processes must be ordered.] In the data provided, ´ indicates a high tone; ` a low tone; ˆ a falling (high-to-low) tone; and ˇ a rising low-to-high tone. Vowels with no tone mark need not be considered.

a)	màá we	→	[mă]	'we'
b)	ká ùmu he runs	→	[kûmu]	'he runs'
c)	ká ɔ̀ŋga he jumps	→	[kɔ̂ŋga]	'he jumps'
d)	njá àdì ùzi ja you call who?	→	[njâdùzi ja]	'who are you calling?'

four

MORPHOLOGY: THE ANALYSIS OF WORD STRUCTURE

William O'Grady
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Carve every word before you let it fall.

– OLIVER WENDELL HOLMES, SR.

Part of linguistic competence involves the ability to construct and interpret words in one's native language. The average high school student knows about 60 000 words whose form and meaning are not derived from those of other words. Such words—including *read*, *language*, *on*, *cold*, and *if*, to name but a few—must be learned and stored as separate items in the **lexicon** (or mental dictionary). However, countless other words can be constructed and comprehended by the application of quite general rules to more basic words. For example, any speaker of English who knows the verb *fax* recognizes *faxed* as its past tense form, and can construct and interpret words such as *faxable* (for things that can be faxed) and *fax machine* (for the device that sends and receives faxes).

The system of categories and rules involved in word formation and interpretation makes up a language's **morphology**. This chapter presents an introduction to the study of morphology, beginning with the inventory of notions relevant to the analysis of word structure.

1 WORDS AND WORD STRUCTURE

Of all the units of linguistic analysis, the **word** is the most familiar. As literate speakers of English, we rarely have difficulty segmenting a stream of speech sounds into words or deciding where to leave spaces when writing a sentence. It is not easy, however, to define precisely what a word is.

The most reliable defining property of words is that they are the smallest **free forms** found in language. A free form is an element that can occur in isolation

and/or whose position with respect to neighbouring categories is not completely fixed. Consider in this regard the elements making up the following sentence.

1)

The birds left.

The plural marker *-s* is not a free form (and therefore not a word) since it never occurs in isolation and cannot be separated from the noun to which it belongs. (Elements that must be attached to another category are written here with a hyphen.)

2)

*The bird left -s.

In contrast, *birds* is a word since it can occur in isolation, as in the following exchange.

3)

Speaker A: What are those things in the tree?
Speaker B: Birds.

Moreover, even when *birds* occurs as part of a larger sentence, it is not attached to anything else. This is why it can appear in different positions within a sentence, as illustrated in *4)*.

4)

a. *birds* occurring in front of a verb:
Birds avoid cats.
b. *birds* occurring after a verb:
Cats chase birds.

Some words, such as *the* in sentence *1)*, do not normally occur in isolation. However, they are still free forms since their positioning with respect to neighbouring categories is not entirely fixed. Thus, as shown by the following sentence, *the* does not always have to occur immediately in front of a noun; the two can easily be separated by an intervening word.

5)

The young birds remained in the nest.

1.1 MORPHEMES

Like syllables and sentences, words have an internal structure consisting of smaller units organized with respect to each other in a particular way. The most important component of word structure is the **morpheme**, the smallest unit of language that carries information about meaning or function. The word *builder*, for example, consists of two morphemes: *build* (with the meaning of 'construct') and *-er* (which indicates that the entire word functions as a noun with the meaning 'one who builds'). Similarly, the word *houses* is made up of the morphemes *house* (with the meaning 'dwelling') and *-s* (with the meaning 'more than one').

Some words consist of a single morpheme. For example, the word *train* cannot be divided into smaller parts (say, *tr* and *ain* or *t* and *rain*) that carry information about its meaning or function. Such words are said to be **simple** and are distinguished from **complex** words, which contain two or more morphemes.

Table 4.1 Words consisting of one or more morphemes

One	*Two*	*Three*	*More than three*
and			
boy	boy-s		
hunt	hunt-er	hunt-er-s	
act	act-ive	act-iv-ate	re-act-iv-ate
man	gentle-man	gentle-man-ly	gentle-man-li-ness

Free and bound morphemes

A morpheme that can be a word by itself is called **free** whereas a morpheme that must be attached to another element is said to be **bound**. The morpheme *boy*, for example, is free since it can be used as a word on its own; plural *-s*, on the other hand, is bound.

Concepts that are expressed by free morphemes in English do not necessarily have the same status in other languages. For example, in Hare (an Athapaskan language spoken in Canada's Northwest Territories), morphemes that indicate body parts must always be attached to a morpheme designating a possessor. (The diacritic ´ marks a high tone.)

Table 4.2 Some body part names in Hare

Without a possessor		*With a possessor*	
*fí	'head'	sefí	'my head'
*bé	'belly'	nebé	'your belly'
*dzé	'heart'	ʔedzé	'someone's heart/a heart'

In English, of course, these body part names are free morphemes and do not have to be attached to another element.

Conversely, there are also some bound forms in English whose counterparts in other languages are free. For example, the notion 'past' or 'completed' is expressed by the bound morpheme *-ed* in English, but by the free morpheme *lɛɛw* in Thai. As the following sentence shows, this morpheme can even be separated from the verb by an intervening word. (Tone is not marked here.)

6)

Boon thaan khaaw lɛɛw.
Boon eat rice past
'Boon ate rice.'

Allomorphs

Morphemes do not always have an invariant form. The morpheme used to express indefiniteness in English, for instance, has two forms—*a* and *an*.

7)

an orange	a building
an accent	a car
an eel	a girl

The form *a* is used before words beginning with a consonant and the form *an* before words beginning with a vowel. The variant forms of a morpheme are called its **allomorphs**.

Another example of allomorphic variation is found in the pronunciation of the plural morpheme *-s* in the following words.

8)

cats
dogs
judges

Whereas the plural is pronounced as /s/ in the first case, it is realized as /z/ in the second, and as /əz/ in the third. Here again, selection of the proper allomorph is dependent on phonological facts. We will examine this phenomenon in more detail in chapter 6.

Other examples of patterns in which a morpheme's form changes when it combines with another element are easy to find in English. The final segment in *assert*, for instance, is realized as /t/ when this morpheme stands alone as a separate word but as /ʃ/ when it combines with the morpheme *-ion* in the word *assertion*. Comparable alternations are found in words such as *permit/permiss-ive*, *include/inclusive*, *electric/electric-ity*, *impress/impress-ion*, and so on. In all these cases, we are dealing with variant forms of a single morpheme.

Beginning students can be confused by the changes in spelling that occur in some morphological patterns even when there is no corresponding change in pronunciation. Thus, the final *e* in the words *create* and *ride* is lost when they combine with a morpheme beginning with a vowel (*creat-ive*, *rid-ing*). These spelling modifications do not change a morpheme's identity, of course, and should simply be ignored when doing morphological analysis.

1.2 Representing Word Structure

In order to represent the internal structure of words, it is necessary not only to identify each of the component morphemes but also to classify these elements in terms of their contribution to the meaning and function of the larger word.

Roots and affixes

Complex words typically consist of a **root** and one or more **affixes**. The root morpheme constitutes the core of the word and carries the major component of its meaning. Roots typically belong to a lexical category—noun (N), verb (V), adjective (A), or preposition (P). These categories will be discussed in more detail in chapter 5, section 1.1. For now it suffices to note that nouns typically refer to concrete and abstract 'things' while verbs (*treat*, *teach*) tend to denote actions, adjectives usually name properties (*kind*, *red*), and prepositions (*in*, *near*) encode spatial relations. In general, nouns can occur with *the* (*the car*), verbs with *will* (*will go*), and adjectives with *very* (*very kind*).

Unlike roots, affixes do not belong to a lexical category and are always bound morphemes. A straightforward illustration of this contrast is found in the word *teacher*, which consists of the verb root *teach* and the affix *-er*, a bound morpheme that combines with the root and gives a noun with the meaning 'one who teaches'. The internal structure of this word can be represented in diagram form as follows. (The symbol 'Af' stands for affix.)

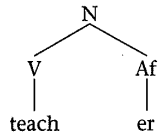


Figure 4.1 The internal structure of the word *teacher*

The internal structure of some other complex words is depicted below.

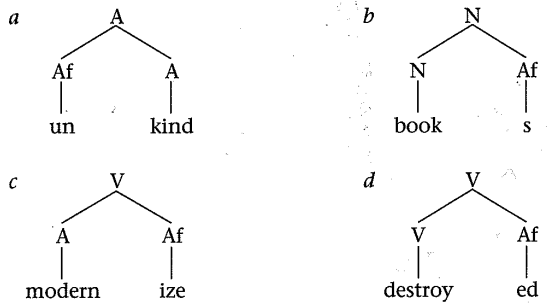


Figure 4.2 Some other words with an internal structure consisting of a root and an affix

These diagrams, which are often called **tree structures**, represent the details of a word's internal organization. Where these details are irrelevant to the point being considered, it is traditional to use a much simpler system of representation that indicates only the location of the morpheme boundaries: *un-kind*, *modern-ize*, and so on.

Bases

A **base** is the form to which an affix is added. In many cases, the base is also the root. In *books*, for example, the element to which the affix *-s* is added corresponds to the word's root. In other cases, however, an affix can be added to a unit larger than a root. This happens in words such as *blackened*, in which the past tense affix

-ed is added to the verbal base *blacken*—a unit consisting of the root morpheme *black* and the suffix *-en*.

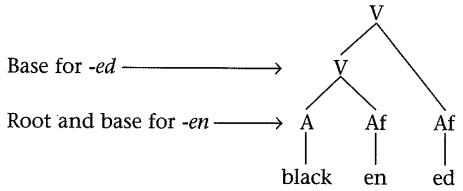


Figure 4.3 A word illustrating the difference between a root and a base

In this case, *black* is not only the root for the entire word but also the base for *-en*. The unit *blacken*, on the other hand, is simply the base for *-ed*.

Problematic cases *(Advanced)*

The majority of complex words in English are built from roots that are free morphemes. In the words *re-do* and *treat-ment*, for example, the root (*do* and *treat*, respectively) is a V that can appear elsewhere in the language without an affix. Because most complex words are formed from a root that can itself be a word, English morphology is said to be **word-based**.

This notwithstanding, English contains a significant number of words in which the root is not free. For example, the word *unkempt* seems to consist of the prefix *un-* (with the meaning 'not') and the root *kempt* (meaning 'groomed'), even though *kempt* cannot be used by itself. Other common words of this type include *horr-ify*, *venge-ance*, *in-ept*, and *salv-ation*, to name but a few. We will assign morphemes such as *kempt*, *horr*, *venge*, *ept*, and *salv* to the special category 'bound root' (B), which we will reserve for root morphemes that cannot be used as words and therefore do not belong to a conventional lexical category such as noun or verb.

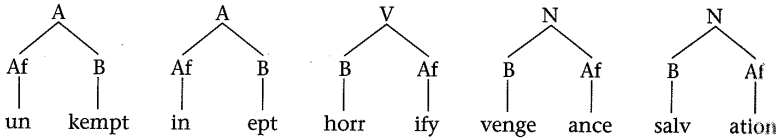


Figure 4.4 The internal structure of words built around a bound root

The origin of most bound roots can be traced to accidents of linguistic history. For example, there was once a word *kempt* in English (with the meaning 'combed') and it was to this base that the affix *un-* was originally attached. At a later point, however, *kempt* disappeared from the language, leaving behind the word *unkempt* in which an affix appears with a bound root. The remaining examples in figure 4.4 have a somewhat different history: instead of being formed from words already in the language, they were borrowed into English as whole words. For example, *ineptus* comes from Latin *ineptus* 'unsuited'; the relationship of its root to the word *apt* may have been evident at one time, but is unknown to most speakers today.

More problematic are words such as *receive*, *deceive*, *conceive*, and *perceive* or *permit*, *submit*, and *commit*. These items were borrowed as whole words into English (many of them from Latin through French). Even at the time of borrowing, the *re-* of *receive* did not have the sense of 'again' that it does in *redo* ('do again') and the *de-* of *deceive* did not express the meaning 'reverse the process' associated with the *de-* in *demystify* or *decertify*. Because the components of words like *receive* and *deceive* carry no identifiable meaning for the average speaker of English (who has no knowledge of Latin), we will not treat them as separate morphemes in this book.[1] Thus, we take the word *receive* to consist of a single morpheme.

4.3 Some common morphological phenomena

Human language makes use of a variety of operations that can modify a word's structure, either by adding some element to it or by making an internal change. This section introduces and illustrates the most common of these processes, including some that are not found in English.

Affixation

An extremely common morphological process in language is **affixation**, the addition of an affix. Normally, linguists distinguish among three types of affixes. An affix that is attached to the front of its base is called a **prefix** whereas an affix that is attached to the end of its base is termed a **suffix**. Both types of affix occur in English, as the following table shows.

Table 4.3 Some English prefixes and suffixes

Prefixes	*Suffixes*
de-activate	vivid-ly
re-play	govern-ment
il-legal	hunt-er
in-accurate	kind-ness

We will consider the nature and properties of English affixes in more detail in sections 2.1 and 5.

Far less common than prefixes and suffixes are **infixes**, a type of affix that occurs within a base. The following data from the Philippine language Tagalog contains examples of the infixes *-um-* and *-in-*, which are inserted before the first vowel of the base to mark a completed event.

Table 4.4 Some Tagalog infixes

Base		*Infixed form*	
takbuh	'run'	t-um-akbuh	'ran'
lakad	'walk'	l-um-akad	'walked'
pili?	'choose'	p-in-ili?	'chose'

Beginning students sometimes think that a morpheme such as *-ish* in *boy-ish-ness* is an infix since it occurs between two other morphemes (*boy* and *-ness*), but this is not so. To be an infix, an affix must occur inside its base (as when *-um-* in Tagalog occurs inside *takbuh* 'run'). Nothing of this sort happens in the case of *-ish*, since its base is *boy* not the impossible **boyness*.

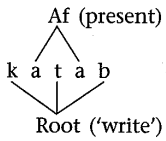
A very special type of infixing system is found in Semitic languages such as Arabic, in which a typical root consists simply of three consonants. Affixes consisting of two vowels are then inserted into this root in a manner that interspersses the vowels among the consonants. (In the examples that follow, the segments of the root are written in boldface.)

9)

katab	**kutib**	**aktub**	**uktab**
'write'	'have been written'	'be writing'	'being written'

One way to represent the structure of such words is as follows, with the root and affix assigned to different tiers, or levels of structure, that are intercalated in the actual pronunciation of the word.

10)



Cliticization

Some words are unable to stand alone as independent forms for phonological reasons. Such elements, called **clitics**, are short unstressed forms that are pronounced together with another element as if the two were a single unit. A good example of this can be found in English, where certain verb forms have reduced variants (*'m* for *am*, *'s* for *is*, and *'re* for *are*) that cannot stand alone since they no longer constitute a syllable. Cliticization occurs, attaching these elements to the preceding word.

11)

a. I'm leaving now.
b. Mary's going to succeed.
c. They're here now.

Cliticization is also common in French, which includes a set of unstressed clitic pronouns that must be attached to the verb. (Although not evident in the written language, the clitic and the verb are pronounced as if they formed a single word.)

12)

Suzanne me voit.
Suzanne me-sees
'Suzanne sees me.'

Clitics that attach to the end of a preceding word (as in the English examples) are called **enclitics**; those that attach to the beginning of a following word (as in the French example) are known as **proclitics**.

The effects of cliticization can bear a superficial resemblance to affixation since in both cases an element that cannot stand alone is attached to another form. The key difference is that—unlike affixes—clitics are members of a lexical category such as verb, noun (or pronoun), or preposition.

Internal change

Internal change is a process that substitutes one non-morphemic segment for another to mark a grammatical contrast, as illustrated in the following pairs of words.

Table 4.5 Internal change in English

sing (present)	sang (past)
sink (present)	sank (past)
drive (present)	drove (past)
foot (singular)	feet (plural)
goose (singular)	geese (plural)

Verbs such as *sing*, *sink*, and *drive* form their past tense by changing the vowel (e.g., from *i* to *a* in the first two examples). The term **ablaut** is often used for vowel alternations that mark grammatical contrasts in this way.

Ablaut can be distinguished from **umlaut**, which involves the fronting of a vowel under the influence of a front vowel in the following syllable. Historically, this is what is responsible for the use of *feet* and *geese* as the plural forms of *foot* and *goose*, respectively: the back vowel in the root (originally /o:/) was fronted in response to the front vowel in an old plural suffix (pronounced /iz/), which was subsequently lost (see chapter 8, section 2.1 for further discussion).

The internal changes just considered are not examples of infixing for two reasons. First, there is no reason to think that English has root morphemes such as **ft* (meaning 'lower extremity of the leg') or **sng* (meaning 'produce words in a musical tone'). As shown by the Tagalog examples in table 4.4, the base into which an infix is inserted must exist as a separate form. Second, there is no independent reason to think that there is a morpheme *oo* in English that means 'singular' or a morpheme *ee* that means 'plural' in the *foot/feet* example any more than there is a morpheme *i* meaning 'present' or a morpheme *a* meaning 'past' in the *sing/sang* case. Since infixes are by definition morphemes, we can conclude that these examples involve internal change (the substitution of non-morphemic segments) rather than infixing.

Suppletion

Internal change must also be distinguished from **suppletion**, a morphological process that replaces a morpheme by an entirely different morpheme in order to indicate a grammatical contrast. An example of this phenomenon in English involves the use of *went* as the past tense form of the verb *go* or *was* and *were* as the past tense forms of *be*.

Table 4.6 Suppletion in other languages

Language	*Basic form*		*Suppletive form*	
French	*avoir*	'to have'	*eu*	'had'
Spanish	*ir*	'to go'	*fue*	'(he) went'
German	*ist*	'is'	*sind*	'are'
Russian	*xoroʃo*	'good'	*lutʃʃe*	'better' ('more good')

In some cases, it is hard to distinguish between suppletion and internal change. For example, is the past tense of *think* (*thought*) and *seek* (*sought*) an instance of suppletion or internal change? Because the initial phoneme of these verbs remains unchanged and because the phenomenon shows up in several words (see also *catch/caught* and *wreak/wrought*), we will consider this type of alternation to involve an extreme form of internal change rather than true suppletion. (However, the term **partial suppletion** is used by some linguists for these cases.)

Stress and tone placement

Sometimes, a base can undergo a change in the placement of stress or tone to reflect a change in its category. In English, for example, there are pairs of words such as those in table 4.7 in which the verb has stress on the final syllable while the corresponding noun is stressed on the first syllable. (Stress is represented here by ´.)

Table 4.7 Stress placement in English

Verb	*Noun*
implánt	ímplant
impórt	ímport
presént	présent
subjéct	súbject
contést	cóntest

In the language Mono-Bili (spoken in the African country of Zaire), tone is used to make the distinction between past and future tense. (A high tone is marked by ´ and a low tone by `.)

Table 4.8 Past versus future in Mono-Bili

Past		*Future*	
dá	'spanked'	dà	'will spank'
zɨ́	'ate'	zɨ̀	'will eat'
wó	'killed'	wò	'will kill'

As can easily be observed here, high tone is associated with the past tense and low tone with the future. (The use of tone to mark tense contrasts was also exemplified in chapter 2; see figure 2.14.)

Reduplication

Yet another common morphological process in certain languages (but not English) is **reduplication**, which duplicates all or part of the base to which it applies to mark a grammatical or semantic contrast. **Full reduplication** is the repetition of the entire word, as in the following data from Turkish and Indonesian, respectively.

Table 4.9 Some examples of full reduplication

Base		*Reduplicated form*	
Turkish			
tʃabuk	'quickly'	tʃabuk tʃabuk	'very quickly'
javaʃ	'slowly'	javaʃ javaʃ	'very slowly'
iji	'well'	iji iji	'very well'
gyzel	'beautifully'	gyzel gyzel	'very beautifully'
Indonesian			
oraŋ	'man'	oraŋ oraŋ	'all sorts of men'
anak	'child'	anak anak	'all sorts of children'
maŋga	'mango'	maŋga maŋga	'all sorts of mangoes'

In contrast, **partial reduplication** copies only part of the word. In the following data from Tagalog, for instance, reduplication affects only the first consonant-vowel sequence of the base.

Table 4.10 Reduplication in Tagalog

Base		*Reduplicated form*	
takbuh	'run'	tatakbuh	'will run'
lakad	'walk'	lalakad	'will walk'
pili?	'choose'	pipili?	'will choose'

Compounding

A final important morphological process to be considered here involves **compounding**, the combination of lexical categories (nouns, adjectives, verbs, or prepositions) to create a larger word. English includes countless compounds such as the following.

Table 4.11 Some examples of English compounds

Noun + Noun	*Adjective + Noun*	*Verb + Noun*	*Preposition + Noun*
streetlight	bluebird	swearword	overlord
campsite	happy hour	washcloth	outhouse
bookcase	high chair	scrub lady	in-group

As these examples show, the elements making up a compound can all typically occur as independent words elsewhere in the language.

Of the morphological operations just outlined, two deserve special attention because of the crucial role they play in the formation of new words in English and many other languages—derivation (a type of affixation) and compounding. We will consider these two processes in the next sections of this chapter.

2 DERIVATION

Derivation forms a word with a meaning and/or category distinct from that of its base through the addition of an affix. Table 4.12 contains words formed by adding the suffix *-er* to a verb to form a noun with the meaning 'one who does X'. (Do not confuse this suffix with the *-er* that applies to an N in cases such as *Quebecer* and *islander* or the *-er* that combines with an A in cases such as *taller* and *smarter*.)

Table 4.12 The *-er* affix

Verb base	*Resulting noun*
sell	sell-er
write	writ-er
teach	teach-er
sing	sing-er
discover	discover-er

Once formed, derived words become independent lexical items that receive their own entry in a speaker's mental dictionary. As time goes by, they often take on a special sense that is not predictable from the component morphemes: *writer* usually refers to someone who writes for a living, *comparable* (with stress on the first syllable) means 'similar' rather than 'able to be compared', *profession* usually denotes a career rather than the act of professing, and so on. The remainder of this section focuses on the role of derivation in English word formation.

2.1 ENGLISH DERIVATIONAL AFFIXES

Table 4.13 lists some English derivational affixes, along with information about the category of their base (ignoring bound roots) and of the resulting new word. The first entry states that the affix *-able* applies to a verb base and converts it into an adjective. Thus, if we add the affix *-able* to the verb *fix*, we get an adjective (with the meaning 'able to be fixed').

Sometimes beginning students have trouble determining the category of the base to which an affix is added. In the case of *worker*, for instance, the base (*work*) is sometimes used as a verb (as in *they work hard*) and sometimes as a noun (as in *the work is time-consuming*). Which category serves as base for the suffix *-er* in the word *worker*? The solution to this problem is to consider the use of *-er* (in the sense of 'one who x's') with bases whose category can be unequivocally determined. In the words

Table 4.13 Some English derivational affixes

Affix	*Change*	*Examples*
Suffixes:		
-able	V → A	fix-able, do-able, understand-able
-ant	V → N	claim-ant, defend-ant
-(at)ion	V → N	realiz-ation, assert-ion, protect-ion
-er	V → N	teach-er, work-er
-ing$_1$	V → N	the shoot-ing, the danc-ing
-ing$_2$	V → A	the sleep-ing giant, a blaz-ing fire
-ive	V → A	assert-ive, impress-ive, restrict-ive
-ment	V → N	adjourn-ment, treat-ment, amaze-ment
-ful	N → A	faith-ful, hope-ful, dread-ful
-(i)al	N → A	president-ial, nation-al
-(i)an	N → A	Arab-ian, Einstein-ian, Albert-an
-ic	N → A	cub-ic, optimist-ic, moron-ic
-ize$_1$	N → V	hospital-ize, crystal-ize
-less	N → A	penni-less, brain-less
-ous	N → A	poison-ous, lecher-ous
-ate	A → V	activ-ate, captiv-ate
-en	A → V	dead-en, black-en, hard-en
-ity	A → N	stupid-ity, prior-ity
-ize$_2$	A → V	modern-ize, national-ize
-ly	A → Adv	quiet-ly, slow-ly, careful-ly
-ness	A → N	happi-ness, sad-ness
Prefixes:		
anti-	N → N	anti-abortion, anti-pollution
de-	V → V	de-activate, de-mystify
dis-	V → V	dis-continue, dis-obey
ex-	N → N	ex-president, ex-wife, ex-friend
in-	A → A	in-competent, in-complete
mis-	V → V	mis-identify, mis-place
re-	V → V	re-think, re-do, re-state
un$_1$*-*	A → A	un-happy, un-fair, un-intelligent
un$_2$*-*	V → V	un-tie, un-lock, un-do

teacher and *writer*, for instance, we see this affix used with bases that are unequivocally verbs (*teach* and *write*). Moreover, we know that *-er* can combine with the verb *sell* (*seller*) but not the noun *sale* (**saler*). These facts allow us to conclude that the base with which *-er* combines in the word *worker* must be a verb rather than a noun.

2.2 DERIVATION AT WORK

The information contained in table 4.13 allows us to build word structures such as the following.

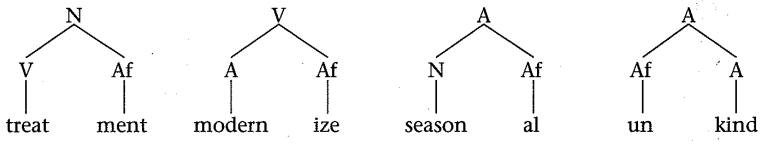


Figure 4.5 Some words formed by derivation

In each of these structures, an affix combines with a base of a particular type to give a new word, in accordance with the properties listed in table 4.13. In the case of *treatment*, for instance, the affix *-ment* combines with the V *treat* to give the N *treatment*.

These examples illustrate an important property of English complex words: the rightmost morpheme is generally the one that determines the category of the entire word. Thus, the word *unkind* is an adjective because *kind* (the rightmost morpheme) is an adjective. In contrast, the word *treatment* is a noun since the rightmost element is the affix *-ment*, which combines with a V to give an N (see table 4.13).[2]

In some languages the morpheme that determines the category of the entire word can appear on the left rather than the right. In the Philippine language Tagalog, for example, the prefix *ma-* combines with a noun base to form an adjective.

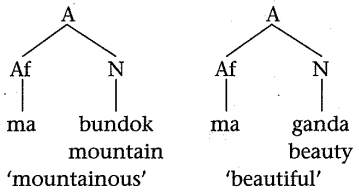


Figure 4.6 Tagalog words with a category-changing prefix

In these examples, it is the prefix—the morpheme to the left—that determines that the entire word will be an adjective.

Complex derivations

Since derivation can apply more than once, it is possible to create multiple levels of word structure, as in the following example.

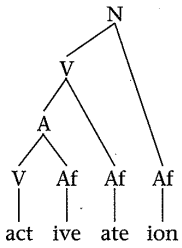


Figure 4.7 A word with a multilayered internal structure

The word *activation* contains several layers, each of which reflects the attachment of an affix to a base of the appropriate type. In the first layer, the affix *-ive* combines with the V base *act* to give an A. (As noted in table 4.13, *-ive* is the type of affix that converts a V into an A.) In the next layer, the affix *-ate* combines with this A and converts it into a V (*activate*). At this point, the affix *-ion* is added, converting the V into an N and giving the word *activation*.

In some cases, the internal structure of a complex word is not so obvious. The word *unhappiness*, for instance, could apparently be analyzed in either of the ways indicated in figure 4.8.

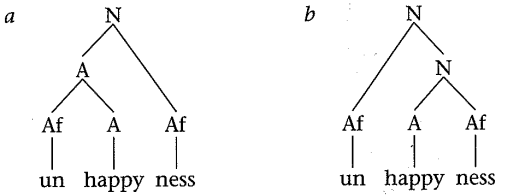


Figure 4.8 Two possible structures for the word *unhappiness*

By considering the properties of the affixes *un-* and *-ness*, however, it is possible to find an argument that favours figure 4.8a over 4.8b. The key observation is that the prefix *un-* combines quite freely with adjectives, but not with nouns.

Table 4.14 The prefix un-

un + *Adj*	*un* + *N*
unable	*unknowledge
unkind	*unhealth
unhurt	*uninjury

This suggests that *un-* must combine with the adjective *happy* before it is converted into a noun by the suffix *-ness*, exactly as depicted in figure 4.8a.

By contrast, in a word such as *unhealthy*, the prefix *un-* can be attached only *after* the suffix *-y* has been added to the root. Otherwise, there would be no adjective category to which it could attach.

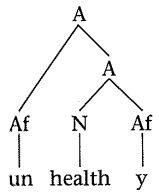


Figure 4.9 The internal structure of the word *unhealthy*

Constraints on derivation

Derivation usually does not apply freely to all members of a given category. For instance, the suffix *-ant* (see table 4.13) can combine only with bases of Latin origin—as in *defendant, assailant, contestant, servant,* and so forth. This is why it cannot occur with bases such as *fight* and *teach* (**fightant, *teachant*), which are of native English origin.

Sometimes, a derivational affix is able to attach only to bases with particular phonological properties. A good example of this involves the English suffix *-en* (see table 4.13), which combines with adjectives to create verbs with a causative meaning ('cause to become X'). As the following examples illustrate, however, there are many adjectives with which *-en* cannot combine.

Table 4.15 Restrictions on the use of *-en*

Acceptable	*Unacceptable*
whiten	*abstracten
soften	*bluen
madden	*angryen
quicken	*slowen
liven	*greenen

The suffix *-en* is subject to a phonological constraint. In particular, it can only combine with a monosyllabic base that ends in an obstruent. Hence it can be added to *white*, which is both monosyllabic and ends in an obstruent, but not to *abstract*, which has two syllables, or to *blue*, which does not end in an obstruent.

Two classes of derivational affixes *(Advanced)*

It is common to distinguish between two types of derivational affixes in English. **Class 1** affixes are characterized by the fact that they often trigger changes in the

Table 4.16 Typical effects of Class 1 affixes

Affix	*Sample word*	*Change triggered by affix*
-ity	san-ity	vowel in the base changes from /e/ to /æ/ (cf. *sane*)
	public-ity	final consonant of the base changes from /k/ to /s/, stress shifts to second syllable (cf. *public* vs *publicity*)
-y	democrac-y	final consonant of the base changes from /t/ to /s/, stress shifts to second syllable (cf. *democrat* vs *democracy*)
-ive	product-ive	stress shifts to second syllable (cf. *product* vs *productive*)
-(i)al	part-ial	final consonant of the base changes from /t/ to /ʃ/ (cf. *part*)
-ize	public-ize	final consonant of the base changes from /k/ to /s/ (cf. *public*)
-ious	audac-ious	final consonant of the base changes from /s/ to /ʃ/ (cf. *audacity*)
-ion	nat-ion	final consonant of the base changes from /t/ to /ʃ/ (cf. *native*)

consonant or vowel segments of the base and may affect the assignment of stress. (As the final two examples in table 4.16 help show, Class 1 affixes often combine with bound roots.) In contrast, **Class 2** affixes tend to be phonologically neutral, having no effect on the segmental makeup of the base or on stress assignment.

Table 4.17 Some typical Class 2 affixes

Affix	*Sample word*	*Change triggered by affix*
-ness	prompt-ness	none
-less	hair-less	none
-ful	hope-ful	none
-ly	quiet-ly	none
-er	defend-er	none
-ish	self-ish	none

When Class 1 and Class 2 affixes appear in the same word, the former type of morpheme must normally occur closer to the root than the latter. Moreover, while a Class 1 affix can follow another Class 1 affix and while a Class 2 affix can precede another Class 2 affix, a Class 2 affix usually cannot come before a Class 1 affix. The various possibilities are illustrated below.

13)

relat-ion-al	audac-ious-ness	*fear-less-ity	fear-less-ness
root 1 1	root 1 2	root 2 1	root 2 2

Notice that in the form that is ruled out (**fearlessity*) a Class 1 affix follows a Class 2 affix.

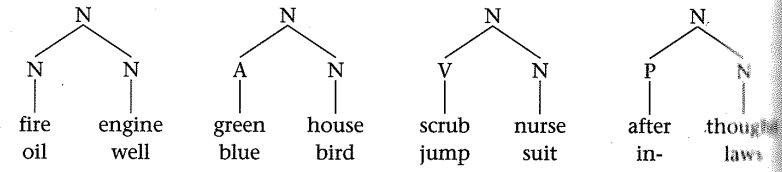
COMPOUNDING

Another common way to build words in English involves compounding, the combination of lexical categories (nouns, adjectives, verbs, or prepositions). With very few exceptions, the resulting compound word is a noun, a verb, or an adjective (see figure 4.10). (Possible examples of compound prepositions include the words *into* and *onto*.) In these and most other compounds of this type, the rightmost morpheme determines the category of the entire word. Thus, *greenhouse* is an N because its rightmost component is an N, *spoonfeed* is a V because *feed* also belongs to this category, and *nationwide* is an A just as *wide* is. The morpheme that determines the category of the entire word is called the **head**.

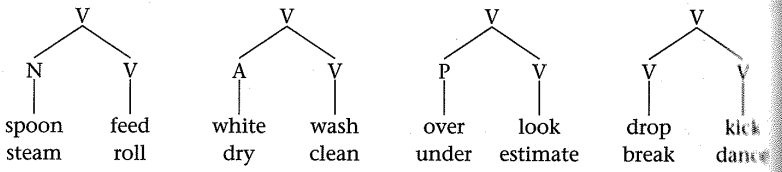
Once formed, compounds can be combined with other lexical categories to create still larger compounds, as in the following examples in figure 4.11.

In addition, the word formation processes responsible for derivation and compounding can interact with each other. In figure 4.12, for instance, a compound is formed by combining a simple word (*debate*) with the derived word *abortion*.

Noun compounds



Verb compounds



Adjective compounds

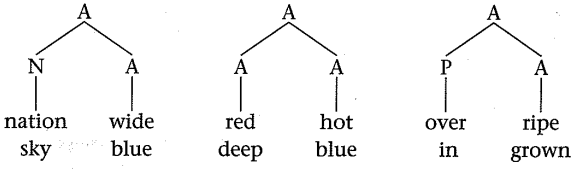


Figure 4.10 Some English compounds

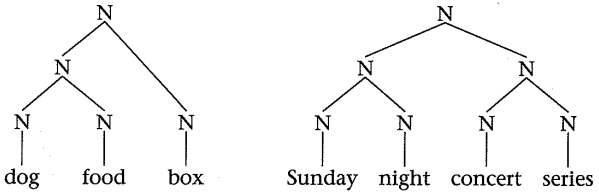


Figure 4.11 Compounds formed from smaller compounds

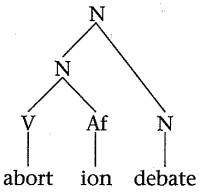


Figure 4.12 The interaction of derivation with compounding

4.1 PROPERTIES OF COMPOUNDS

English orthography is not consistent in representing compounds since they are sometimes written as single words, sometimes with an intervening hyphen, and sometimes as separate words. In terms of pronunciation, however, there is an important generalization to be made. In particular, A–N compounds are characterized by a more prominent stress on their first component. In non-compounds consisting of an adjective and a noun, in contrast, the second element is generally stressed.

Table 4.18 Compounds versus non-compounds

Compound word		*Non-compound expression*	
greénhouse	'an indoor garden'	green hoúse	'a house painted green'
bláckboard	'a chalkboard'	black boárd	'a board which is black'
wét suit	'a diver's costume'	wet suít	'a suit that is wet'

A second distinguishing feature of compounds in English is that tense and plural markers can typically not be attached to the first element, although they can be added to the compound as a whole. (There are some exceptions, however, such as *passers-by* and *parks supervisor*.)

14)

tense on the first element in a compound:
*The player [dropped kick] the ball through the goalposts.

tense on the entire compound:
The player [drop kick]ed the ball through the goalposts.

15)

pluralization of the first element in a compound:
*The [foxes hunter] didn't have a licence.

pluralization of the entire compound:
The [fox hunter]s didn't have a licence.

The preceding criteria are especially helpful for identifying compounds whose initial component is a verb or a noun. Compounds whose first element is an adjective (*greenhouse*, *wet suit*) can be identified with the help of a different test. As illustrated in the following example, the A in a compound cannot be preceded by a word such as *very*.

16)

compound with *very*:
*We live next to a very [greenhouse].

Of course, when it is not part of a compound, an adjective can typically be accompanied by this type of word.

17)

very with an adjective that is not part of a compound:
We live next to a very green fence.

3.2 Types of Compounds

Compounds are used to express a wide range of semantic relationships in English. The following table contains examples of just some of the semantic patterns found in N–N compounds.

Table 4.19 Some N–N compounds

Example	*Meaning*
steamboat	'a boat powered by steam'
airplane	'a conveyance that travels through the air'
air hose	'a hose that carries air'
air field	'a field where airplanes land'
fire truck	'a vehicle used to put out fires'
fire drill	'a practice in the event of a fire'
bath tub	'a place in which to bathe'
bath towel	'a towel used after bathing'

In most cases, a compound denotes a subtype of the concept denoted by its head (the rightmost component). Thus *dog food* is a type of food, a *cave man* is a type of man, *sky-blue* is a type of blue, and so on. Such compounds, which include all the examples in table 4.19, are called **endocentric**. In a smaller number of cases, however, the meaning of the compound does not follow from the meanings of its parts in this way. Thus, a *redhead* is not a type of head; rather, it is a person with red hair. Similarly, a *redneck* is a person and not a type of neck. Such compounds are said to be **exocentric**.

A very striking feature of exocentric compounds shows up in English in those cases where the head of the compound has an irregular plural. Consider in this regard the following examples.

Table 4.20 Pluralization in English compounds

In endocentric compounds	*In exocentric compounds*
oak leaves	Maple Leafs (Toronto's NHL hockey team)
wisdom teeth	sabre tooths (extinct species of tiger)
club feet	bigfoots (mythical creatures; 'Sasquatch')
policemen	Walkmans ('a type of portable radio')

Notice that the exocentric compounds permit the plural suffix *-s* for words such as *leaf, tooth, foot,* and *man* even though these forms require an irregular plural when used elsewhere, including in endocentric compounds.

3.3 Compounds in Other Languages

Although the rules for forming compounds differ from language to language, the practice of combining lexical categories to build a word is very widespread. As the

following examples from various languages help illustrate, compound nouns are especially common.

Table 4.21 Noun compounds in various languages

Korean		
kot elum	isul pi	nwun mwul
straight ice	dew rain	eye water
'icicle'	'drizzle'	'tears'
Tagalog		
tanod bayan	anak araw	tubig ulan
guard town	child sun	water rain
'policeman'	'albino'	'rainwater'
German		
Gast-hof	Wort-bedeutungs-lehre	Fern-seher
guest inn	word meaning theory	far seer
'hotel'	'semantics'	'television'
Finnish		
lammas-nahka-turkki	elin-keino-tulo-vero-laki	
sheep skin coat	life's means income tax law	
'sheepskin coat'	'income tax law'	
Tzotzil		
piʃ-xól	mé?-k'ínobal	ʔóra-tʃón
wrap-head	mother-mist	rightaway-snake
'hat'	'rainbow'	'deadly viper'

With the exception of Tagalog, in which compounds are left-headed, these languages all have compounds in which the rightmost element is the head.

A special type of compounding process involves **incorporation**, the combination of a word (usually, but not always, a noun) with a verb to form a compound verb. Although English does not make use of incorporation, the process is common in other languages. The following examples are from Chukchee, spoken in northeastern Siberia, and the Micronesian language Ponapean. (As these examples help illustrate, incorporation often involves phonological adjustments to the noun and/or the verb.)

18)

a. Chukchee

without incorporation:	*with incorporation:*
Tə-pelarkən qoraŋə.	Tə-qora-pelarkən
I leave reindeer	I-reindeer-leave
'I'm leaving the reindeer'	'I'm in the process of reindeer-leaving.'

b. Ponapean

without incorporation:	*with incorporation:*
I pahn pereki lohs	I pahn perek-los
I will unroll mats	I will unroll-mats
'I will unroll the mats.'	'I will engage in mat unrolling.'

4 OTHER TYPES OF WORD FORMATION

Derivation and compounding are the two most common types of word formation in English, but they are not the only ones. As the examples presented in this section will show, there are various other ways to create new words.

4.1 CONVERSION

Conversion is a process that assigns an already existing word to a new syntactic category. Even though it does not add an affix, conversion is often considered to be a type of derivation because of the change in category and meaning that it brings about. (For this reason, it is sometimes called **zero derivation**.)

Many examples of conversion involving the creation of a new verb from a noun were given in the first chapter of this book (*beach a boat, winter in Mexico,* and so on). Table 4.22 contains examples of the three most common types of conversion in English. (As noted in section 1.3 above, nouns derived from verbs sometimes undergo stress shift, which moves the stress to the initial syllable. The effects of this phenomenon can be seen in the first three examples in the middle column.)

Table 4.22 Some examples of conversion

V derived from N	*N derived from V*	*V derived from A*
ink (a contract)	(a building) pérmit	dirty (a shirt)
butter (the bread)	(an exciting) cóntest	empty (the box)
ship (the package)	(a new) súrvey	better (the old record)
nail (the door shut)	(a brief) report	right (a wrong)
button (the shirt)	(an important) call	total (a car)

Less common types of conversion can yield an N from an A (*the poor, a gay*) and even a V from a P (*down a beer, up the price*).

Conversion is usually restricted to words containing a single morpheme, although there are a few exceptions such as *propos-ition* (noun and verb), *refer-ee* (noun and verb), and *dirt-y* (adjective and verb). In some cases, conversion can even apply to a compound, as when the noun *grandstand* is used as verb (*he likes to grandstand*) in the sense of 'show off'.

4.2 CLIPPING

Clipping is a process that shortens a polysyllabic word by deleting one or more syllables. Some of the most common products of clipping are names—*Liz, Ron, Rob, Sue,* and so on. Clipping is especially popular in the speech of students, where it has yielded forms like *prof* for *professor, phys-ed* for *physical education, poli-sci* for *political science,* and *burger* for *hamburger.* However, many clipped forms have also been accepted in general usage: *doc, ad, auto, lab, sub, deli, porn, demo,* and *condo.*

In some cases, speakers may not even realize that a particular word is the product of clipping: the word *zoo,* for instance, was formed in this manner from *zoological garden.* A more recent example of this sort that has rapidly become part of general English vocabulary is *fax,* from *facsimile* (meaning 'exact copy or reproduction').

4.3 BLENDS

Blends are words that are created from non-morphemic parts of two already existing items. Well-known examples of blends include *brunch* from *breakfast* and *lunch, smog* from *smoke* and *fog, spam* from *spiced* and *ham, telethon* from *telephone* and *marathon, aerobicise* from *aerobics* and *exercise, chunnel* (for the new underwater link between Britain and the continent) from *channel* and *tunnel,* and *infomercial* from *information* and *commercial.* As in these examples, a blend is usually formed from the initial part of one word and the final part of a second one.

Some blends have become so integrated into the standard vocabulary of English that speakers are unaware of their status. For example, relatively few people know that blending has produced *chortle* (coined by author Lewis Carroll) from *chuckle* and *snort, motel* from *motor* and *hotel, bit* (in computer jargon) from *binary* and *digit,* and *modem* from *modulator* and *demodulator.*

Sometimes, a word is formed by a process that seems to be on the borderline between compounding and blending in that it combines all of one word with part of another. Examples of this in English include *perma-press* (for *permanent-press*), *workaholic, medicare, guesstimate,* and *threepeat* (used these days by sports fans to refer to the winning of a championship in three successive years).

4.4 BACKFORMATION

Backformation is a process that creates a new word by removing a real or supposed affix from another word in the language. *Resurrect* was originally formed in this way from *resurrection.* Other backformations in English include *enthuse* from *enthusiasm, donate* from *donation, orient* or *orientate* from *orientation,* and *self-destruct* from *self-destruction.* Sometimes, backformation involves an incorrect assumption about a word's form: for example, the word *pea* was derived from the singular noun *pease,* whose final /z/ was incorrectly interpreted as the plural suffix.

A major source of backformations in English has been words that end in *-or* or *-er* and have meanings involving the notion of an agent, such as *editor, peddler, swindler,* and *stoker.* Because hundreds of words like these are the result of affixation, it was

assumed that these words too had been formed by adding *-or* or *-er* to a verb. By the process of backformation, the verbs *edit*, *peddle*, *swindle*, and *stoke* were formed. A more recent addition is the verb *lase*, produced by backformation from *laser*, which itself had an unusual origin (see section 4.5).

Backformation continues to produce new words in modern English. For instance, the form *attrit*, from *attrition*, was often used by military officials during the recent Gulf War to refer to the decimation of enemy troops (as in *The enemy is 50 percent attritted*). Among the backformations noticed recently by the authors of this chapter are *liposuct* (from *liposuction*, seen in a magazine article), *orate* (from *oration*, used in a newspaper editorial), and *tuit* (from *intuition*, heard on CBC Radio).

4.5 Acronyms

Acronyms are formed by taking the initial letters of (some or all) the words in a phrase or title and pronouncing them as a word. This type of word formation is especially common in names of organizations and in military and scientific terminology. Some examples of acronyms include UNICEF for United Nations International Children's Emergency Fund, CIDA for Canadian International Development Agency, NATO for North Atlantic Treaty Organization, and AIDS for acquired immune deficiency syndrome.

In some cases, speakers may not know that a word in their vocabulary originated as an acronym. Three commonly used words of this type are *radar* (from radio detecting and ranging), *scuba* (self-contained underwater breathing apparatus), and *laser* (light amplification by simulated emission of radiation). The name of the computer language BASIC is an acronym for Beginner's All-purpose Symbolic Instruction Code.

4.6 Onomatopoeia

All languages have words that have been created to sound like the thing that they name. Examples of such onomatopoeic words in English include *buzz*, *hiss*, *sizzle*, and *cuckoo*. Since **onomatopoeic** words are not exact phonetic copies of noises, their form can differ from language to language.

Table 4.23 Onomatopoeia across languages

English	*Japanese*	*Tagalog*
cock-a-doodle-doo	kokekokko	kukaok
meow	nyaa	ngiyaw
chirp	pii-pii	tiririt
bow-wow	wan-wan	aw-aw

English does not always have an equivalent for the onomatopoeic words found in other languages. The Athapaskan language Slavey, for instance, has the onomatopoeic word *sah sah sah* for 'the sound of a bear walking unseen not far from camp', *ðik* for 'the sound of a knife hitting a tree', and *tɬóòtʃ* for 'the sound of an egg splattering'.

4.7 Other sources

In still other cases a word may be created from scratch. Called **word manufacture** or **coinage**, this phenomenon is especially common in cases where industry requires a new and attractive name for a product. *Kodak*, *Dacron*, *Orlon*, and *Teflon* are examples of product names that are the result of word manufacture. (Notice how the *-on* of the final three words makes them more scientific-sounding, perhaps because an affix of this form occurs in various learnèd words of Greek origin such as *phenomenon* and *automaton*.)

Finally, it is sometimes possible to create new words from names. For example, brand names sometimes become so widely used that they are accepted as generic terms (*kleenex* for 'facial tissue' or *xerox* for 'photocopy'). A related practice is exemplified by the words *watt*, *curie*, *fahrenheit*, and *boycott*, all of which were derived from the names of individuals (usually the inventors or discoverers) associated with the things to which they refer.

5 INFLECTION

Virtually all languages have contrasts such as singular versus plural, and past versus present or non-past. These contrasts are often marked with the help of **inflection**, the modification of a word's form (through affixation, internal change, reduplication or suppletion) to indicate the grammatical subclass to which it belongs. (The base to which an inflectional affix is added is sometimes called a **stem**.) In the case of most English nouns, for instance, inflection marks the plural subclass by adding the affix *-s*. In the case of verbs, inflection can mark a distinction between the past and non-past subclasses—usually by adding the suffix *-ed* to indicate the past tense.

Table 4.24 Inflection for number and tense

Number		*Tense*	
Singular	*Plural*	*Non-past*	*Past*
apple	apple-s	work	work-ed
car	car-s	jump	jump-ed
dog	dog-s	hunt	hunt-ed

Because inflection applies after the word formation processes discussed in sections 2 to 4, the plural affix can be added to the output of derivation and compounding, as well as to a simple noun.

Table 4.25 Inflection of derived and compound nouns

Derived nouns	*Compound nouns*
[worker]-s	[football]-s
[creation]-s	[outlaw]-s
[kingdom]-s	[blackboard]-s

Similarly, tense affixes can be attached to the output of derivation and compounding as well as to simple verbs.

Table 4.26 Inflection of derived and compound verbs

Derived verbs	*Compound verbs*
[hospitalize]-d	[whitewash]-ed
[activate]-d	[backorder]-ed

5.1 INFLECTION VERSUS DERIVATION

As the preceding examples show, inflection is expressed primarily by means of affixation. Thus, in English the plural is marked by the suffix *-s* (barring a few exceptions such as *man/men*) while the past is generally marked by the suffix *-ed* (although a number of verbs use internal change, as in *sink/sank* and *ride/rode*).

Because inflection and derivation are both marked by affixation, the distinction between the two can be a subtle one and it is sometimes unclear which function a particular affix has. Three criteria are commonly used to help distinguish between inflectional and derivational affixes.

Category change

First, inflection does not change either the grammatical category or the type of meaning found in the word to which it applies.

Figure 4.13 The output of inflection: there is no change in either the category of the base or the type of meaning it denotes.

The form produced by adding the plural suffix *-s* in figure 4.13a is still a noun and has the same type of content or meaning as the base. Even though *books* differs from *book* in referring to several things rather than just one, the type of thing(s) to which it refers remains the same. Similarly, a past tense suffix such as the one in figure 4.13b indicates that the action took place in the past, but it does not change the word's category (which remains a V), nor does it modify the type of meaning. The verb continues to denote an action regardless of whether the tense is past or non-past.

In contrast, derivational suffixes characteristically change the category and/or the type of meaning of the form to which they apply and are therefore said to create a new word. Consider the following examples of derivation. As figure 4.14a shows, *-ize* makes a verb out of an adjective, changing the type of meaning it expresses from a property (*modern*) to an action (*modernize*). Parallel changes in category and type of meaning are brought about by *-ment* (V to N) and *-al* (N to A). Matters are a little different in the case of *-dom*, which does not bring about a category change in the word *kingdom* (since both the base and the resulting word are Ns). However, *-dom* does modify the type of meaning from 'person' (for *king*) to 'place' (for *kingdom*).

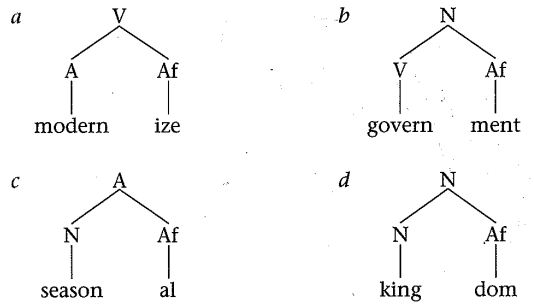


Figure 4.14 The output of derivation: there is a change in the category of the word and/or the type of meaning it denotes.

Order

A second property of inflectional affixes has to do with the order in which they are combined with a base relative to derivational affixes. As the following example illustrates, a derivational affix must combine with the base before an inflectional affix does. (IA = inflectional affix; DA = derivational affix)

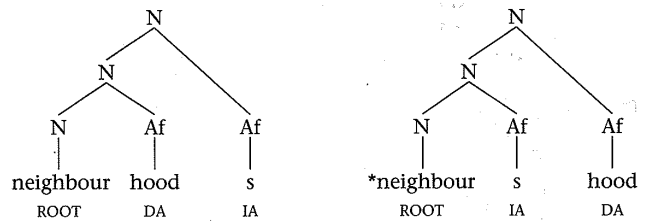


Figure 4.15 The relative positioning of derivational and inflectional affixes: the derivational affix must be closer to the root.

The positioning of inflectional affixes outside derivational affixes in these examples reflects the fact that inflection takes place after derivation.

Productivity

A third criterion for distinguishing between inflectional and derivational affixes has to do with **productivity**, the relative freedom with which they can combine with bases of the appropriate category. Inflectional affixes typically have relatively few exceptions. The suffix *-s*, for example, can combine with virtually any noun that allows a plural form (aside from a few exceptions such as *oxen* and *feet*). In contrast, derivational affixes characteristically apply to restricted classes of bases. Thus, *-ize* can combine with only certain adjectives to form a verb.

19)

modern-ize	*new-ize
legal-ize	*lawful-ize
final-ize	*permanent-ize

In the case of verbs, matters are somewhat more complicated, since many English verbs have irregular past tense forms (*saw*, *left*, *went*, and so on). Nonetheless, the distribution of the inflectional affix *-ed* is still considerably freer than that of a derivational affix such as *-ment*. In table 4.27, for example, all the verbs can take the regular past tense ending, but only those in the first three rows are able to take the *-ment* suffix.

Table 4.27 Compatibility of verb bases with inflectional *-ed* and derivational *-ment*

Verb	*With* -ed	*With* -ment
confine	confined	confinement
align	aligned	alignment
treat	treated	treatment
arrest	arrested	*arrestment
straighten	straightened	*straightenment
cure	cured	*curement

5.2 English inflectional affixes

With only eight inflectional affixes (all suffixes), English is not a highly inflected language. Some languages have dozens of inflectional affixes and encode contrasts not represented in English (see section 6 for some examples). Table 4.28 gives a complete list of English inflectional affixes.[3]

Table 4.28 English inflectional affixes

Nouns	
Plural *-s*	the book<u>s</u>
Possessive *-'s*	John<u>'s</u> book
Verbs	
3rd person sing. non-past *-s*	John read<u>s</u> well.
Progressive *-ing*	He is work<u>ing</u>.
Past tense *-ed*	He work<u>ed</u>.
Past participle *-en/-ed*	He has eat<u>en</u>/finish<u>ed</u>.
Adjectives	
Comparative *-er*	the small<u>er</u> one
Superlative *-est*	the small<u>est</u> one

Regular versus irregular inflection

Although the majority of inflection in English involves regular affixation, some words mark inflectional contrasts in less regular ways. This is most obvious in the case of verbs, a number of which indicate past tense by internal changes of various sorts and even suppletion: *come-came*, *see-saw*, *fall-fell*, *eat-ate*, *drink-drank*, *lose-lost*, *think-thought*, *is-was*, *go-went*, and so on.

There is apparently a fundamental difference in the way in which regular and irregular inflection operates. In particular, it seems that whereas regular inflected forms are constructed as needed in accordance with a general morphological rule (such as 'Add *-ed* to mark the past tense'), irregular forms must be stored permanently in the language user's memory. Some evidence of this difference comes from studies of how long it takes speakers to utter the past tense form of a verb when presented with the base. For irregular forms, there is a correlation between response time and frequency of the verb: thus it takes less time to give the past form of frequent verbs such as *see* and *find* than it does for infrequent verbs such as *stride* and *bid*—presumably because it takes longer to locate infrequently used forms in one's memory. In the case of regular verbs, in contrast, response time is independent of frequency: because the past tense is formed by a regular rule, there is no need to 'look up' the word in the mental dictionary and all verbs can be handled with equal speed.

6 FURTHER EXAMPLES OF INFLECTION *(ADVANCED)*

In this section, we will consider several types of grammatical information that are commonly expressed in human language with the help of inflectional affixes.

6.1 Number

Number is the morphological category that expresses contrasts involving countable quantities. The simplest number contrast consists of a two-way distinction between **singular** (one) and **plural** (more than one). This is the contrast found in English, where a noun usually takes the suffix *-s* if it refers to two or more entities.

Even this basic distinction is not found in all languages, however. In Nancowry (spoken in India's Nicobar Islands), for example, number is not marked on nouns at all. A sentence such as *20)* is therefore ambiguous since *nɔ́t* 'pig' can refer to one or more pigs.

20)

sák nɔ́t ʔin tsiʔə̀j.
spear pig the we
'We speared the pig(s).'

In Inuktitut (spoken in northern Canada), on the other hand, there is a three-way number contrast involving singular, dual (two and only two), and plural (more than two).

21)

iglu	'a house'
igluk	'two houses'
iglut	'three or more houses'

6.2 Noun Class

Some languages divide nouns into two or more inflectional classes, based on shared phonological and/or semantic properties. The Bantu language SiSwati, for instance, makes use of prefixes to distinguish among more than a dozen noun classes, some of which are given in table 4.29. (Tone is not represented in these examples.)

Table 4.29 Some noun classes in SiSwati

Prefix	*Description of class*	*Example*	
um(u)-	persons	um-fana	'boy'
li-	body parts, fruit	li-dvolo	'knee'
s(i)-	instruments	si-tja	'plate'
in-	animals	in-ja	'dog'
bu-	abstract properties	bu-bi	'evil'
pha-	locations	pha-ndle	'outside'

The gender contrasts of modern French also make up a type of noun classification system. Although the term *gender* is used by linguists to mean 'kind' rather than 'sex', there is a partial correlation between the French gender classes and the sex of the objects to which nouns can refer. Thus *frère* 'brother' is masculine while *sœur* 'sister' is feminine. However, most inanimate nouns are classified more or less arbitrarily: *lune* 'moon' is feminine, but *monde* 'world' is masculine. Even some nouns referring to animate entities seem to be classified arbitrarily: French *victime* 'victim' is feminine regardless of whether the person referred to is male or female and all German words ending in the suffix *-chen*, including *Mädchen* 'young girl', are neuter.

Noun class can be marked in a variety of ways. In some languages, the determiner is inflected to indicate the class of the noun. For example, singular nouns in French take the definite determiner *le* if masculine but *la* if feminine. In other languages, inflectional affixes rather than determiners can be used to indicate the gender class of the noun. Russian, for instance, uses one set of suffixes for nouns in the feminine, animate class and another set for nouns in the masculine, animate class. The following examples show the gender endings for nouns that function as subject of a sentence.

Table 4.30 Gender distinctions in Russian

Class	*Suffix*	*Example*	
Masculine	-Ø	dom	'house'
Feminine	-a	ulits-a	'street'
Neuter	-o	tʃuvstv-o	'sensation'

6.3 Case

Still another type of inflectional contrast associated with nouns in many languages involves **case**—a category that encodes information about an element's grammatical role (subject, direct object, and so on). In Modern English, this information is expressed largely through word order and the use of prepositions.

22)

Bette composed a song on the bus.

In this sentence, the subject *Bette* occurs to the left of the verb and the direct object *a song* appears to the right, while the element expressing location (*the bus*) is preceded by the preposition *on*. In many languages, however, these distinctions are marked by inflectional affixes. As an illustration of this, consider the following set of related nominal forms (called a **nominal paradigm** or **declension**) for the Turkish word *ev* 'house'.

Table 4.31 Turkish case

Case	*Form*	*Type of element that it marks*
Nominative	ev-Ø	the subject
Accusative	ev-i	the direct object
Dative	ev-e	the recipient
Genitive	ev-in	the possessor
Locative	ev-de	a place or location
Ablative	ev-den	direction away from somewhere

The following sentences illustrate the use of these case suffixes.

23)

a. Adam-Ø ev-i Ahmed-e göster-di.
Man-Nom house-Ac Ahmed-Dat show-past.
'The man showed the house to Ahmed.'

b. Ev-in rengi-Ø mävidir.
house-Gen colour-Nom blue
'The house's colour is blue.'

c. Adam-Ø ev-de kaldi.
man-Nom house-Loc stayed
'The man stayed in the house.'

d. Adam-Ø ev-den tʃikti.
man-Nom house-Abl went
'The man went from the house.'

Notice how in the final sentence, for example, *Adam* 'man' bears the zero ending of the nominative to indicate that it is subject while *ev* 'house' bears the ablative suffix indicating the place from which the man went.

The contrasts represented in the Turkish case system are intermediate in complexity compared to Finnish, which has fifteen distinct case categories, and Rumanian, which has only two.

Ergative case marking

Some languages make use of case marking to encode grammatical contrasts quite unlike those found in familiar European languages. In the Australian language Yidin^{y}, for instance, the case system groups together the subject of an **intransitive** verb and the direct object of a **transitive** verb (both of which receive a zero ending) while using a special marker (*-ngu*) for the subject of a transitive verb. (A verb is transitive if it takes a direct object; otherwise, it is intransitive.)

24)

a. Yidin^{y} sentence with a transitive verb:
Wagudya-ngu dyugi-Ø gundal.
man-Erg tree-Abs is cutting.
'The man is cutting the tree.'

b. Yidin^{y} sentence with an intransitive verb:
Wagudya-Ø gundal
man-Abs is cutting
'The man is cutting.'

In this type of system, the case associated with the subject of the transitive verb, *wagudya* 'man' in *24a)*, is called the **ergative**. The case associated with the direct object (*dyugi* 'tree' in the first sentence) and with the subject of an intransitive verb (*wagudya* in the second sentence) is called the **absolutive**.

Ergative case marking is found in a varied set of languages, including Basque (in Spain), Tagalog (in the Philippines), Georgian (in the Caucasus), Inuktitut (in northern Canada and Greenland), and Halkomelem (on the west coast of Canada). Ergative case marking is far less common than the nominative-accusative pattern, which groups together the subjects of transitive and intransitive verbs, distinguishing them from direct objects. This is the pattern found in Turkish (as noted previously), German, Russian, Japanese, Korean, and many other languages.

English nouns and pronouns

At one time, English nouns and determiners (words such as *the*) were inflected for case (see discussion in chapter 8). In modern English, however, the only remnant of this case system is the genitive suffix *-'s*, used to mark possessors (*the man's book*). Neither nouns nor determiners are inflected to distinguish grammatical relations such as subject and direct object.

25)

a. the man in subject position:
The man left. The man read the book.

b. the man in direct object position:
A noise frightened the man.

However, pronouns exhibit a more elaborate set of contrasts, distinguishing a nominative (*I, they, he*), an accusative (*me, them, him*), and a genitive (*my, their, his*).

26)

Nominative: *He* left. (intransitive verb) *He* read the book. (transitive verb)
Accusative: A noise frightened *him*.
Genitive: Sam took *his* car.

Since the same form of the pronoun is used for the subject of an intransitive verb and the subject of a transitive verb and since this form differs from the one used for direct objects, these contrasts follow the nominative-accusative pattern.

6.4 PERSON AND NUMBER AGREEMENT

A widely attested type of verbal inflection in human language involves **person**—a category that typically distinguishes among the first person (the speaker), the second person (the addressee), and the third person (anyone else). In many languages, the verb is marked for both the person and number (singular or plural) of the subject. When one category is inflected for properties (such as person and number) of another, the first category is said to **agree** with the second.

Agreement is found in Italian, which exhibits the following contrasts in the present tense. (The set of inflected forms associated with a verb is called a **verbal paradigm** or a **conjugation**.)

Table 4.32 The Italian present tense paradigm

	Singular		*Plural*	
1st person	parl-o	'I speak'	parl-iamo	'we speak'
2nd person	parl-i	'you speak'	parl-ate	'you speak'
3rd person	parl-a	'she, he speaks'	parl-ano	'they speak'

Because the inflectional affixes provide so much information about the person and number of the subject phrase, this element need not be overtly present in Italian. Thus, *parla italiano* 'speaks Italian' can make up a complete sentence. The permissibility of such 'understood subjects' is a common feature of languages with rich verbal inflection.

Modern English has a much more impoverished system of person and number agreement in the verb, and an inflectional affix is used only for the third person singular in the non-past tense.

Table 4.33 The English verbal paradigm (non-past forms)

	Singular	*Plural*
1st person	I speak	we speak
2nd person	you speak	you speak
3rd person	she, he, or it speaks	they speak

Except for commands, formal English differs from Italian and many other languages with rich verbal inflection in requiring a complete sentence to have an overtly expressed subject.

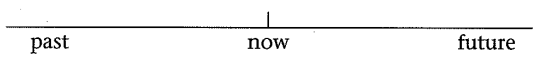
27)

*Speaks English.

6.5 TENSE

Tense is the category that encodes the time of an event with reference to the moment of speaking. Thus, the past tense is used with verbs denoting an event that occurs prior to the moment of speaking.

There are many different types of tense systems in the languages of the world. In terms of inflection, for example, English makes a two-way contrast between past (marked by the inflectional suffix *-ed* in regular verbs) and the non-past (unmarked). Notice that the non-past form of the verb can be used for both present and future events.



past (*-ed*) (He worked hard)

non-past (unmarked) (We know him. I leave tomorrow)

Figure 4.16 Tense in English

In the Australian language Dyirbal, in contrast, there is a two-way distinction between future and non-future. As the following examples show, the latter form can be used for both present and past events.

28)

a. future: bani-ɲ 'will come'

b. non-future: bani-ɲu 'came, is coming'

In Spanish and Lithuanian, on the other hand, inflectional endings are used to express a three-way contrast involving past, present, and future.

29)

	Spanish	*Lithuanian*
a.	Juan habl-ó bien. 'John spoke well.'	Dirb-au. 'I worked.'
b.	Juan habl-a bien. 'John speaks well.'	Dirb-u. 'I work.'
c.	Juan habl-ar-á bien. 'John will speak well.'	Dirb-siu. 'I will work.'

A still richer system of contrasts is found in the Bantu language ChiBemba, which uses its inflectional system to distinguish degrees of pastness and futurity. (In the following examples, the diacritics mark tone; affixes expressing tense contrasts are underlined.)

Table 4.34 Tense in ChiBemba

Past	*Future*
Remote past (before yesterday) ba-àlí-bomb-ele 'They worked.'	Remote future (after tomorrow) ba-ká-bomba 'They'll work.'
Removed past (yesterday) ba-àlíí-bomba 'They worked.'	Removed future (tomorrow) ba-kà-bomba 'They'll work.'
Near past (earlier today) ba-àcí-bomba 'They worked.'	Near future (later today) ba-léé-bomba 'They'll work.'
Immediate past (just happened) ba-á-bomba 'They worked.'	Immediate future (very soon) ba-áláá-bomba 'They'll work.'

SUMMING UP

This chapter is concerned with the structure and formation of **words** in human language. Many words consist of smaller formative elements, called **morphemes**. These elements can be classified in a variety of ways (**free** versus **bound**, **root** versus **affix**, **prefix** versus **suffix**) and can be combined and modified under various conditions to build words. Operations that can combine and modify morphemes include **affixation**, **cliticization**, **internal change**, **suppletion**, **reduplication**, and **compounding**.

The two basic types of word formation in English are **derivation** and **compounding**. Less common types of word formation include **conversion**, **blending**, **clipping**, and **backformation**. Once formed, words may be inflected to mark grammatical contrasts in **number**, **gender**, **case**, **person**, and **tense**.

NOTES

[1] An interesting fact about these forms is that although *ceive* and *mit* have no identifiable meaning, they undergo certain alternations that suggest that they have a special status in the language. Thus, the *ceive* in words like *receive* and *deceive* becomes *cept* in *receptive* and *deceptive* while the *mit* in words like *submit* and *permit* becomes *miss* in *submissive* and *permissive*. For further discussion of this point, see *Word Formation in Generative Grammar* by Mark Aronoff (Cambridge, MA: MIT Press, 1976).

[2] There are some exceptions to this generalization, including *delouse* and *enrage*, in which the rightmost element is a noun but the prefix determines that the whole word is a verb.

[3] There are three *-ing* affixes in English, one inflectional and two derivational. Inflectional *-ing* combines with a verb to give another verb, as in *He is breathing*. One derivational *-ing* combines with a verb to give a noun (*The breathing of the runners*) and the other converts a verb into an adjective (*the sleeping giant*)—see table 4.13. There are also two types of *-en/-ed* suffix, one inflectional as noted in table 4.28 and the other derivational. The latter converts verbs into adjectives so that they can appear in structures such as the following:

[a] The *stolen* money

[b] The *escaped* convict

Sources

The estimate that the average high school student knows 60 000 'basic' words comes from *The Language Instinct* by Steven Pinker (New York: Morrow), p. 150. The introduction to words and morphemes draws on the classic treatments found in L. Bloomfield's *Language* (New York: Holt, Rinehart and Winston, 1933), Gleason's *An Introduction to Descriptive Linguistics* (cited below), and C.F. Hockett's *A Course in Modern Linguistics* (New York: Macmillan, 1958). The discussion of word formation seeks to portray those aspects of recent and current work that represent widely accepted views and are appropriate for presentation in an introductory textbook. Much of this work is summarized in the books by Jensen, Katamba, and Spencer (cited below) and the many references cited therein.

The Arabic examples in section 1.3 are from p. 17 of the book by Spencer cited below. The tier-based analysis of Arabic word structure is based on work by John McCarthy, including his article "A Prosodic Theory of Nonconcatenative Morphology," *Linguistic Inquiry* 12:373–418 (1981). The facts concerning the requirement that *-ant* combine with a base of Latin origin (section 2.2) are noted on p. 71 of the book by Katamba cited below.

The example of Chukchee incorporation in section 3.3 is from p. 15 of the book by Spencer, cited below. The Ponapean example is from p. 212 of *A Ponapean Reference Grammar* by Kenneth Rehg (Honolulu: University of Hawaii Press, 1981).

The examples of conversion given in section 4.1 come largely from the discussion in the books by Jensen (pp. 92–93) and Bauer (pp. 229–30) cited below. The data on Slavey onomatopoeia is from "Slavey Expressive Terms" by M. Pepper, *Kansas Working Papers in Linguistics* 10:85–100 (1985).

The definition of *stem* introduced in section 5 is from the article by S. Anderson cited below (p. 163). The discussion of the difference between regular and irregular inflection draws on information from "Rules of Language" by Steven Pinker, *Science* 253:530–35 (Aug. 1991). The Nancowry example in the section on number was provided by R. Radhakrishnan. The data in the section on tense come principally from "Tense, Aspect and Mood" by S. Chung and A. Timberlake in *Language Typology and Syntactic Description,* Vol. 3, edited by T. Shopen (London: Cambridge University Press, 1985), pp. 202–58.

The questions for this chapter were prepared by Joyce Hildebrand. The data in problem 7 is from *Writing Transformational Grammars* by A. Koutsoudas (New York: McGraw-Hill, 1966).

Recommended Reading

Anderson, Stephen. 1988. "Morphological Theory." In *Linguistics: The Cambridge Survey.* Vol. 1. Edited by F. Newmeyer, 146–91. London: Cambridge University Press.

Bauer, L. 1983. *English Word-Formation.* New York: Cambridge University Press.

Gleason, H. 1955/1961. *An Introduction to Descriptive Linguistics.* New York: Holt, Rinehart and Winston.

Jensen, John. 1990. *Morphology: Word Structure in Generative Grammar.* Amsterdam: John Benjamins.

Katamba, Francis. 1993. *Morphology.* London: Macmillan.

Spencer, Andrew. 1991. *Morphological Theory.* Cambridge, MA: Blackwell.

Appendix: How to Identify Morphemes in Unfamiliar Languages

One part of morphological analysis involves identifying morphemes in unfamiliar languages and determining the nature of the information that they carry. (A number of the problems in the set of exercises that follow this chapter will give you an opportunity to practice this type of analysis.) The key procedure to use in working on this sort of problem can be stated simply as follows:

- Identify recurring strings of sounds and match them with recurring meanings.

Consider in this regard the following small sample of data from Turkish, consisting of four words along with their English translations. (A more realistic data sample would not only be much larger, but would also include sentences in which it might well be unclear where the word boundaries should be placed.)

Table 4.35 Some Turkish words

/mumlar/	'candles'
/toplar/	'guns'
/adamlar/	'men'
/kitaplar/	'books'

As you can probably see, the string of sounds /lar/ occurs in all four items in our sample. From the translations of these items, we can see that there is also a feature of meaning—namely, plurality—that is present in all four cases. Using the procedure just stated, we therefore hypothesize that /lar/ is the morpheme marking plurality in Turkish. Once this has been determined, we can then infer that /mum/ in /mumlar/ is also a morpheme (presumably with the meaning 'candle'), that /top/ in /toplar/ is

a morpheme (with the meaning 'gun'), and so on. A larger sampling of Turkish data would confirm the correctness of these inferences.

In doing morphological analysis in unfamiliar languages, there are a number of pitfalls to avoid. For the type of data normally investigated at the introductory level, the following guidelines should prove especially useful.

- Do not assume that the morpheme order in the language you are analyzing is the same as in English. In Korean, for example, morphemes indicating location (the rough equivalent of 'at', 'in', and so forth) follow rather than precede the noun (hence, *hakkyo-eyse* is literally 'school at').
- Do not assume that every semantic contrast expressed in English will also be manifested in the language you are analyzing. In Turkish, for example, there is no equivalent for English *the* and *a*. In Mandarin Chinese, the same pronoun form can be used to refer to a male or a female (there is no *he-she* distinction).
- Do not assume that every contrast expressed in the language you are analyzing is manifested in English. For example, some languages distinguish more than two number categories (Inuktitut distinguishes singular, dual, and plural; see section 6.1) and some languages make multiple tense contrasts (ChiBemba, discussed in section 6.5, has an eight-way distinction).
- Remember that a morpheme can have more than one form (allomorph). Just as the English plural suffix can be realized as /s/, /z/, or /əz/ (section 1.1), so morphemes in other languages can have more than one realization. For example, further study of Turkish would reveal that the plural suffix in this language can also be realized as /ler/, depending on the vowel in the base to which the suffix is attached. (This type of variation is discussed in more detail in chapter 6.)

QUESTIONS

1. Consider the following words and answer the questions below.

a) fly	f) reuse	k) spiteful	p) preplan
b) desks	g) triumphed	l) suite	q) optionality
c) untie	h) delight	m) fastest	r) prettier
d) tree	i) justly	n) deform	s) mistreat
e) dislike	j) payment	o) disobey	t) premature

i) For each word, determine whether it is simple or complex.
ii) Circle all of the bound morphemes. Underline all of the roots.

2. All but one of the following Persian words consist of more than one morpheme. (*Note*: *xar* means 'buy' and *-id* designates the past tense.)

a) xaridam	'I bought'
b) xaridi	'you (sg) bought'
c) xarid	'(he) bought'
d) naxaridam	'I did not buy'
e) namixaridand	'they were not buying'
f) naxaridim	'we did not buy'
g) mixarid	'(he) was buying'
h) mixaridid	'you (pl) were buying'

i) Try to match each of the following notions with a morpheme in the Persian data.

a) I	e) they
b) you (sg)	f) not
c) we	g) was/were + -ing (continuous)
d) you (pl)	h) buy

ii) How would you say the following in Persian?
a) They were buying.
b) You (sg) did not buy.
c) You (sg) were buying.

3. The following Turkish data involves allomorphic variation.

a) lokanta	'a restaurant'	lokantada	'in/at a restaurant'
b) kapɨ	'a door'	kapıda	'in/at a door'
c) randevu	'an appointment'	randevuda	'in/at an appointment'
d) baʃ	'a head'	baʃta	'in/at a head'
e) kitap	'a book'	kitapta	'in/at a book'
f) koltuk	'an armchair'	koltukta	'in/at an armchair'
g) taraf	'a side'	tarafta	'in/at a side'

i) Does the Turkish morpheme meaning 'in/at' have more than one allomorph?
ii) If so, what are the allomorphs? Describe their distribution as generally as possible.

4. Consider the following words.

a) desks	e) triumphed	i) preplan (V)	m) optionality
b) untie	f) ageless	j) fastest	n) prettier
c) invalid (A)	g) justice	k) reuse	o) mistreat
d) dislike (V)	h) payment	l) disobey	p) preview (V)

i) Draw a tree structure for each word.
ii) For the word *optionality*, what is the base for the affix *-ion*? What is the base for the suffix *-ity*? Are either of these bases also the root for the entire word? If so, which one?

5. Each of the following columns illustrates a different morphological process.

Column 1	*Column 2*	*Column 3*
a) mouse/mice	f) go/went	k) récord/recórd
b) dive/dove	g) is/was	l) ímport/impórt
c) take/took	h) good/better	m) cónvict/convíct
d) goose/geese	i) she/her	n) ímprint/imprínt
e) eat/ate	j) am/are	o) óutrage/outráge

i) What morphological process is at work in column 1? column 2? column 3?
ii) Describe in your own words the difference between the process exemplified in column 1 versus that in column 2.
iii) Think of at least one more English example to add to each column.

6. The following words can be either nouns or verbs.

record	outline	report
journey	convict	assault
exchange	imprint	answer
remark	reply	import
surprise	retreat	cripple

i) For each word, determine whether stress placement can be used to make the distinction between noun and verb.
ii) Think of two more English examples illustrating the process of stress shift to mark a category distinction.

7. The following Samoan data illustrates one of the morphological processes discussed in this chapter.

a)	mate	'he dies'	mamate	'they die'
b)	nofo	'he stays'	nonofo	'they stay'
c)	galue	'he works'	galulue	'they work'
d)	tanu	'he buries'	tatanu	'they bury'
e)	alofa	'he loves'	alolofa	'they love'
f)	taoto	'he lies'	taooto	'they lie'
g)	atama?i	'he is intelligent'	atamama?i	'they are intelligent'

i) What morphological process is illustrated by these data?
ii) Describe the process in your own words.
iii) If 'he is strong' in Samoan is *malosi*, how would you say 'they are strong' in Samoan?

8. The following data from Agta (spoken in the Philippines) illustrates a specific type of affix.

a)	dakal	'big'	dumakal	'grow big, grow up'
b)	darág	'red'	dumarág	'redden'
c)	furáw	'white'	fumuráw	'become white'

i) What is the affix in Agta meaning 'become X'?
ii) What type of affix is it?
iii) Describe its placement.

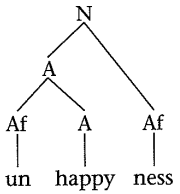
9. The following words from Chamorro, spoken in Guam and the Mariana Islands, illustrate some of the morphological processes described in this chapter.

I.	*Root*		*Derived word*	
a)	adda	'mimic'	aadda	'mimicker'
b)	kanno	'eat'	kakanno	'eater'
c)	tuge	'write'	tutuge	'writer'
II.	*Root*		*Derived word*	
d)	atan	'look at'	atanon	'nice to look at'
e)	saŋan	'tell'	saŋanon	'tellable'
f)	guaiya	'love'	guaiyayon	'lovable'
g)	tulaika	'exchange'	tulaikayon	'exchangeable'
h)	chalek	'laugh'	chalekon	'laughable'
i)	ngangas	'chew'	ngangason	'chewable'

III.	*Root*		*Derived word*	
j)	nalang	'hungry'	nalalang	'very hungry'
k)	dankolo	'big'	dankololo	'very big'
l)	metgot	'strong'	metgogot	'very strong'
m)	bunita	'pretty'	bunitata	'very pretty'

i) What morphological process is involved in I? in II? in III?
ii) Do any changes in lexical category take place in I? in II? in III?
iii) Formulate a general statement as to how the derived words in I are formed. Does the same statement apply to the derived words in III? If not, how would you change the statement to account for the forms in III?
iv) Does the affix in II have more than one allomorph? If so, what are the allomorphs? What is their distribution?

10. In this chapter, an argument was presented in favour of the following structure for the word *unhappiness*.



Using the same type of argument, justify tree structures for the words *incomprehensible*, *redisposal*, and *disestablishment*.

(*Hint:* This will involve determining the type of syntactic category with which the affixes in these words can combine; see table 4.12.)

11. In English, the suffix *-er* can be added to a place name. Examine the words in the two columns below.

Column 1	*Column 2*
Winnipeger	*Denverer
Yellowknifer	*Victoriaer
New Yorker	*Vancouverer
Newfoundlander	*Torontoer
Londoner	*Ganderer

i) In general terms, what does the suffix *-er* mean in these words?
ii) How is this *-er* different in meaning from the *-er* found in the words *skater* and *walker*?
iii) State the constraint in your own words.
iv) Does this constraint also apply to the type of *-er* used in the word *skater*? (*Hint*: What would you call 'one who discovers' or 'one who ploughs'?)

12. The following words have all been formed by compounding. Draw a tree structure for each word. If you are in doubt as to the lexical category of the compound, remember that the category of the head determines the category of the word.

a) football
b) billboard
c) sunbath
d) in-crowd
e) fast food
f) software
g) freeze-dry
h) overbook
i) tree trunk
j) lead free
k) shortstop
l) girlfriend
m) city centre
n) failsafe
o) potato peel
p) bitter-sweet
q) hockey match
r) coffee table
s) flower-power
t) blueprint
u) Greenpeace
v) space ship
w) brain dead
x) kill-joy

13. In this chapter, several ways of identifying compounds were discussed. Using the tests given in the lefthand column, verify the compound status of the forms in the righthand column.

Test	*Compound*
past tense	blow-dry
compatibility with *very*	loudmouth
plural	headlamp
stress	poorhouse

14. Examine the following compounds and answer the questions below.

Column 1	*Column 2*
a) loudmouth	h) cutthroat
b) skinhead	i) pickpocket
c) kill-joy	j) spoilsport
d) bath towel	k) crybaby
e) death blow	l) brain dead
f) bird-brain	m) blow-dry
g) Walkman	n) armchair

i) For each of the compounds in column 1, determine whether they are endocentric or exocentric.

ii) How do you form the plural of *Walkman* and *loudmouth*?
(*Hint*: see table 4.20. Also, pay special attention to the pronunciation of *mouth*. Is it any different here than when it is an independent word?)

15. The words in column 2 have been created from the corresponding word in column 1. Indicate the word formation process responsible for the creation of each word in column 2.

Column 1		*Column 2*
a) automation	→	automate
b) humid	→	humidifier
c) information, entertainment	→	infotainment
d) love, seat	→	loveseat
e) (to) reject	→	(a) reject
f) typographical error	→	typo
g) aerobics, marathon	→	aerobathon
h) act	→	deactivate
i) curve, ball	→	curve ball
j) perambulator	→	pram
k) (a) comb	→	comb (your hair)

l) beef, buffalo	→	beefalo
m) random access memory	→	RAM
n) megabyte	→	meg
o) teleprinter, exchange	→	telex
p) influenza	→	flu
q) They have finished	→	They've finished

16. Here are five instances where a new word is needed. Create a word for each of these definitions using the word formation process suggested. Fill in the blanks with your new words.
    a) Use an acronym . . . . for your uncle's second oldest brother.
    "We visited my _____ at Christmas."
    b) Use onomatopoeia . . . . for the sound of a coffee percolator at work.
    "I can't concentrate because my perc is _____ing."
    c) Use conversion . . . . for wrapping something breakable in bubbles.
    "You'd better _____ that ornament or else it might break."
    d) Use a compound . . . . for the annoying string of cheese stretching from a slice of hot pizza to one's mouth.
    "As the _____ hung precariously from my lips, our eyes met!"
    e) Use backformation . . . . for the action of backformation.
    "We had to _____ words in Linguistics today."

17. Create new words for each of the following situations.
    a) Use a product name . . . . for the act of scrubbing with Ajax.
    "I _____ed the tub after giving Fido a bath."
    b) Use a proper name . . . . for the act of breaking dishes, which Jonathan does regularly.
    "He's going to _____ize all of my best dishes."
    c) Use clipping . . . . for a course in ovinology (the study of sheep).
    "Have you done your _____ assignment yet?"
    d) Use derivation . . . . for being able to be contacted.
    "The counsellor is not very _____."
    e) Use a blend . . . . for a hot drink made with milk and nutmeg.
    "I'll have a _____ and two peanut butter cookies, please."

18. Determine whether the words in each of the following groups are related to one another by processes of inflection or derivation.
    a) go, goes, going, gone
    b) discover, discovery, discoverer, discoverable, discoverability
    c) lovely, lovelier, loveliest
    d) inventor, inventor's, inventors, inventors'
    e) democracy, democrat, democratic, democratize

19. The following sentences contain both derivational and inflectional affixes. Underline all of the derivational affixes and circle the inflectional affixes.
    a) The farmer's cows escaped.
    b) It was raining.
    c) Those socks are inexpensive.
    d) Jim needs the newer copy.
    e) The strongest rower continued.
    f) The pitbull has bitten the cyclist.
    g) She quickly closed the book.
    h) The alphabetization went well.