion-ess
-ette	kitchen-ette
-iana	Victor-iana
-hood	man-hood
-ism	absentee-ism
-let	stream-let
-ling	duck-ling
-scape	sea-scape
-ship	kin-ship

from Verbs

-al	arriv-al
-ary	dispens-ary
-ation (esp. with -ize)	categor-iz-ation
-ee	blackmail-ee
-er	kill-er
-ment	manage-ment
-ure	clos-ure

from Adjectives

-ce	dependen-ce
-cy	excellen-cy
-dom	free-dom
-er	six-er
-hood	false-hood
-ist	social-ist
-ity	divin-ity
-ness	good-ness
-th	warm-th

Derived Verbs

from Nouns

-fy	metr-ify
-ize	Cambodian-ize

from Adjectives

-en	short-en

Derived Adjectives

from Nouns

-al	education-al (allomorphs/allographs: -ial, -ual: presidential, habitual)
-ate	passion-ate
-en	wood-en
-ese	Peking-ese
-esque	pictur-esque
-ful	doubt-ful
-ic	algebra-ic
-less	clue-less
-ly	friend-ly
-ous	venom-ous
-y	catt-y

from Verbs

-able	unbeliev-able
-less	count-less

-ant/-ent	absorb-ent
-atory	affirm-atory
-ful	resent-ful
-ive	generat-ive

from Adjectives

-ish	green-ish
-ly	good-ly

Derived Adverbs

-ly	slow-ly
-ward(s)	in-ward(s)
-wise	length-wise

Miscellaneous

down-er
iff-y, upp-itty
in-ness, much-ness, such-ness,
there-ness, why-ness
thus-ly