3 Types of Morphemes

3.1 ROOTS, AFFIXES, STEMS AND BASES

In the last chapter we saw that words have internal structure. This chapter introduces you to a wide range of word-building elements used to create that structure. We will start by considering roots and affixes.

3.1.1 Roots

A root is the irreducible core of a word, with absolutely nothing else attached to it. It is the part that must always be present, possibly with some modification, in the various manifestations of a lexeme. For example, *walk* is a root and it appears in the set of word-forms that instantiate the lexeme walk such as *walk, walks, walking* and *walked.*

The only situation where this is not true is when suppletion takes place (see Section 2.2.3). In that case, word-forms that represent the same morpheme do not share a common root morpheme. Thus, although both the word-forms *good* and *better* realise the lexeme good, only *good* is phonetically similar to good.

Many words contain a root standing on its own. Roots which are capable of standing independently are called **free morphemes**, for example:

[3.1] Free morphemes

man	book	tea	sweet	cook
bet	very	aardvark	pain	walk

Single words like those in [3.1] are the minimal free morphemes capable of occurring in isolation.

The free morphemes in [3.1] are also examples of **lexical morphemes**. They are nouns, adjectives, verbs, prepositions or adverbs. Such morphemes carry most of the 'semantic content' of utterances – loosely defined to cover notions like referring to individuals (for example, the nouns *John, mother*), attributing properties (for example, the adjectives *kind, clever*), describing actions, process or states (for example, the verbs *hit, write, rest*) etc., expressing relations (for example, the prepositions *in, on, under*) and describing circumstances like manner (for example, *kindly, fiercely, quickly*).

Another class of free morphemes are **function words**. These differ from lexical morphemes in that while the lexical morphemes carry most of the 'semantic content', the function words mainly (but not exclusively) signal grammatical information or logical relations in a sentence. Typical function words include the following:

[3.2] Function words

articles:	a the
demonstratives:	this that these those
pronouns:	I you we they them; my your his hers; who whom which whose, etc.
conjunctions:	and yet if but however or, etc.

Distinguishing between lexical and grammatical morphemes is normally both useful and straightforward. However, there are cases where this distinction is blurred. This is because there are free morphemes (i.e., simple words) that do not fit neatly into either category. For example, a conjunction like *though* signals a logical relationship and, at the same time, appears to have considerably more 'descriptive semantic content' than, say, the article *the*.

While only roots can be free morphemes, not all roots are free. Many roots are incapable of occurring in isolation. They always occur with some other word-building element attached to them. Such roots are called **bound morphemes**. Examples of bound morphemes are given below:

[3.3]

a.	-mit	as in	permit, remit, commit, admit
b.	-ceive	as in	perceive, receive, conceive, deceive
c.	pred-	as in	predator, predatory, predation, depredate
d.	sed-	as in	sedate, sedent, sedentary, sediment

The bound roots *-mit, -ceive, pred-* and *sed-* co-occur with forms like *de-, re-, -ate, -ment* which recur in numerous other words as prefixes or suffixes. None of these roots could occur as an independent word.

Roots tend to have a core meaning that is in some way modified by the affix, but determining meaning is sometimes tricky. Perhaps you are able to recognise the meaning 'prey' that runs through the root *pred-* in the various words in [3.3c] and perhaps you are also able to identify the meaning 'sit' in all the forms in [3.3d] which contain *sed-*.

These roots are **latinate**, that is, they came into English from Latin (often via French) but, unless you have studied Latin, you are probably unable to say that *-mit* means 'send, do' and *-ceive* means 'take' without looking up *-mit* and *-ceive* in an etymological dictionary. In present-day English, none of these meanings is recognisable. These formatives cannot be assigned a clear, constant meaning on their own.

In the last chapter, the morpheme was defined as the smallest unit of meaning or grammatical function. In the light of the foregoing discussion, the insistence on the requirement that every morpheme must have a clear, constant meaning (or grammatical function) seems too strong to some linguists. There are morphemes that lack a clear meaning. Instead, they suggest, it is the word rather than the morpheme that must always be

independently meaningful whenever it is used. As we saw in Section 2.2.1 above, the crucial thing about morphemes is not that they are independently meaningful, but that they are recognisable **distributional units** (Harris, 1951). As Aronoff (1976: 15) puts it, we can recognise a morpheme when we see a morph 'which can be connected to a linguistic entity outside that string. What is important is not its meaning, but its arbitrariness.'

The reason for treating those recurring portions of words that appear to lack a clear, constant meaning as morphs representing some morpheme is that they behave in a phonologically consistent way in the language that is different from the behaviour of morphologically unrelated but phonologically similar sequences. Take *-mit,* for example. Aronoff (1976) points out that, notwithstanding the tenuous semantic link between instances of the latinate root *-mit,* they nevertheless share a common feature which is not predictable from any properties of the phonetic sequence [mɪt]. All instances of latinate *-mit* have the allomorph [mɪʃ] or [mɪs] before the suffixes *-ion, -ory, -or, -ive,* and *-able* /*-ible,* as you can see:

[3.4]	[mIt]	[mɪʃ] before *-ion*	[mɪs] before *-ive, -ory*
	permit	permission	permissive
	submit	submission	submissive
	admit	admission	admissive
	remit	remission	remissory

By contrast, any other phonetic form [mɪt] does not undergo the same phonological modification before such suffixes. Thus, although forms like *dormitory* and *vomitory* have a [mɪt] phonetic shape preceding the suffix *-ory,* they fail to undergo the rule that changes /t/ to [s]. If that rule applied, it would incorrectly deliver **dormissory* or **vomissory,* since the same phonetic sequence [mɪt] as that in [3.4] precedes the suffix *-ory*. Clearly, the [mɪt] sequence in *vomitory* and *dormitory* is not a morph representing the latinate *-mit* morpheme. The rule that supplies the allomorph [mɪt] of verbs that contain [mɪt] is only activated where [mɪt] represents the latinate root *-mit*.

What this discussion shows is that even where the semantic basis for recognising a morpheme is shaky, there may well be distributional considerations that may save the day. Only the root *-mit* has the allomorph [mɪs]. Any word-form that displays the [mɪt]∼[mɪs] alternation in the contexts in [3.4] contains the root morpheme *-mit*.

3.1.2 Affixes

An **affix** is a morpheme that only occurs when attached to some other morpheme or morphemes such as a root or stem or base. (The latter two terms are explained in Section 3.1.3 below.) Obviously, by definition affixes

are bound morphemes. No word may contain only an affix standing on its own, like **-s* or **-ed* or **-al* or even a number of affixes strung together like **-al-s*.

There are three basic types of affixes. We will consider them in turn:

(i) Prefixes

A **prefix** is an affix attached *before* a root, stem or base, like *re-*, *un-* and *in-*:

[3.5]

re-make	un-kind	in-decent
re-read	un-tidy	in-accurate

(ii) Suffixes

A **suffix** is an affix attached *after a* root (or stem or base), like *-ly, -er, -ist, -s, -ing* and *-ed*:

[3.6]

kind-ly	wait-er	book-s	walk-ed
quick-ly	play-er	mat-s	jump-ed

(iii) Infixes

An **infix** is an affix inserted *inside* the root itself. Infixes are common in some languages, however infixing is rare in English. Sloat and Taylor (1978) suggest that the only infix that occurs in English morphology is /*-n-*/ which is inserted before the last consonant of the root in a few words of Latin origin, on what appears to be an arbitrary basis. This infix undergoes place of articulation assimilation. Thus, the root *-cub-* meaning 'lie in, on or upon' occurs without [m] before the [b] in some words containing that root, for example, *incubate, incubus, concubine* and *succubus*. But [m] is infixed before that same root in some other words like *incumbent, succumb,* and *decumbent*. This infix is a frozen historical relic from Latin. In fact, it was a frozen historical relic *in* Latin.

Infixation of sorts still happens in contemporary English, although of a rather special type. Consider the examples in [3.7a] which are gleaned from Zwicky and Pullum (1987) and those in [3.7b] taken from Bauer (1983):

[3.7]

a. Kalamazoo (place name) → alama-goddamn-zoo
   instantiate (verb) → in-fuckin-stantiate

b. kangaroo → kanga-bloody-roo
   impossible → in-fuckin-possible
   guarantee → guaran-friggin-tee

In present-day English, infixation, not of an affix morpheme but of an entire word (which may have more than one morpheme, e.g., *blood-y, fuck-ing*), is actively used to modify words. Curiously, this infixation is virtually

restricted to inserting expletives into words in expressive language that one would probably not use in polite company. Further examination reveals that there are additional, prosodic conditions on the site of insertion, and this will be discussed in more detail in Section 9.5.2.

For a case of true, morphological infixation we must look beyond English to a language such as the Native American language Nuuchahnulth, where infixation is used to indicate the plural, as in [3.8] below:

[3.8]	t'an'a	'child'	t'a<u>t</u>n'a	'children'
	haʔum	'fish'	ha<u>t</u>ʔum	'fishes'
	ɬim'aqsti	'mind'	ɬi<u>t</u>m'aqsti	'minds'
	tɬaaʔuuʔi	'the other'	tɬaa<u>t</u>ʔuuʔi	'the others'

In this case, the infixation of /-t-/ plural is employed to indicate that the noun to which the infix attaches is plural (for further discussion of the mechanics of infixation, see Chapter 9). Such cases are not uncommon in the languages of the world.

3.1.3 Roots, Stems and Bases

The **stem** is that part of a word that is in existence before any *inflectional* affixes (i.e., those affixes whose presence is required by the syntax such as markers of singular and plural number in nouns, tense in verbs etc.) have been added. Inflection is discussed in Section 3.2. For the moment a few examples should suffice:

[3.9]	<u>Noun stem</u>	<u>Plural Suffix</u>
	cat	-s
	worker	-s

In the word-form *cats,* the plural inflectional suffix *-s* is attached to the simple stem *cat,* which is a bare **root**, that is, the irreducible core of the word. In *workers*, the same inflectional *-s* suffix comes after a slightly more complex stem consisting of the root *work* plus the suffix *-er*, which is used to form agentive nouns from verbs (with the meaning 'someone who does the action designated by the verb', e.g., *singer, fighter, dancer*). Here *work* is the root, but *worker* is the stem to which *-s* is attached.

Finally, a **base** is any unit whatsoever to which affixes of any kind can be added. The affixes attached to a base may be **inflectional** affixes selected for syntactic reasons or **derivational** affixes which alter the meaning or grammatical category of the base (see Sections 3.2 and 11.2). An unadorned root like *boy* can be a base since it can have attached to it inflectional affixes like *-s* to form the plural *boys* or derivational affixes like *-ish* to turn the noun *boy* into the adjective *boyish*. In other words, all roots are bases. Bases are called stems only in the context of inflectional morphology.

Exercise
Identify the inflectional affixes, derivational affixes, roots, bases, and stems in the following:

[3.10]

faiths	frogmarched
faithfully	bookshops
unfaithful	window-cleaners
faithfulness	hardships

Hopefully, your solution is like this:

[3.11]

Inflectional affixes	Derivational affixes	Roots	Stems	Bases
-ed	un-	faith	faith	faith
-s	-ful	frog	frogmarch	faithful
	-ly	march	bookshop	frogmarch
	-er	clean	window-cleaner	bookshop
	-ness	hard	hardship	window-clean
	-ship	window		window-cleaner
				hardship

It is clear from [3.11] that it is possible to form a complex word by adding affixes to a form containing more than one root. For instance, the independent words *frog* and *march* can be joined together to form the base (a stem, to be precise) *frog-march* to which the suffix *-ed* may be added to yield *[[[frog]-[march]]-ed]*. Similarly, *window* and *clean* can be joined to form the base *[[window]-[clean]]* to which the derivational suffix *-er* can be added to produce *[[[window]-[clean]]er]*. And *[[[window]-[clean]]er]* can serve as a stem to which the inflectional plural ending *-s* is attached to give *[[[[window]-[clean]]er]s]*. A word like this, which contains more than one root, is called a **compound word** (see Section 3.4 below and Chapter 13).

3.1.4 Stem Extenders

In Section 2.3 we saw that languages sometimes have word-building elements that appear devoid of content. Such empty formatives are sometimes referred to, somewhat inappropriately, as empty morphs.

In English, empty formatives are interposed between the root, base or stem and an affix. For instance, while the highly irregular plural allomorph *-en* is attached directly to the stem *ox* to form *ox-en,* in the formation of *child-r-en* it can only be added after the stem has been extended by attaching

-r- to *child-*, yielding the bound form *childr-*. Hence, the name **stem extender** for this type of formative.

The use of stem extenders may not be entirely arbitrary. There may be a good historical reason for the use of particular stem extenders before certain affixes. To some extent, current word-formation rules reflect the history of the language, but this relationship is often opaque and inaccessible to learners.

The history of stem extender *-r-* may be instructive. A small number of nouns in Old English formed their plural by adding *-er*. The word 'child' *was cild* in the singular and *cilder* in the plural (a form that has survived in some conservative North of England dialects, and is spelled *childer)*. But later, *-er* lost its value and *-en* was added as a new plural ending, the *-er* remaining only as a stem extender:

[3.12] a.

Singular	Plural
cild 'child'	cild-er

→ b.

New Singular	Plural
cilder	cilder-en

Stem extenders are not restricted to English. Haas (1972) discusses a much more widely occurring case of stem extenders in Nuuchahnulth (also known as 'Nootka').

> The most common type of stem extender in Nootka is a single non-glottalized stop or spirant belonging to the dorsal class of either the non-labialized (k, q, x, χ, ħ) or labialized (k^w, q^w, x^w, χ^w, $ħ^w$) variety.
>
> (Haas 1972: 83)

Some examples of the use of stem extenders in Nuuchahnulth appear in [3.13]:

[3.13]

tl'atʃ	'fold, double up'	tl'atʃk	'collapsed'
tl'is	'white'	tl'isk	'flash white'
hitʃ	'illuminate'	hitʃk	'glow with a bright light'
patɬ	'flaming, lit up'	patɬk	'flare up, throw off sparks'
pit	'pinioned down'	pitq	'jammed, packed tight'
qat	'cut, slit, break'	$qatq^w$	'amputate, get amputated'

As you can see, the semantic relationship between the basic and extended forms is not obvious, although there appear to be similarities among the forms. No doubt, the vagueness is due to the time factor involved in the evolution of these forms.

3.2 INFLECTIONAL AND DERIVATIONAL MORPHEMES

As we have already hinted, morphemes can be divided into two major functional categories, namely derivational morphemes and inflectional

morphemes. This reflects a recognition of two principal word-building processes: **inflection** and **derivation**. While all morphologists accept this distinction in some form, it is nevertheless one of the most contentious issues in morphological theory. We will briefly introduce you here to the essentials of this distinction, but postpone detailed discussion until Chapter 11.

Inflectional and derivational morphemes form words in different ways. Derivational morphemes form new words either:

(i) by changing the meaning of the base to which they are attached, for example, kind vs *un-kind* (both are adjectives but with opposite meanings); *obey* vs *dis-obey* (both are verbs but with opposite meanings).

Or:

(ii) by changing the word-class that a base belongs to, for example, the addition of *-ly* to the adjectives *kind* and *simple* produces the adverbs *kind-ly* and *simp-ly*. As a rule, it is possible to derive an adverb by adding the suffix *-ly* to an adjectival base.

Exercise

Study the following data and answer the questions below:

[3.14]

I ducked	He was sheepish
two ducks	three ducklings
He is humourless	You are ducking the issue
He ducks	

(i) Identify the suffixes in the underlined words. To what word-class do the words to which the suffixes are added belong, and what word-class results?

(ii) For each suffix determine whether it is inflectional or derivational. Briefly justify your decision.

Hopefully, your answer is very close to the following:

[3.15]

	Suffix	Input	Output	Remarks
a.	-ed	V	V	inflectional: it marks past tense in *ducked*
	-s	N	N	inflectional: it marks plural number (in *(two) duck-s* and *duckling-s*)
	-s	V	V	inflectional: a portmanteau morph marking third-person, present tense and singular

	-ing	V	V	inflectional: it marks progressive aspect (i.e., incomplete action in *ducking*)
b.	-ling	N	N	derivational: it changes meaning to 'small duck'
	-ish	N	Adj	derivational: it changes word-class and meaning to 'like a sheep'
	-less	N	Adj	derivational: it turns a noun into an adjective and adds the meaning 'lacking'

Sometimes the presence of a derivational affix causes a major grammatical change, involving moving the base from one word-class into another, as in the case of *-less* which turns a noun into an adjective. In other cases, the change caused by a derivational suffix may be minor. It may merely shift a base to a different subclass within the same broader word-class. That is what happens when the suffix *-ling* is attached to *duck* above.

Further examples are given below. In [3.16a], the diminutive suffix *-let* is attached to nouns to form diminutive nouns (meaning a small something). In [3.16b], the derivational suffix *-ship* is used to change a concrete noun base into an abstract noun (meaning 'state, condition'):

[3.16] a. pig ∼ pig-let b. friend ∼ friend-ship
book ∼ book-let leader ∼ leader-ship

The tables in [3.17] and [3.18] list some common derivational prefixes and suffixes, the classes of the bases to which they can be attached and the words that are thereby formed. It will be obvious that in order to determine which morpheme a particular affix morph belongs to, it is often essential to know the base to which it attaches because the same phonological form may represent different morphemes depending on the base with which it co-occurs.

Note: These abbreviations are used in the tables below: N for noun, N (abs) for abstract noun, N (conc) for concrete noun, V for verb, Adj for adjective, and Adv for adverb.

[3.17]

Prefix	Word-class of input base	Meaning	Word-class of output word	Example
in-	Adj	'not'	Adj	in-accurate
un-	Adj	'not'	Adj	un-kind
un-	V	'reversive'	V	un-tie

dis-	V	'reversive'	V	dis-continue
dis-	N (abs)	'not'	N (abs)	dis-order
dis-	Adj	'not'	Adj	dis-honest
dis-	V	'not'	V	dis-approve
re-	V	'again	V	re-write
ex-	N	'former'	N	ex-mayor
en-	N	'put in'	V	en-cage

[3.18]

Suffix	Word-class of input base	Meaning	Word-class of output word	Example
-hood	N	'status'	N (abs)	child-hood
-ship	N	'state or condition'	N (abs)	king-ship
-ness	Adj	'quality, state or condition'	N (abs)	kind-ness
-ity	Adj	'state or condtion'	N (abs)	sincer-ity
-ment	V	'result or product of doing the action indicated by the verb'	N	govern-ment
-less	N	'without'	Adj	power-less
-ful	N	'having'	Adj	power-ful
-ic	N	'pertaining to'	Ad	democrat-ic
-al	N	'pertaining to, of the kind'	Adj	medicin-al
-al	V	'pertaining to or act of'	N (abs)	refus-al
-er	V	'agent who does what ever the verb indicates'	N	read-er
-ly	Adj	'manner'	Adv	kind-ly

To sum up the discussion so far, we have observed that derivational affixes are used to create new lexemes by either: (i) modifying significantly the meaning of the base to which they are attached, without necessarily changing its grammatical category (see *kind* and *unkind* above); or (ii) they bring about a shift in the grammatical class of a base as well as a possible change in meaning (as in the case of *hard* (Adj) and *hardship* (N (abs)); or (iii) they may cause a shift in the grammatical subclass of a word without moving it into a new word-class (as in the case of *friend* (N (conc)) and *friend-ship* (N (abs)).

Exercise
Study the data below that contain the derivational prefix *en-*.

[3.19] a.

Base	New word
cage	en-cage
large	en-large
robe	en-robe
danger	en-danger

b.

Base	New word
noble	en-noble
rich	en-rich
rage	en-rage
able	en-able

(i) State the word-classes (e.g., noun, adjective, verb, etc.) of the bases to which *en-* is prefixed.
(ii) What is the word-class of the new word resulting from the prefixation of *en-* in each case?
(iii) What is the meaning (or meanings) of *en-* in these words?

Consult a good dictionary, if you are not sure. Is there reason to regard *en-* as a homophonous morph?

You will have established that the new word resulting from the prefixation of *en-* in [3.19] is a verb. But there is a difference in the input bases. Sometimes *en-* is attached to adjectives as seen in [3.20a], and sometimes to nouns, as in [3.20b]:

[3.20] a.

Adj base	New Verb
able	en-able
large	en-large
noble	en-noble
rich	en-rich

b.

Noun base	New verb
robe	en-robe
danger	en-danger
rage	en-rage
cage	en-cage

Interestingly, this formal difference correlates with a semantic distinction. So, we conclude that there are two different prefixes here which happen to be homophonous. The *en-* in [3.20a] has a causative meaning (similar to 'make'). To *enable* is to 'make able', to *enlarge* is to 'make large', etc., while in [3.20b] *en-* can be paraphrased as 'put in or into'. To *encage* is to 'put in a cage' and to *endanger* is to 'put in danger' etc. (Notice the very special nature of *en-* in these cases – unlike most prefixes in English, which never affect the class of the form to which they attach, *en-* may change the class from adjective (e.g., *large*) or noun (e.g., *cage*) to verb.

Let us now turn to inflectional morphemes. Unlike derivational morphemes, inflectional morphemes do not change **referential** or **cognitive** meaning. We have already seen that a derivational affix like *un-* can change *kind* into *un-kind*. In this case, the derived word has a meaning which is

opposite to that of the input. The addition of an inflectional affix will not do such a thing. Furthermore, while a derivational affix may move a base into a new word-class (e.g., *kind* (adjective) but *kind-ly* (adverb)), an inflectional morpheme does not alter the word-class of the base to which it is attached. Inflectional morphemes are only able to modify the form of a word so that it can fit into a particular syntactic slot. Thus, *book* and *books* are both nouns referring to the same kind of entity. The *-s* ending merely carries information about the number of those entities. The grammar dictates that a form marked as plural (normally by suffixing *-s*) must be used when more than one entity is referred to. We must say *ten books;* **ten book* is ruled out, although the numeral ten makes it clear that more than one item is being referred to. Compare this to the situation in Hungarian, where the plural is not marked on nouns when they are specified by numbers, for example, *egy lány* 'one girl', *két fiú* 'two boys', *nyolc könyv* 'eight books', even though there are regular plural forms: *lányok* 'girls', *fiúk* 'boys', *könyvek* 'books'.

See the table in [3.21] for a sample of frequently used inflectional suffixes. English has no inflectional prefixes but some other languages do (see Luganda in [2.7]).

[3.21]

Suffix	Stem	Function	Example
-s	N	plural book-s	
-s	V	3rd person, singular, present tense	sleep-s
-ed	V	past tense	walk-ed
-ing	V	progressive (incomplete action)	walk-ing
-er	Adj	comparative degree	tall-er
-est	Adj	superlative degree	tall-est

Exercise

Below, an additional inflectional suffix is presented. What is this suffix called and what is its function in each example?

[3.22] a. Janet's book
b. The Winter's Tale
c. in two days' time

The *-s* in [3.22] is sometimes called the **genitive suffix**. Quirk and Greenbaum (1973) list these, among others, as the uses of the genitive suffix in English:

(i) marking the noun referring to the possessor of something (as in *Janet's book*),
(ii) marking a noun that describes something (as in *The Winter's Tale*),
(iii) marking a noun used as a measure (*in two days' time*).

In fact, there is good reason to treat this morpheme as something other than a suffix. We will return to this and refine our analysis of genitive *-s* in Section 11.5.

3.3 MULTIPLE AFFIXATION

What we are now going to explore are some of the ways in which complex words are formed by creating bases that contain several derivational morphemes. Let us take the root *-dict-* meaning 'speak, say' which is found in *diction, dictate, dictatorial, contradict, benediction,* etc. Starting with *-dict-*, we can form complex words such as *contradictory* and *contradictoriness* by attaching several affixes to the root, that is, we can have multiple affixation. This process can take place in a number of rounds, with the output created by one round of affixation serving as the input to a later round:

[3.23]

Root	-dict$_{V}$	Output	
base:	-dict$_{V}$	(round one: prefixation: add *contra-*$_{Preposition}$)	→ *contradict*$_{S}$
base:	contradict$_{V}$	(round two: first suffixation: add *-ory*$_{Adj}$	→ *contradict-ory*$_{Adj}$
base:	contradictory$_{Adj}$	(round three: second suffixation: add *-ness*$_{N}$	→ *contradictoriness*$_{N}$

Words may have multiple affixes either with different suffixes appearing in a sequence as in [3.23] or with the same prefix recurring as below in [3.24]:

[3.24] a. the latest re-re-re-make of *Beau Geste*.
b. the great-great-great-great grandson of the last Tsar of Russia.

What [3.24] shows is that, with a limited number of morphemes, morphological prefixation rules can apply recursively in English (see Section 1.3). However, **performance** difficulties in working out what exactly *great-great-great-great grandson* or *re-re-re-make* means do severely restrict the chances of such words being used. But the point is that the grammar cannot exclude them as ill-formed. Recursive rules are one of the devices that make morphology open-ended. They make possible the creation of new words with the same morphemes being used over and over (cf. Section 4.1).

Re-attaching the same morpheme again and again is permitted, but unusual. What is common is multiple affixation of different affixes. It is such affixation that we will concentrate on. We have already seen an example of it in *contra-dict-ori-ness* in [3.23].

Exercise
Take the free base *nation* and add to it as many prefixes and suffixes as you can. Attempt to go through at least four rounds of affixation.

Hopefully, you have come up with something like this:

[3.25] nation
nation-al
national-ise
de-nationalise
denationalis-at-ion (but there is no *denationalisate)
anti-denationalisation
pre-antidenationalisation

Observe that where several prefixes or suffixes occur in a word, their place in the sequence is normally rigidly fixed, whereas there is usually some scope for rearranging words in different orders in sentences, as you can see:

[3.26]

a. You can play badminton.
Can you play badminton?

b. What I need is a nice cup of tea.
A nice cup of tea is what I need.

There is virtually no possibility of rearranging morphemes within a word, other than in compounding, to be discussed below. So, for example, the morphemes in *de-nation-al-ise* must appear in that order. Rearranging the affixes produces ill-formed strings like **ise-nation-de-al-* or **al-ise-nation-de*. The main problem and interest, as we will see in Section 6.2.1, is determining the order of derivational affixes where several of them occur in a word.

3.4 COMPOUNDING

As we briefly saw in Section 3.1.3, a **compound word** contains at least two bases that are both words, or at any rate, root morphemes.

Exercise
Analyse the following compounds into their constituent elements: *teapot, week-end, hairdresser, kind-hearted.*

We expect you to have worked out an answer close to the following:

[3.27] a. $[\text{tea}]_N\ [\text{pot}]_N \rightarrow [\text{teapot}]_N$
$[\text{week}]_N[\text{end}]_N \rightarrow [\text{week-end}]_N$
b $[\text{hair}]_N\ [[\text{dress}]_V\ \text{-er}]_N \rightarrow [\text{hairdresser}]_N$
$[\text{kind}]_A\ [[\text{heart}]_N\ \text{-ed}]_A \rightarrow [\text{kind-hearted}]_A$

Compounding is a very important way of adding to the word stock of English, as we will see. Sometimes it is bare roots that are combined in compounds, as in [3.27a], and sometimes an input base contains an affixed form as in [3.27b]. Notice that compounds may contain elements in different orders, with consequent differences in meaning, for example, *arm-chair* vs. *chair-arm*. We will discuss compounds briefly again in the next chapter and return to them in greater detail in Chapter 13.

3.5 CONVERSION

We have seen that complex words may be formed either by compounding or by affixation, or by a combination of the two. We are going to see now that there is an alternative word-formation strategy which is commonly used in English. Words may be formed without modifying the form of the input word that serves as the base. Thus, *head* can be a noun or verb. This is called **conversion**.

Exercise
How do you know whether *head* is a noun or verb in the following?

[3.28] a. The head of the village school has arrived.
The heads of the village schools have arrived.

b. She will head the village school.
She headed that school.

It is partly the morphological structure, and partly the syntactic position that the word occupies that tells you whether it is a noun or a verb. From a syntactic point of view, we know that in [3.28a] *the head* is a noun phrase. The key word in a noun phrase must be a noun. As *head* occurs following *the* and is the key word in this construction, *head*, must be a noun. But from a morphological point of view, we cannot tell whether *head* is a noun or verb when it occurs with no affixes. However, in the case of *heads,* the presence of the *-s* morph that here realises the plural in nouns gives us a useful clue.

By contrast, in [3.28b] *head* must be a verb. It comes after the auxiliary verb *will* in a slot that is typically filled by verbs. In the second example, *head* has attached to it the *-ed* morph representing the past tense morpheme that is only found in verbs. Furthermore, from a syntactic point of view, we know that *she* is the subject and *that school* is the object. The sentence must also have a verb. The verb occurs between the subject and the object. (The order of sentence constituents in English is Subject Verb Object.) So, *headed* must be the verb, since it occurs between the subject and the object.

Conversion is also referred to as **zero derivation** in the literature (cf. Marchand, 1969; Adams, 1973) and is subsumed under affixation, by analogy to zero affixation in inflectional morphology (cf. Section 2.3). It is claimed that zero morphs (i.e., ones lacking any overt marking) are used as suffixes in derivational morphology as well. For instance, the verb *head* is derived by suffixing a zero morph to the noun *head*. This is done by analogy to the derivation of a verb like *victim-ise*$_{V}$ (from the noun *victim*$_{N}$ where the overt verb-forming suffix *-ise* is used).

The use of zero in derivational morphology is controversial. Since neither the original noun *head,* nor the derived verb *head,* has an overt suffix, if we assume that zero suffixation takes place here, we end up with a somewhat absurd situation where a zero suffix on the noun is said to contrast with a zero suffix on the derived verb. It is more prudent to recognise conversion as a distinct word-forming mechanism and to restrict the use of zero morphs as much as possible. See Section 6.2.3 for further discussion.

3.6 MORPHOLOGICAL HAPLOLOGY

Stemberger (1981) discusses the phenomenon of morphological haplology. **Haplology** refers to the deletion of one of an identical pair of elements. In the case of morphological haplology, these elements constitute identical morphs belonging to distinct morphemes. The examples in [3.29] illustrate the case. In [3.29a] we have examples of the plural attached to nouns, [3.29b] shows the same nouns with the possessive marker and [3.29c] illustrates the case of both the plural and the possessive co-occurring. Finally, [3.29d] provides examples of irregular plurals combined with the plural, demonstrating that this is not a constraint against the co-occurrence of the morphemes:

[3.29]

a.	the cats	the dogs	the churches
	[kæts]	[dagz]	[tʃɜ:tʃəz]
b.	the cat's ears	the dog's paws	the church's windows
	[kæts]	[dagz]	[tʃɜ:tʃəz]
c.	the cats' ears	the dogs' paws	the churches' windows
	[kæts]	[dagz]	[tʃɜ:tʃəz]
d.	the oxen's ears	the mice's paws	the children's toys
	[aksenz]	[maɪsəz]	[tʃɪldɹənz]

As can be seen by these examples, the attachment of two identical morphs representing distinct morphemes, plural and possessive, involves the merger of the phonological content of the two morphs, resulting in a certain degree of ambiguity in the cases in [3.29c]. Note that the ambiguity does not arise in the cases in [3.29d], since the irregular plural has a different phonological shape from the possessive.

3.7 MORPHOLOGICAL TYPOLOGY

We suggested in the opening chapter that although languages vary enormously in their structure they nonetheless show surprising similarities. The study of the significant shared structural properties which languages have in common is the domain of **language universals**. Many of the universals are abstract principles of **Universal Grammar** that determine the properties of rules that grammars of individual languages may have (e.g., the Strict Cycle Condition discussed in Section 6.2.4).

An integral part of the study of universals in language is the study of differences between languages. This might look odd to begin with. But it turns out that differences between the structural patterns found in different languages appear to occur within a fairly restricted range. There are parameters within which most differences between languages occur. Just as tram lines determine where trams can go in a city (while leaving them plenty of options), pre-set parameters determine the structural patterns from which different languages may select.

Structural patterns are not randomly distributed. There are a number of strongly preferred patterns that recur in language after language, while other patterns are rare, or non-existent (Greenberg, 1963; Comrie, 1989; and especially Chomsky, 1986). The study of the range of patterns within which languages may vary is the domain of **language typology**.

Our concern in this book is with both the similarities and differences between languages in the ways in which they form words. On the basis of typical patterns of word-formation, linguists recognise five broad morphological types:

(i) **analytic** (also called **isolating**) languages;
(ii) **agglutinating** (also called **agglutinative**) languages;
(iii) **inflecting** (also called **synthetic** or **fusional**) languages;
(iv) **polysynthetic** (sometimes called **incorporating**) languages;
(v) **templatic** languages.

We will now consider the morphological types in turn, starting with examples of analytic morphology from Chinese:

[3.30] a. tā bǎ shū mǎi le.
he *OM* book buy-*Asp*.
'He bought the book.'

b. tā chǎo le yí ge cài hěn xiāng.
he cook -*Asp*. one-classifier dish very delicious.
'He cooked a dish that was very delicious.'

Note: *Asp*. is short for 'perfective aspect'. It indicates that an action is completed. *OM* is short for 'object marker', i.e., the morpheme that indicates the object of the verb (data from Li and Thompson, 1978).

As you can see from the morpheme-by-morpheme translation, in Chinese bound morphemes are infrequent, just as the English translation demonstrates the same property for English. Often the words are bare, unaffixed root morphemes or compounds of such roots.

Chinese is an example of an analytic language, that is, a language where each morpheme may occur as a word in isolation. Words virtually never have inflectional affixes, although they may bear aspect marking. Thus, the object marker *bǎ* may be viewed as an independent word. By contrast, in other language types, object markers are normally inflectional affixes that are part of a noun or pronoun. In English the subject pronoun *he* contrasts with the object pronoun *him* in *He saw Lauren* vs *Lauren saw him*. The change from *he* to *him* in the pronoun marks the change in grammatical function. Similarly, in English, markers of aspect and tense are usually inflectional affixes of the verb such as *-ed*, as in *cook-ed* (vs *cook*). Similarly, in Chinese, in [3.30b] the aspectual morpheme is realised by a bound morpheme, *le*. (Note in passing that there are many Chinese words containing more than one morpheme. Usually they are compounds like *jue-she* (literally 'chew-tongue') 'gossip' (noun), *zhen-tou* ('rest-head') 'pillow', *piao-liang* (pretty-luminous) 'beautiful', and *cong-ming* (clever-understand) 'intelligent'.)

Exercise
Let us now turn to another language, Turkish.

[3.31]

el	'the hand'	elimde	'in my hand'
elim	'my hand'	ellerim	'my hands'
eler	'the hands'	ellerimde	'in my hands'

(i) Divide the words above into morphs and assign each morph to a morpheme.
(ii) How do the morphs match up with morphemes?

Your answer to the first question should be: *el* 'hand', *-im* 'my' (genitive), *-ler* 'plural' and *-de* 'in'.

Turkish is a classic example of an agglutinating language. In this kind of language there tends to be a more or less one-to-one matching of morphemes with morphs:

[3.32]

Morpheme:	'hand'	PLURAL	1st PERSON POSSESSIVE		'in'
Morph:	el	ler	im		de

The Luganda words in the last chapter have already introduced you to another example of such a language. The word *tulilaba* 'we will see', for instance, is analysable as *tu-* 'we', *-li-* 'future', and *-laba* 'see'.

Exercise

Now explain why any attempt to treat Latin as we have treated Turkish would fail. Show why it is impossible to isolate separate morphs representing the morphemes in the following Latin words:

[3.33]

	Singular	Plural	
Nominative:	mēnsa	mēnsa	'table (Subject)'
Genitive:	mēnsæ	mēnsārum	'of the table'
Ablative	mēnsa	mēnsīs	'from the table'

It would be futile to try matching morphs with morphemes. How could one say, for instance, which part of the suffix -Q represents plural and which part represents nominative? How could one tell which part of the suffix -is represents plural and which part represents ablative ('from') in the word *mēnsis*? And so on. Here we see an unsegmentable morph representing simultaneously the plural and nominative morphemes, the plural and ablative morphemes, etc. See Section 3.7 for further discussion.

Latin is a good example of an inflecting language. Words usually consist of several morphemes, but there is seldom a one-to-one matching of morphemes with morphs. Instead, a single morph is likely to represent several morphemes simultaneously. Other well-known representatives of this type of language include Sanskrit and Greek.

Now look at the following analysis of the Greenlandic words *illuminiippuq* and *tuttusivuq* from Fortescue (1984):

[3.34] a.

illu-	mi-	niip-	puq	
house	his	be-in	3rd person-singular-indicative	
'he is in his (own) house'				

b. tuttu- si- vuq
caribou come-across 3rd person-singular-indicative
'he saw (a) caribou'

Greenlandic is a typical **polysynthetic language**. You can express in Greenlandic in one word (e.g., *tuttusivuq*), which may include a verb and its object, what is said using a whole sentence containing several words in English (or Chinese). Greenlandic is a language with long words (e.g., *illuminiippuq*) that tend to involve very extensive agglutination and inflection.

It is important to note that the terms incorporation and polysynthesis are not exactly the same. Comrie (1989: 45) has the following to say about the difference between polysynthesis and incorporation:

> Although these two terms [i.e., polysynthesis and incorporation] are sometimes used interchangeably, it is possible and advisable to make a distinction between them. Incorporation refers to the possibility of taking a number of lexical morphemes and combining them together into a single word .... Polysynthesis, however, refers simply to the fact that, in a language of this type, it is possible to combine a large number of morphemes, be they lexical or grammatical, into a single word ... We thus see that incorporation is a special case of polysynthesis.

Many Native American and Australian languages are incorporating. Gerdts (1998: 84) states the following with respect to incorporation:

> Incorporation is the compounding of a word (typically a verb or preposition) with another element (typically a noun, pronoun, or adverb). The compound serves the combined syntactic function of both elements.

As we will see in Section 12.7, recent studies have highlighted this language type because it raises interesting questions about the relationship between morphology and syntax. In incorporating languages the distinction between morphology, the study of word structure, and syntax, the study of sentence structure, is blurred. Some processes which elsewhere happen at the level of the sentence take place within the word.

Traditional typology neglected the morphological process of **templatic morphology**, typical of Semitic languages like Arabic and Hebrew. Much of Semitic derivation involves the use of **templates**, or **binyanim**, that interlace vowels in a root that consists entirely of consonants.

Thus, in Egyptian Arabic the three-consonant root *ktb* means 'write'. It provides the skeleton that is fleshed out with a variety of vowels in the formation of word-forms which belong to the lexeme ktb, such as:

[3.35] kitab 'book'
katab 'he wrote'
katib 'writer'

This process also occurs in a number of Native American languages, such as Yokuts and Miwok (Archangeli, 1983, Freeland, 1951). The description of this kind of morphological pattern has been the subject of very fruitful investigations recently, as we will see in Chapter 9.

Exercise

Use the opening sentence of *Moby Dick* to formulate a tentative hypothesis about English. Is it an isolating, inflecting, agglutinating or incorporating language?

[3.36] Call me Ishmael. Some years ago – never mind how long precisely – having little or no money in my purse, and nothing in particular to interest me on shore, I thought I would sail about a little and see the watery part of the world.

(Herman Melville, *Moby Dick*)

English is predominantly isolating, like Chinese. The vast majority of the 45 words in this sentence, which is typical of modern English, are simple. They contain just one morpheme. However, English is not a thoroughbred isolating language. Four of the words, namely *year-s, precise-ly, hav-ing* and *water-y* contain two morphs representing two distinct morphemes. These words exemplify a degree of agglutination. In addition, there are also several words containing one morph which represents several morphemes concurrently, for example, *me* (1st person, singular, accusative pronoun); *my* (1st person, singular, possessive pronoun), *I* (1st person, singular, nominative pronoun), *thought* (THINK, past) and *would* (WILL, past). In words like this, trying to designate a portion of the word as a morph representing one of the morphemes would be futile. Such words show that, to a certain extent, English is a synthetic language. Even infixation (which is not exemplified by [3.36]) is found occasionally in English, as in *incumbent, succumb* and *decumbent,* where *-m-* is infixed in the root *-cub-* (see Section 3.1.2), although this is not an active process and wasn't even in Latin from where these words come.

Greenberg (1954) made a proposal regarding *typology* that is widely accepted. He suggested that the number of morphemes in a representative sample of sentences should be divided by the number of words to work out the ratio of morphemes to words in a language. The result should form the basis of our typological classification:

(i) If a language has between 1.00 and 1.99 morphemes per word it is **analytic** (isolating). With 1.68 morphemes per word in Greenberg's sample of sentences, English falls in the essentially isolating category. (It is similar to Chinese – see [3.30].)

(ii) A language averaging between 2.00 and 2.99 morphemes per word is **synthetic** (inflecting) if the realisation of the different morphemes tends to be simultaneous (as in Latin – see [3.31]).
(iii) A language averaging between 2.00 and 2.99 morphemes per word is *agglutinative* if each morpheme tends to be realised by a separate morph (as in Turkish in [3.31]).
(iv) A language is **polysynthetic** if it averages 3.00 morphemes per word or more (e.g., Greenlandic – see [3.34]).

It is important to realise that probably no language has an unalloyed analytic, agglutinating, inflecting or polysynthetic morphological system. All that the classification attempts to do is reflect the dominant tendencies found in a particular language.

3.8 WP AND THE CENTRALITY OF THE WORD

A central question which morphological theory needs to address is 'what is the key unit which morphological theory deals with?' In structuralist morphology the answer was unequivocally 'the morpheme'. However, in recent years, various scholars have proposed that it is not the morpheme but rather the word that should be regarded as the central unit of morphological analysis. This debate has important repercussions for how we formulate our theory of morphology and the lexicon.

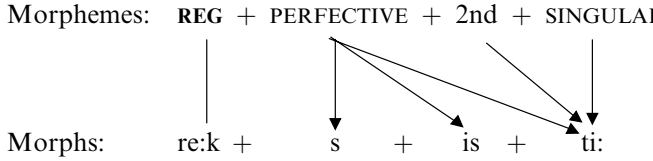
Word-and-paradigm morphology (WP) is one theory that puts the word at the centre. It was first mentioned in modern linguistics by Hockett (1954) who identified it as the approach assumed in traditional grammars based on Latin. This model was articulated in Robins (1959) and extensively revised by Matthews (1972). It has since been elaborated by Anderson (1977, 1982, 1984, 1988a) in what is often referred to as the Extended Word and Paradigm (EWP) model. However, in spite of its inherent merits, this approach has not been adopted by many linguists.

Although there are not many WP morphologists at present, the critique of morpheme-based approaches to morphology that this theory embodies has contributed to a healthy re-examination of the nature of morphological representations in recent years. WP is critical of the somewhat naive view of the relationship between morphological representations and morphs found in some structuralist models of morphology. Matthews (1972) has shown that a theory of the morpheme that relies on the assumption that morphemes are always typified by a one-to-one pairing of morphemes with morphs is misguided. True, in straightforward cases of agglutination like the Turkish example in [3.32]), a bit of the phonological representation may directly correspond to a bit of the morphological representation, but the phenomenon of portmanteau morphs that is found frequently in

inflecting languages illustrates the difficulties that arise if morphemes are assumed to be always matched in a straightforward way with morphs.

Matthews (1972: 132) suggests that the Latin word /re:ksisti:/ 'you (sg.) ruled (or I have ruled)' could be analysed as in [3.37]:

[3.37]



The morphemes SECOND PERSON and SINGULAR are both realised by the portmanteau morph *-ti:* while the perfective is multiply signalled, partly in the selection of *rek-* (see below) and by the suffixes *-s-*, *-is-* and *-ti:*. The justification for this analysis will be clear if you compare parts of the perfect and imperfect forms of the verb *regere* 'rule':

[3.38]

Imperfect		Perfect	
rege:bam	'I was ruling'	re:ksi:	'I have ruled'
rege:ba:s	'you (sg.) were ruling'	re:ksisti:	'you (sg.) have ruled
rege:bat	'he was ruling'	re:ksit	'she/he has ruled'

If you examine the second person singular forms, for example, you observe that the root reg- has the phonological realisation /reg-/ in the imperfect but /rek-/ in the perfective. So, the distinction between perfective and imperfective is in part realised in the root itself (see the diagram in [3.37]). The ending /-ti:/ marks SECOND-PERSON singular if the grammatical representation also includes the perfective. If the verb is in the imperfective, the SECOND-PERSON SINGULAR is marked instead by /-a:s/. The crucial point is that these various morphs do not have a clear identifiable meaning on their own. They can only be interpreted in the wider context of the word as a whole of which they form a part. To know how SECOND-PERSON SINGULAR is going to be realised, we need to take into account the rest of the grammatical representation manifested in a particular word. A sensible solution, and one that WP morphology advocates, is one that recognises a combination of morphs as simultaneously signalling a particular meaning if they co-occur in a word that has a certain combination of grammatical properties.

We will not introduce you to the formalism of WP because that formalism is not important for the generative theory of morphology outlined here. If you wish to see WP rules, turn to Matthews (1972), Anderson (1982) or Bauer (2003). The aim here has been to show that, while morphemes are important theoretical entities, the word is the key unit of morphological representation. While still recognising the relevance of morphemes, present-day morphological theory in generative grammar is word-based. The pivotal role of the word will become especially obvious in Part II of the book.

EXERCISES

1. Examine carefully the following sentence:

> Mr Nickleby shook his head, and motioning them all out of the room, embraced his wife and children, and having pressed them by turns to his languidly beating heart, sunk exhausted on his pillow.
> (Charles Dickens, *Nicholas Nickleby*)

   (a) List five free and three bound morphemes that occur in this sentence.
   (b) List three functional morphemes in the sentence.

2.

nilipata	'I got'	niliwapiga	'I hit them'
walipata	'they got'	walitupiga	'they hit us'
nilipiga	'I hit'	walikipiga	'they hit it'
nilikipata	'I got it'	utatupiga	'you will hit us'
ulikipata	'you got it'	ulipata	'you got'
nitakipata	'I will get it'	watakupiga	'they will hit you'
ulipiga	'you hit'	ulitupiga	'you hit us'
watakipiga	'they will hit it'	nitakupata	'I will get you'

   Note: Here the form 'hit' as in 'you hit' represents the past tense form of the verb *hit* and 'you' stands for 'second-person singular'.

   (a) Identify the morphemes in the Swahili words above, distinguishing between roots and affixes.
   (b) State the meaning of each morpheme.
   (c) State whether the affix morphemes are: (i) prefixes or suffixes, and (ii) inflectional or derivational.
   (d) On the basis of these data, would you classify Swahili as an isolating, agglutinating, synthetic or incorporating language?

3.

Present tense		Pluperfect	
regō	'I rule'	rēkseram	'I had ruled'
regis	'you (sing.) rule'	rēkserās	'you (sing.) had ruled'
regit	's/he rules'	rēkserat	's/he had ruled'
regimus	'we rule'	rēkserāmus	'we had ruled'
regitis	'you (pl.) rule'	rēkserātis	'you (pl.) had ruled'
regunt	'they rule'	rēkserant	'they had ruled'

Future simple	
regam	'I shall rule'
regēs	'you (sing.) shall rule'
reget	's/he will rule'
regēmus	'we will rule'

regētis	'you (pl.) will rule'
regent	'they will rule'

(a) Make a morphological analysis of the Latin data above:
(b) Referring to your analysis, highlight the pitfalls of a theory of word-structure that assumes that there is always a one-to-one matching of morphs with morphemes.

4.

àzɔ̄	'long'	àzɔ̀	'to become long'
ìn̪dá	'good'	ìn̪dà	'to become good'
ōsú	'good'	ōsù	'to become good'
álí	'deep'	álì	'to become deep'
àkēlí	'red'	àkèlì	'to become red'
áfɔ́rɔ̀	'yellow'	áfɔ̀rɔ̀	'to become yellow'

(a) What is the morphological function of tone in the Lulubo words above?
(b) State exactly how tone is used to perform this function.
(c) Explain whether or not Lulubo fits in the morphological typology given in this chapter (data from Andersen, 1987).