3 The structure of words: morphology

3.1 Introduction

Knowing words is such an intrinsic part of our knowledge of a language that we often do not consciously think about how words are created or structured. However, once we take a closer look at words, many questions arise. For instance, what elements does the word *antiglobalisation* consist of? And can we subdivide the word *step* into any further parts? In general, how can we analyse the structure of words? Besides, we might ask why some words, such as *dishonest*, are attested in English, whereas other words, such as *honestdis* or *discar* are unattested. In other words, are there any rules that determine possible and impossible combinations of elements within words? Another array of questions we might be interested in when dealing with words is how we can create new words whenever we need a name for a new object, person, or process. Imagine, for instance, that you need a word to describe the process of removing old shelves from your flat. What word would you use to refer to this process? *Unshelfing*, *shelf-removing*, or something else?

There is a special sub-discipline of linguistics that deals with all these questions, **morphology**, which is the study of the internal structure of words, the rules that govern it, as well as the ways of creating new words. Interestingly, the term 'morphology' is originally not a linguistic term. It was invented by Johann Wolfgang von Goethe to designate the study of the structure of living organisms. Linguists borrowed it from biologists in the nineteenth century and used it to denote the study of linguistic 'organisms': words.

In the present chapter we will learn the basic notions necessary for the morphological analysis of words and take a closer look at different morphological phenomena.

3.2 Minimal building blocks: morphemes

We have mentioned above that morphology deals with the internal structure of words. But how can we analyse this internal structure? And what are the elements words can consist of? We will deal with these questions below.

If we asked you to determine intuitively the structure of the word *dreamless*, you most likely would say that it consists of two parts, *dream* and *-less*. But what

about *dream*? Again, quite intuitively, you would say that this word cannot be subdivided into further parts. But why not? Why don't we say, for instance, that the word *dream* can be subdivided in the following way:

(1) [d-ɹ-i:-m]

We might say that the subdivision in (1) deals with sounds, and therefore is of interest for phonology or phonetics, but not for morphology. Indeed, we should not confuse the morphological structure of words with their phonetic or phonological structure. But what is the difference between morphological and phonological or phonetic structure? This will become clear if you compare the division you made for *dreamless* and the division in (1). You will agree that the two analyses are fundamentally different. But why? The matter is that the elements *dream* and *-less* are meaningful, i.e. they have a certain meaning. For instance, *dream* means 'a series of images appearing in the mind during sleep' and *-less* means 'without'. By contrast, the separate sounds [d], [ɹ], [i:] and [m] do not have any meaning. Remarkably, the same holds for any other subdivision of this word, as the examples in (2) show.

(2) a. [dɹi:-m]
    b. [dɹ-i:-m]
    c. [dɹ-i:m]

Obviously, even the sound combinations in (2) cannot be regarded as meaningful units. Indeed, in the word *dream* only the whole unit, [dɹi:m], has a meaning, 'a series of images appearing in the mind during sleep'. We can say that morphology deals with the analysis of words into meaningful units.

The generalisation that emerges from the discussion above is that words can be analysed into meaningful units. Such meaningful units are called **morphemes**. Another important generalisation we can make is that since sounds or even combinations of sounds in the word *dream* are not meaningful units, *dream* cannot be subdivided any further into meaningful parts. This means that *dream* is the smallest meaningful unit in the word *dream*. So we should elaborate our definition of morpheme by saying that a 'morpheme' is the smallest meaningful unit.

Finally, our discussion leads us to yet another insight. Consider what happens to the word *dream* if you remove a part of it. For instance, if you remove [dɹ], you get [i:m], which is meaningless, because it is only the whole sequence [dɹi:m] that carries meaning and is therefore a morpheme. We can conclude that a word must consist of at least one morpheme, there are no 'morphemeless' words.

The question that arises next is how we can identify which part in a word is meaningful and what meaning it has. Consider the word *shyness*. How can we establish what meaningful units it consists of? We know that there is the word *shy* in English, and we can check what it means in a dictionary, for instance in the *Longman Dictionary of Contemporary English*: 'nervous and embarrassed about meeting and speaking to other people'. So we can say that *shy* in *shyness* is a meaningful unit and therefore a morpheme. But what about *-ness*? There is no such word as *ness* in English. However, it may come to your mind that there are many words in English that contain the unit *-ness*, such as *sadness*, *loudness*, *boldness*, *happiness*, etc. We can assume that since this unit occurs in quite a number of words, it might be a morpheme. To verify this, we should find out whether it has any meaning. How can we do this? We can paraphrase different words containing *-ness* to see whether *-ness* contributes any meaning to the overall meaning of these words. To find this out, we should do the paraphrase by using the words to which *-ness* is attached, because then the remaining part of the paraphrase would be the meaning of *-ness*. Such paraphrases are shown in (3):

(3) shyness 'the state or property of being shy'
loudness 'the state or property of being loud'
sadness 'the state or property of being sad'
happiness 'the state or property of being happy'

As the data in (3) show, the meaning of *-ness* is 'the state or property of being X', where 'X' stands for the meaning of the word it is attached to. Therefore, *-ness* is a morpheme in the data in (3). Note that another property of morphemes that we found in *dream* also holds for the morpheme *-ness*: It cannot be subdivided any further into meaningful components. If we divide this morpheme into [n] and [əs], for instance, these parts do not carry any meaning.

We can now make another important generalisation. If we compare the words *dream* and *dreamless*, or *shy* and *shyness*, we can say that the words *dream* and *shy* consist of only one morpheme, whereas the words *dreamless* and *shyness* consist of more than one morpheme. Words consisting of only one morpheme are called **monomorphemic** or **simplex words**, those that contain two and more morphemes are called **polymorphemic** or **complex words**.

So far the identification of morphemes and the analysis of words into morphemes presented little difficulty. Sometimes, however, this analysis is not equally straightforward. Consider the element *cran-* in *cranberry*. This element cannot stand alone in English, it occurs only in combination with the morpheme *berry*. Moreover, it is attested only in this one word. If you consult a dictionary for this element, you will most likely find no entry for it. To identify its meaning we

cannot apply the method we used above, i.e. finding other words with the same element, because the element occurs in one English word only. However, we can use a similar strategy. We can try to collect other words containing the element *berry* in order to see how the meaning of *cranberry* differs from the meanings of other words denoting berries:

(4) cranberry 'berry which is red and sour'
strawberry 'berry which is red, soft and has tiny seeds on its surface'
blackberry 'berry which is black or purple and grows on a thorny bush'
blueberry 'berry which is blue'

In contrast to *strawberry*, *blackberry*, or *blueberry*, *cranberry* denotes a 'red sour' berry, and not a 'red soft' or a 'black/purple' or a 'blue' berry. We can say therefore that the meaning of *cran-* is what makes 'cranberry' different from 'strawberry' or 'blackberry', i.e. that it is a 'red sour', and not a 'red soft' or 'black' berry. This difference in meaning must then be the meaning of *cran* in *cranberry*. To summarise, despite the fact that *cran-* does not occur independently in English, and also despite the fact that it occurs in only one English word, we are able to ascribe a meaning to it and thus to regard it as a morpheme. Such morphemes are called **unique morphemes** because of their sole occurrence in only one word of a language.

Now consider the data in (5) and decide whether the words in (5) consist of one or of two morphemes.

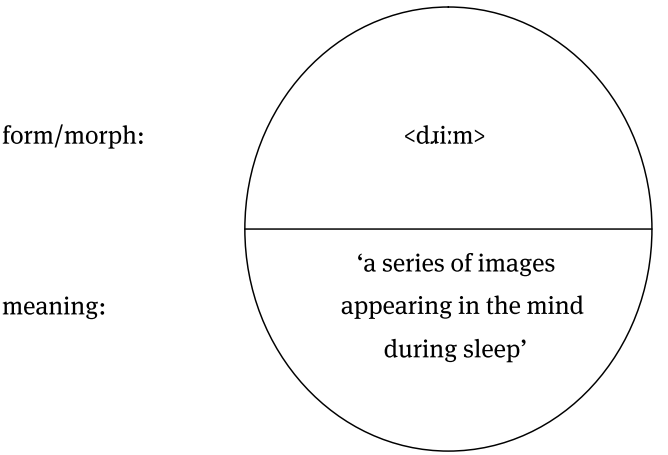
(5) sustain 'to keep something going'
pertain 'to relate to something'
contain 'to have inside'
obtain 'to get or achieve something'

At first sight, you might identify the element *tain* in the words above as a morpheme, since it surfaces consistently in a number of words, similarly to the morpheme *-ness* above. To support this hypothesis, we should be able to prove that the element *tain* has a certain meaning. If you know Latin you would possibly suggest that *tain* comes from Latin *tenere* and has the same meaning as in Latin, namely, 'to hold', and that the words in (5) are therefore complex. However, the average native speaker of English might not have this etymological knowledge. Besides, if we compare the paraphrases of the words in (5), they do not follow the same pattern as it was the case with the morphemes *-less* and *-ness* above. In other words, the meaning 'hold' is not readily traceable. In fact, it is unclear from the point of view of today's English, what the meaning of *tain* in these

words might be. This means that although etymologically the words in (5) are complex, they are simplex in contemporary English. In general, we can conclude that when we do morphological analysis, morphology should not be confused with etymology.

So far we have assumed that morphemes have a certain meaning. But is meaning the only thing necessary for the identification of morphemes? Let us go back to our example of the morpheme *dream*. When you identified its meaning, how did you know that we were dealing with the morpheme *dream* and not *harm*, or *cake*, or *connect*? Definitely because you had access to the word's orthographic form (i.e. the way it is written): <dream>, and its phonetic form (i.e. the way it is pronounced): [dɹiːm]. In a similar way, you were able to discuss the meaning of *-ness* in *shyness* because it has a certain orthographic and phonetic form: <ness> and [nəs], respectively. In fact, meaning is something abstract: You cannot see or feel it, and we can generally access it only if it materialises in a certain 'physical' form. We can conclude that, usually, a morpheme has a certain form and a certain meaning. Note that the general term used in morphology to refer to the form is **morph**. We will use both terms, morph and form, throughout this chapter. The relation between morph/form, meaning and morpheme is depicted in (6):

(6) The morpheme *dream*



Identifying the form might seem to be fairly unproblematic for morphemes such as *dream* or *-less*, but less straightforward in other cases. We have seen some of such cases above, for instance *cran-* and *-tain*, and will now deal with yet another problematic case. Consider the data in (7) and think about whether the plural

forms *teeth*, *geese*, *mice* consist of one or of two morphemes. To answer this question concentrate on the meaning of the plural forms:

(7)	tooth	[tuːθ]	teeth	[tiːθ]	'more than one tooth'
	goose	[guːs]	geese	[giːs]	'more than one goose'
	mouse	[maʊs]	mice	[maɪs]	'more than one mouse'

As the paraphrases show, the meanings of the words *teeth*, *geese*, and *mice* actually all contain two meanings: the basic meanings 'tooth', 'goose', 'mouse' and the meaning 'more than one'. We might therefore assume that the words *teeth*, *geese* and *mice* consist of two morphemes: the morphemes *tooth, goose* and *mouse*, and the morpheme with the meaning 'more than one'. But what is the form of this morpheme? As you know, in most English words the plural meaning, i.e. the meaning 'more than one', is created by adding a form, i.e. *-s* as in *dogs*, *beds*, *ideas*. In contrast, nothing is added in the examples in (7). What we see instead is that *teeth* is related to *tooth*, and *geese* to *goose*, by changing the vowel from [uː] to [iː]. In the pair *mouse-mice*, we observe a change from [aʊ] to [aɪ]. Thus, the plural meaning is not expressed by adding some form, but by a change in the vowel. The technical term for this type of process is **vowel change**, or **vowel alternation**.

The English word *sheep* also presents a puzzle for identifying the plural form. The plural of this word is created without any change in form: *one sheep* vs. *many sheep*. However, by analogy to the example *tooth-teeth* above, we know that in *many sheep* the word *sheep* should be analysed as consisting of two morphemes: one morpheme meaning 'a farm animal that has thick curly hair', and another morpheme meaning 'more than one'. However, the form of this plural morpheme is physically neither visible nor audible, i.e. it is not marked overtly. Forms that are not marked overtly are often called **zero forms** or **zero morphs**.

In this section, we have seen that we can split up words into meaningful units called morphemes. Morphemes usually have a certain form and a certain meaning. However, sometimes the identification of form and/or meaning is problematic, and needs a more careful investigation. In the next section we will see how we can classify morphemes in terms of their properties.

3.3 Types of morphemes

Until now we have treated morphemes as a group of homogeneous units. However, morphemes may differ from each other in a number of characteristics, as we

will see in this section. To capture these differences, morphologists group morphemes together into certain types.

The first type can be identified if you consider the behaviour of the morphemes *mother* and *-ment* in the sentences below. Try to capture the difference between the morphemes *mother* and *-ment*. Awkward sentences are marked by a question mark.

(8) a. **Mothers** usually take too much care of their children.
b. It is difficult to combine a career with **motherhood.**
c. Sandra is a **mother** of three young children.

(9) a. This **settlement** consists of just ten houses.
b. **Management** of an electronics firm is not an easy task.
c. ?I saw a **ment** yesterday.

Both *mother* and *-ment* can appear in combination with other morphemes: *mother* can combine with the plural morpheme *-s*, or with the morpheme *-hood* meaning 'state of being X'. Similarly, *-ment* can also combine with other morphemes, such as *settle* and *manage*. However, the morpheme *mother* differs from *-ment* in that it can also stand alone, without any other morpheme attached to it, as in (8c), whereas the morpheme *-ment* cannot, as becomes evident in (9c). Consequently, the difference between the two morphemes lies in their ability or inability to stand alone. Morphemes such as *mother*, which can occur on their own, without any other morphemes attached to them, are called **free morphemes**. Morphemes that appear only in combination with other, usually free, morphemes are called **bound**. For instance, in the example *motherhood* above, the bound morpheme *-hood* appears attached to the morpheme *mother*. Similarly, in the word *management* the morpheme *-ment*, which is bound, appears attached to the morpheme *manage*, which is free. Parts of words such as *mother* in *motherhood* and *manage* in *management* which serve as the basis for attaching other morphemes are called **bases**. There is also another term, **stem**, which is used to denote bases to which bound morphemes carrying grammatical meaning, such as 'plural', attach. However, since the use of the terms 'base' and 'stem' is not always consistent in the morphological literature, we will not employ the term 'stem' here to avoid confusion.

So far we have clarified that in the word *motherhood*, *mother* is the base and *-hood* is a bound morpheme. But you might wonder whether there is any special term for the word *motherhood* itself, i.e. the word derived from the base. This term is **derivative**. Let us now take a closer look at bases. For this purpose, try to figure out the differences between the words in (10a–c):

(10)	a. agree	b. disagree	c. disagreement
	construct	construction	constructional
	cheer	cheerful	cheerfulness
	combine	recombine	recombination
	nature	natural	supernatural

As you may have noticed, (10a) gives the bases for the derivatives in (10b), which in turn contains the bases for the derivatives in (10c). The examples in (10b) show derivatives that have bases that are morphologically simplex. (10c) can be further analysed into constituent morphemes. For instance, the base of the derivative *disagreement*, i.e. *disagree*, can be analysed as having two constituent morphemes: *dis-* and *agree*. Such bases are therefore complex words. Bases wich are simplex are called **roots**. For example, the root in *disagreement* is *agree*. Roots are the core elements of words, and normally a word cannot exist without a root. We conclude that bases can be simplex or complex. Roots, by contrast, are always simplex.

Now let us deal in greater detail with bound morphemes. We will use some of the examples mentioned in (8) and (9) and add some new data. What is the difference between the bound morphemes in (11a) and those in (11b)?

(11)	a. unhappy	b. management
	dislike	motherhood
	mispronounce	settlement
	malnutrition	cupful

Generally, bound morphemes, such as *un-* and *-ment*, which appear only attached to bases, are termed **affixes**. The difference between the two groups of affixes in (11) is that those in (11a) are attached before the base, whereas those in (11b) appear after the base. They are called **prefixes** and **suffixes**, respectively. We can therefore conclude that affixes can differ in their position with respect to their bases.

Prefixes and suffixes are the two most common types of affixes. There are, however, other types. Consider the following data taken from Tagalog, the official language of the Philippines (data from McCarthy and Prince 1993: 101–105), and try to figure out how they differ from the affixes in (11) above:

(12)	**base and its meaning**	**affix**		**derivative and its meaning**
	a. gradwet	-um-	→	gr-um-adwet
	‘graduate’			‘one who graduated’
	b. sulat	-um-	→	s-um-ulat
	‘write’			‘one who wrote’

In the examples in (12) the affix is not attached before or after the base, as was the case with the examples above, but inserted into the base. Affixes of this type are called **infixes**. English does not have infixes of a type similar to Tagalog. What we do find in English is a kind of infixation where whole words can be inserted into a base to indicate a negative attitude which a speaker holds towards something, as in *abso-bloody-lutely*, *kanga-bloody-roo*, *Kalama-goddam-zoo* (the last two examples cited from Katamba and Stonham 2006: 45).

To summarise, we have seen that there is a variety of morpheme types. The knowledge of these types allows us to do an accurate morphological analysis of every complex word in a language. In the next section, we will take a more detailed look at how such an analysis works.

3.4 Morphological analysis of words

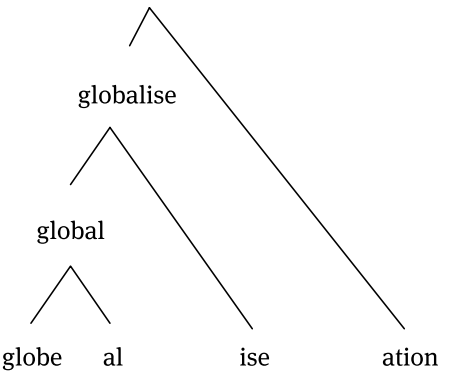
To understand how morphological analysis of words works, we should deal with the question: What aspects are worthwhile mentioning in order to describe the morphological structure of a word? Let us consider the complex word *blender*. What can we say about its morphology? One aspect we can mention is that it consists of two morphemes, *blend* and *-er*. Besides, we can say that *blend* is the root, since it is not further analysable, and at the same time the base to which the suffix *-er* is attached. To conclude, if we carry out morphological analysis, we usually show what morphemes a word consists of and describe these morphemes in terms of their type. We can also present the structure of this word by way of a tree diagram, as in (13):

(13) blender

Let us now turn to a more sophisticated case, such as *globalisation*. We can say rather straightforwardly that it contains the root *globe* and three suffixes: *-al*, *-ise* and *-ation*. But what bases can be identified in this word, and which suffix is attached to which base? Since the suffixes in *globalisation* appear in sequential order, we can assume that each suffix has been attached successively to that part of the word after which it appears. For instance, *-al* appears after *globe*, therefore *globe*, in addition to being the root, also serves as the base for the suffix *-al*. The suffix *-ise* appears after *global*, and therefore *global* is the base for this suffix, and so on. We can nicely illustrate this analysis graphically by drawing a tree diagram

of this word as in (14). Note that spelling changes may occur if affixes are attached to a base.

(14) globalisation



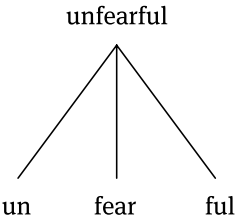
We can now summarise our analysis of the word *globalisation* in the following way:

(15) *globe* is the root and the base for the suffix *-al*
global is the base for the suffix *-ise*
globalise is the base for the suffix *-ation*
globalisation is the resulting derivative

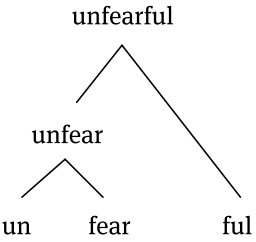
In general, we can conclude that in a morphological analysis, we need to identify not only the morphemes and their types, but also the order in which the morphemes are combined with each other.

So far we have examined words that contained only suffixes. You might now be tempted to ask how words containing both suffixes and prefixes can be analysed. Consider, for instance, the words *unfearful*, *recombinable*, or *unreadable*. At first sight, the morphological analysis of these words seems to present no difficulty. We can say that all the three words consist of three morphemes: one prefix, one root and one suffix. However, if we start to identify the bases for each affix, which is a crucial part of morphological analysis, the whole matter is no longer clear. Is, for instance, *fear* the base for the prefix *un-* in *unfearful*, or the base for the suffix *-ful*, or for both simultaneously? In other words, in which order are the morphemes in these words attached to each other? We will take a closer look at the word *unfearful*. As it may have become clear from the discussion above, we can think of three potential analyses of this word:

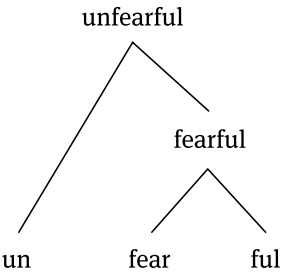
(16) a.



b.



c.



The diagram in (16a) suggests that the two affixes are added simultaneously to the base *fear*. According to the diagram in (16b), first the prefix *un-* is attached to the base *fear*, and then the suffix *-ful* is attached to the base *unfear*. Finally, the analysis in (16c) shows yet another variant: First the suffix *-ful* is attached to the base *fear*, and then the prefix *un-* is attached to the base *fearful*. But which of the three variants is the most appropriate one?

One way of answering this question is to examine the meaning of the word *unfearful* in order to find out which of the three potential constellations of morphemes given in (16) yields this meaning. The meaning of the word *unfearful* can be paraphrased as 'not fearful' or 'not full of fear'. This meaning suggests two steps in the formation of the word *unfearful*. First, the meaning 'full of fear' is created by means of attaching the suffix *-ful* to the base *fear* and then this meaning is negated by means of attaching the prefix *un-* to the base *fearful*. Given this overall meaning, we might suggest that possibly the variants in (16a) and (16b) should be abandoned. The analysis in (16a) seems to be incorrect since it presupposes that both affixes are attached simultaneously to the base *fear*, and this is improbable

since, as suggested above, the meaning of the noun *unfearful* is created in steps. Similarly, the analysis in (16b) is problematic since it forces us to say that the prefix *un-* in *unfearful* first forms the noun *unfear*, which then must mean something like 'not fear' and adding the suffix *-ful* then renders the meaning 'full of not fear', which is not the meaning of *unfearful*. Besides, in this case it is also unclear what meaning the noun *unfear* might have in English. In contrast, the analysis in (16c) yields exactly the meaning 'not fearful'.

Another argument in favour of the analysis in (16c) comes from the formal behaviour of affixes. Usually, affixes attach to bases of special word-classes, i.e. nouns, verbs, adjectives, etc. Consequently, the question we should pursue now is to which bases the affixes *un-* and *-ful* attach. For this purpose, we could make a list of other words containing the same affixes and note the word-class of the base. This is done in (17) where A stands for 'adjective' and N for 'noun':

(17)

base	***un*-derivative**	**base**	***-ful*-derivative**
usual (A)	unusual	respect (N)	respectful
pleasant (A)	unpleasant	regret (N)	regretful
clear (A)	unclear	pity (N)	pitiful
happy (A)	unhappy	tact (N)	tactful

The conclusion that can be drawn on the basis of (17) is that the prefix *un-* attaches primarily to adjectives. Cases in which it is attached to nouns are rare, and in fact the word *unfear* is unattested in English. This again strongly suggests that the analysis in (16b) is problematic since it presupposes the creation of the noun *unfear*, which is not readily possible according to the formal properties of the prefix *un-*. The suffix *-ful*, by contrast, does attach readily to nouns, which supports the idea of the suffix *-ful* being first attached to the noun *fear*. The formal analysis also speaks against the variant in (16a): The tree diagram in (16a) suggests that both *un-* and *-ful* are simultaneously attached to the noun *fear*, which is improbable, since we now know that *un-* does not normally attach to nouns. We can therefore assume on the basis of this formal evidence, that first, the suffix *-ful* is attached to the noun *fear*, and then the prefix *un-* is attached to the adjective *fearful*.

We can conclude so far that both the formal analysis and the analysis based on meaning yield the same result. In the case of the complex word *unfearful*, the suffix *-ful* is attached to the noun *fear* first, and then the prefix *-un* is attached to the adjective *fearful*. In general, we can say that both semantic (i.e. meaning-related) and formal arguments are useful in defining the structure of complex words. Another important generalisation that emerges from the analysis above is that when a word contains several affixes, they are not attached to the root or a base all at once, but in a certain order. Having learned a number of crucial

properties of morphemes, we will deal with different ways of realising the same morpheme in the next section.

3.5 Realisations of morphemes: allomorphs

We have defined morphemes as units that usually have a certain meaning and a certain form. For most of the examples we have regarded so far we postulated one meaning and one phonetic form. This might be true for some morphemes, such as the morpheme *dream*, which we discussed in section 3.2. However, with most morphemes there is no one-to-one relation between form and meaning. Instead, it is often the case that one and the same meaning is expressed by more than one form.

Consider, for instance, the articles set in bold in the data in (18). Note that there is one more article in (18c), *the*, which we will ignore in our discussion. In the phonetic transcription, the symbol 'ˈ' indicates that the following syllable is stressed.

(18) a. There is **a** dog over there.
[əˈdɒg]
b. He is recovering from **an** illness.
[ənˈɪlnəs]
c. I said '**a**' dog, not 'the' dog.
[ˈeɪdɒg]

We can identify three different phonetic forms of the articles in (18): [ə], [ən] and [eɪ]. The question that arises now is: Do these forms represent three different morphemes, or one and the same? Since the meaning of these forms is the same, we can suggest that all three forms should be regarded as instances of the same morpheme. And this morpheme is known as the indefinite article. Following established conventions, we will present this morpheme by putting it in braces: {INDEFINITE ARTICLE}.

We are presented with the rather amazing fact that one and the same morpheme may have different physical realisations. To make sure that we are not dealing with random exceptions, let us collect some more data with the same morpheme. They are given in (19):

(19)

a cup	[əˈkʌp]	an arm	[ənˈɑːm]	'**a**' cup, not 'the' cup	[ˈeɪkʌp]
a lake	[əˈleɪk]	an egg	[ənˈeg]	'**a**' lake, not 'the' lake	[ˈeɪleɪk]
a face	[əˈfeɪs]	an apple	[ənˈæpl̩]	'**a**' book, not 'the' book	[ˈeɪbʊk]

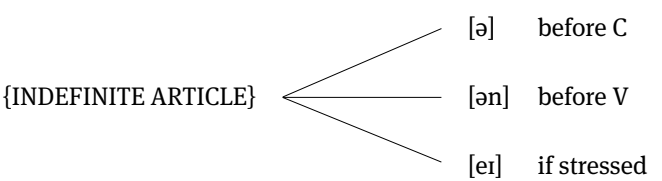
The data in (19) confirm our preliminary conclusion that the indefinite article has three different physical forms in English, [ə], [ən] and [eɪ]. As we have already seen above, the term used in morphology to refer in general to the form of any morpheme is 'morph'. However, when the same morpheme is realised through different morphs, we speak of **allomorphs**. Allomorphs are different morphs representing the same morpheme. The parts of the term 'allomorph', *allo* and *morph*, come from Greek and mean 'different' and 'form', respectively. In the case of the indefinite article above, we can say that [ə], [ən] and [eɪ] are allomorphs of the morpheme {INDEFINITE ARTICLE}.

But how come that we understand the meaning of this morpheme despite its different physical shapes? Obviously, we classify what we hear into abstract categories. The morpheme is such an abstract category that exists in our minds. This abstract mental category is realised physically, i.e. concretely, in a certain way or a number of ways. For instance, in the case of the indefinite article, the different allomorphs that we hear represent one abstract category, the morpheme {INDEFINITE ARTICLE}. The relation morpheme-allomorph is similar to the relation phoneme-allophone we learned about in the previous chapter. Both allophones and allomorphs are concrete physical realisations of some abstract categories. However, whereas allophones are realisations of an abstract phonological category, i.e. the phoneme, allomorphs are realisations of an abstract morphological category, i.e. the morpheme.

Let us now take a closer look at the distribution of the allomorphs in (19). Is it totally random or governed by some rule? Concentrating on the sounds following the indefinite article in the examples in (19) we can make an interesting observation. The allomorph [ə] appears only if the following word begins with a consonant, as in [əˈdɒg]. The allomorph [ən] surfaces if the following word begins with a vowel, as in [ənˈeg]. Finally, when the article is stressed, the allomorph is [eɪ]. This type of conditioning, in which the distribution of allomorphs is governed by the sound structure, is called **phonological conditioning**.

We can conclude from our observations above that the distribution of the allomorphs of the indefinite article is by no means random. Quite on the contrary, it is totally predictable. We can predict, for instance, when the morpheme {INDEFINITE ARTICLE} will be realised as [ə], and when as [ən] or [eɪ]. And since the distribution is predictable, we can capture the distribution as in (20):

(20)



There are several other interesting cases of allomorphy in English. Consider, for instance, the different realisations of the English plural morpheme in (21):

(21) a.	lip	[lɪp]	lips	[lɪps]
	rib	[ɹɪb]	ribs	[ɹɪbz]
	case	[keɪs]	cases	[keɪsəz]
b.	tooth	[tuːθ]	teeth	[tiːθ]
	sheep	[ʃiːp]	sheep	[ʃiːp]
	ox	[ɒks]	oxen	[ɒksən]

The words in the rightmost column consist of two morphemes: the base and the morpheme {PLURAL}. As you might have noticed, the morpheme {PLURAL} is realised in a variety of ways in (21). For instance, in the examples in (21a) it is realised by adding a suffix that has three different phonetic forms: [s], [z] and [əz]. Since the majority of English nouns form their plural in this way, these realisations are called 'regular'. In the examples in (21b) the plural morpheme is realised differently. Since there is a rather small number of nouns that do not form the plural in the way shown in (21a), the realisations of the plural morpheme exemplified in (21b) are called 'irregular'. We will now take a closer look at regular and irregular realisations of the plural morpheme.

Let us first analyse the regular realisations. It has already been mentioned above that there are at least three different regular realisations of the plural morpheme: [s], [z] and [əz]. However, to substantiate this claim, we need more data. These are provided in (22). It would be useful for you to mark those parts in the words of the rightmost column which in your opinion express the plural.

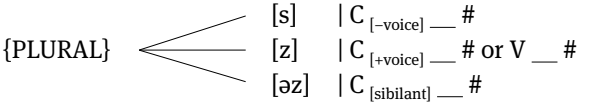
(22) a.	lip	[lɪp]	lips	[lɪps]
	rat	[ɹæt]	rats	[ɹæts]
	stick	[stɪk]	sticks	[stɪks]
	cliff	[klɪf]	cliffs	[klɪfs]
	path	[pɑːθ]	paths	[pɑːθs]
b.	rib	[ɹɪb]	ribs	[ɹɪbz]
	bed	[bed]	beds	[bedz]
	bug	[bʌg]	bugs	[bʌgz]
	claim	[kleɪm]	claims	[kleɪmz]
	star	[stɑː]	stars	[stɑːz]
c.	case	[keɪs]	cases	[keɪsəz]
	nose	[nəʊz]	noses	[nəʊzəz]
	lash	[læʃ]	lashes	[læʃəz]
	stitch	[stɪtʃ]	stitches	[stɪtʃəz]
	judge	[dʒʌdʒ]	judges	[dʒʌdʒəz]

The data in (22) confirm our observation that the plural morpheme has three different regular allomorphs: [s], [z] and [əz]. But what is their distribution, i.e. what causes the allomorphy? In the case of the indefinite article we examined the sounds that followed the different allomorphs. Since nothing follows the allomorphs of the plural morpheme in (22), we may try to concentrate on what sounds precede them. In this case, it would be useful to list all the different sounds after which each allomorph occurs in the data:

(23) [s] occurs after: [p], [t], [k], [f], [θ]
[z] occurs after: [b], [d], [g], [m], [ɑː]
[əz] occurs after: [s], [z], [ʃ], [tʃ], [dʒ]

The lists in (23) give us a good idea of the environments in which each of the allomorphs occurs. However, mere listing is not a very helpful procedure because lists lack the power of generalisation which is necessary for a systematic description of linguistic phenomena. Therefore, in a next step, our task is to find out whether the sounds listed for each allomorph have something in common. Their phonological features might be an obvious choice. And indeed, all sounds after which the allomorph [s] occurs have one feature in common, they are voiceless. In contrast, the voiced allomorph [z] occurs after voiced consonants (e.g. [b], [d], [g], [m]) and after vowels (e.g. [ɑː]). In other words, the voiced allomorph [z] occurs after voiced sounds. The sounds after which the allomorph [əz] occurs seem to have nothing in common at first sight. However, if we consider their articulatory features, we discover an interesting similarity between them. [s], [z], [ʃ], [tʃ], [dʒ] are alveolar (or palato-alveolar) fricatives or affricates that are characterised by a particular hissing noise. Phonologists have shown that these sounds behave similarly in many languages and have therefore assigned them to a class of their own, called **sibilants**. Hence, we can generalise that the allomorph [əz] occurs after sibilants. And we can draw the conclusion that, like the allomorphs of the indefinite article, the regular allomorphs of the English morpheme {PLURAL} are phonologically conditioned. Their distribution is again predictable and can be formalised as follows (the symbol '|' means 'in the following context:'):

(24)



The representation in (24) reads as follows: the morpheme {PLURAL} is realised as [s] after voiceless consonants, and as [z] after voiced consonants or after vowels, and as [əz] after sibilants.

Now let us turn to the irregular realisations of the plural morpheme. We will repeat the examples from (21b) and add more data.

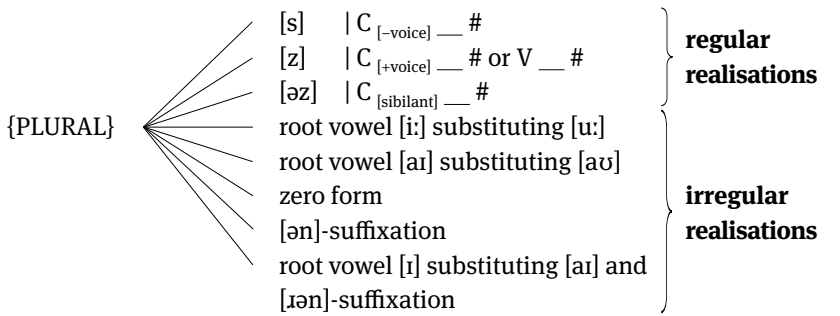
(25)	a.	tooth	[tuːθ]	teeth	[tiːθ]
		goose	[guːs]	geese	[giːs]
		mouse	[maʊs]	mice	[maɪs]
	b.	sheep	[ʃiːp]	sheep	[ʃiːp]
	c.	ox	[ɒks]	oxen	[ɒksən]
	d.	child	[tʃaɪld]	children	[tʃɪldɹən]

As can be inferred from (25), the morpheme {PLURAL} has a number of different irregular realisations. In (25a) it is realised by a vowel change. In *tooth – teeth* and *goose – geese* the base vowel changes from [uː] to [iː], in *mouse – mice* from [aʊ] to [aɪ]. Therefore, we can say that in the words in (25a), the allomorphs are the root vowels [iː] and [aɪ] that substitute the root vowels [uː] and [aʊ], respectively. In the case of the noun *sheep* the morpheme {PLURAL} is realised by no overt change in form, i.e. by a zero form. In *oxen* the plural is expressed by adding a suffix whose phonetic form is [ən]. Thus, the allomorph is [ən]. Finally, in *children*, the plural morpheme is expressed by combining a vowel change from [aɪ] in *child* to [ɪ] in *children* and the suffixation of [ɹən].

We can say therefore that there are different irregular realisations of the morpheme {PLURAL}. The root vowels [iː] and [aɪ] substituting the root vowels [uː] and [aʊ], a zero form, [ən], and a combination of the root vowel [ɪ] (which substitutes the root vowel [aɪ]) and [ɹən]-suffixation. The challenging question now is what triggers each allomorph. In the case of phonological conditioning it was the sound that follows or precedes a given morpheme, but in the case of the examples above the shape of the morpheme does not depend on the sound structure. In fact, it depends on the individual word of which the plural should be formed. The plural form of each of the words must therefore be learned separately as the plural of that particular word. So, if the word is *sheep*, we know that the allomorph is zero. If the word is *ox* then the allomorph is [ən], and so on. This type of conditioning is called **lexical conditioning**.

Now we can revise our schema of the allomorphy of the English morpheme {PLURAL} in (24) above by adding the irregular realisations to it:

(26)



Let us now deal with another interesting case of allomorphy. Consider the bases [kənˈkluːd], [kənˈkluːʒ] and [kənˈkluːs] in (27) and think whether they represent the same morpheme. The symbol 'ˈ' again indicates that the following syllable is stressed. For a better identification of the bases in the examples *conclusion* and *conclusive*, the suffixes in the phonetic transcriptions of the last two words are separated from the bases by a hyphen.

(27) conclude [kənˈkluːd]
conclusion [kənˈkluːʒ-ən]
conclusive [kənˈkluːs-ɪv]

To test whether they represent the same morpheme, we have to check whether all three bases have the same meaning. Their meaning is indeed the same: 'to infer that something is true on the basis of the facts at hand', and we can therefore regard the forms in (27) as allomorphs of the same morpheme: {CONCLUDE}. Obviously, the three allomorphs differ only in the realisation of the final consonant: [d] in *conclude*, [ʒ] in *conclusion* and [s] in *conclusive*. But what triggers the allomorphy in this case? Let us take a closer look at the morphological structure of the words in (27). *Conclude* is a simplex word, it consists of the base [kənˈkluːd] only. In contrast, *conclusion* and *conclusive* are complex words. They consist of the bases [kənˈkluːʒ] and [kənˈkluːs] and the suffixes [ən] and [ɪv]. We can observe so far that, if no suffix is added, the morpheme {CONCLUDE} has the form [kənˈkluːd], but when suffixes are added, this morpheme has different forms. When the suffix [ən] follows, it has the shape [kənˈkluːʒ] and when a different suffix, [ɪv], is attached, it has the shape [kənˈkluːs].

We can infer from the analysis above that the allomorphy of the morpheme {CONCLUDE} is determined by the affix that follows it. Since it is a morpheme, in particular a suffix, that is responsible for the alternation, this type of conditioning is called **morphological conditioning**. This type is rather common in English, and there are many bases that change their shapes when different affixes are at-

tached. These changes may not only affect individual sounds, but also the stress pattern. In (28) some more examples of morphologically conditioned allomorphy are provided, including stress marks:

(28) a. agile [ˈædʒaɪl]
agility [əˈdʒɪl-əti]
b. demon [ˈdiːmən]
demonic [dɪˈmɒn-ɪk]
c. exclaim [ɪksˈkleɪm]
exclamation [ˌekskləˈm-eɪʃən]
d. receive [ɪˈsiːv]
receptive [ɪˈsept-ɪv]

The English morpheme {AGILE} has the allomorphs [ˈædʒaɪl] (when no affix is attached) and [əˈdʒɪl] (when the suffix *-ity* is attached). They differ from each other both in the quality of the vowels and in their stress pattern. Thus, in *agility*, the vowel [æ] changes into [ə], and the diphthong [aɪ] changes into the monophthong [ɪ], and the stress shifts from the first to the second syllable. Similar analyses can be applied to the words in (28b–d).

In conclusion, we have seen that morphemes are abstract units that have different concrete realisations, allomorphs. The distribution of allomorphs is usually predictable and can be conditioned by a number of different factors: phonological, lexical and morphological.

3.6 Morphological processes: inflection and derivation

We have learned so far that morphemes are minimal building blocks of words. But what exactly is the purpose of combining morphemes into words? To deal with this question, consider the reasons for using the suffixes *-s*, *-ed* and *-er* in the words *bakes*, *baked* and *baker* below:

(29) a. She **bakes** sweet-scented cakes on Sundays.
b. She **baked** sweet-scented cakes last Sunday.
c. She knows a good **baker**.

In (29a), we attach the present tense suffix *-s* to the verb *bake* because we must use this tense form to indicate that something, in this case the baking, is happening regularly and at the present time. Furthermore, the subject of this

sentence is the third person pronoun *she*, which – in present tense sentences – requires the use of the suffix *-s* on the verb. So the reason for using the suffix *-s* in (29a) is grammatical in nature and is dictated by the grammatical rules of English. Similarly, in (29b) we have to use the suffix *-ed* on the verb *bake* if we want to say that the baking happened in the past. The suffix *-ed* is thus again determined by a grammatical rule of English and it expresses grammatical information, namely that the verb is in the past tense. In none of the two cases would we say that the meaning of the verb *bake* has changed, since in both cases it means something like 'cook in an oven'. The suffixes only specify the word grammatically. By contrast, the suffix *-er* in *baker* creates a completely new concept, i.e. 'person who bakes', and the occurrence of *-er* is not dictated by any grammatical rule of English. In fact, if you exchange the suffix *-er* for another suffix, e.g. *-ery*, you will do no damage to the grammar of this sentence. *She knows a good bakery* is as grammatically correct as *She knows a good baker*. What we change, however, is the meaning of this sentence, since the word *bakery* means something different from the word *baker*.

There is another important observation we can make on the basis of the data above. We have already observed that the words *bakes* and *baked* have the same meaning. The two words *bakes* and *baked* should therefore be regarded not as two different words, but as two different forms of a single word. At this point we need to be more careful about what we mean when we say 'word'. Obviously, we have been using the term for two entirely different things. On the one hand we have used it to refer to grammatically fully specified forms, such as *bakes* and *baked*. On the other hand, we have used the notion of 'word' to refer to an abstract unit, the verb *bake*, which manifests itself in different forms, such as *bake*, *baking*, *baked*, *bakes*. To properly differentiate between these two uses of the notion of 'word', we need more terminology. For the notion of 'word as an abstract unit in the vocabulary of a language' we will use the term **lexeme**. Notationally, lexemes are indicated by means of small capitals, e.g. BAKE. The different grammatically specified forms of a given lexeme are called **word-forms** or **grammatical words**. Returning to our example *baker* vs. *bakes/baked*, we would not think of *baker* as a word-form of the lexeme BAKE, but regard it as a different lexeme, i.e. BAKER. This lexeme BAKER manifests itself again in different word-forms, such as the singular form *baker*, the plural form *bakers* and the possessive form *baker's*.

Based on our discussion, we can now draw the following conclusion concerning the purpose of the suffixes *-s*, *-ed* and *-er*. The suffixes *-s* and *-ed* in *bakes* and *baked* are used to encode grammatical information and thus to create different word-forms of the same lexeme. Such affixes are called **inflectional**, and the morphological expression of grammatical information and categories is termed **inflection**. By contrast, *-er* is used for a different purpose, namely to create a new

lexeme. Affixes that serve to create new lexemes are called **derivational**, and the creation of new lexemes by affixation is called **derivation**. Note that in this context 'new' does not mean 'never seen before in the language', but rather 'different in meaning from the base'.

Given the distinction between inflectional and derivational morphemes, two questions arise. First, you might be tempted to ask what other grammatical words, besides the past tense or third-person-singular forms, can be created by inflectional affixes. The inventory of regular English inflectional morphemes is provided in (30):

(30)

affix	**function**	**examples**
-s	creates the plural form of nouns	*cats, days*
's	creates the possessive form of nouns	*Peter's, John's*
-ed	creates the past tense and past participle forms of verbs	*played, stopped, cared*
-s	creates the third person singular present tense form of verbs	*(he/she/it) plays, stops, cares*
-ing	creates the progressive form of verbs	*(is/are) playing, going, writing*
-er	creates the comparative form of adjectives	*warmer, colder*
-est	creates the superlative form of adjectives	*warmest, coldest*

Evidently, besides the plural form of nouns or the past tense form of verbs, inflectional suffixes can also create other grammatical forms. For instance, in *Claire's passion* the suffix *'s* creates the possessive form of the noun *Claire*. In *He is cooking supper* the suffix *-ing* is used to create the progressive form of the verb *cook*. In general, however, we can say that the inventory of English inflectional morphemes is quite small.

Another question that arises is whether the difference in function is the only feature by which inflectional and derivational affixes can be distinguished. In fact, the two types of affixes also differ in a number of other features. The first difference can be established if we compare the position of the inflectional affixes listed in (30) above with respect to their bases with the position derivational affixes can occupy in English lexemes. All inflectional affixes in (30) are evidently suffixes. With derivational affixes, the situation is different. In addition to derivational suffixes, such as *-age* in *spillage*, or *-ish* in *reddish*, there are many derivational morphemes that are prefixes, such as *dis-* in *disorganisation*, *re-* in *retry*, or *anti-* in *antifreeze*. We can therefore conclude that in English, inflectional morphemes are only suffixes, whereas derivational morphemes can be both suffixes and prefixes.

Another interesting difference between the two types of affixes lies in the consistency of their meaning or function. Consider, for example, the meanings of the derivatives with the suffix *-ise* in (31a) and compare this state of affairs to that of the inflected words in (31b).

(31)	**example**	**word meaning**	**affix meaning/function**
a.	computerise	'put into a computer'	'put into X'
	hospitalise	'put into a hospital'	'put into X'
	modernise	'make (more) modern'	'make (more) X'
	regularise	'make (more) regular'	'make (more) X'
	brotherise	'provide with a brother'	'provide with X'
	gutterise	'provide with a gutter'	'provide with X'
b.	cars	'more than one car'	'more than one'
	tables	'more than one table'	'more than one'
	shoes	'more than one shoe'	'more than one'
	cottages	'more than one cottage'	'more than one'

Obviously, the function of the inflectional suffix *-s* is consistently the same in every word to which it is attached: It signals the plural. By contrast, *-ise* seems to have a number of different (though probably related) meanings. We can therefore conclude that inflectional affixes have consistently exactly the same meaning in all words they are attached to, whereas derivational affixes do not always exhibit this consistency. A given derivational affix may have different meanings. Note, however, that this raises the question whether the data in (31a) might show that we are actually dealing with three different *-ise* suffixes, instead of only one, with each of them having its own distinct meaning. This question leads us to the more general theoretical problem of how one should analyse words and morphemes that have more than one meaning. For example, should we assume the existence of two lexemes TREE$_1$ and TREE$_2$, one meaning the plant, the other meaning an abstract structural representation as the one in (14)? Or should we assume the existence of only one lexeme TREE that happens to have two closely related meanings? This problem will be discussed in detail in our chapter on meaning, in section 5.4.2. We have assumed here that we are indeed dealing with only one suffix *-ise*, which can have different, related meanings.

Inflectional and derivational affixes differ in yet another property. Let us consider whether the English past tense suffix *-ed* can be attached to every verb in English. In fact, it can be attached to every regular verb. Or take the third person singular suffix *-s*, as in *(he) writes* or *(he) carries*. There is no English verb (with the exception of BE) to which this suffix cannot be attached. We can thus say that inflectional affixes seem to be able to occur on most words of a given class. But

how do derivational affixes behave in this respect? Let us examine the English derivational suffix *-ity*, which attaches to adjectives to create nouns. There are many adjectives on which it can occur, as in *sanity*, *clarity*, *stability*, *creativity*, *polarity*, etc. However, there are also many adjectives to which it cannot be attached. For instance, the derivatives **longity*, **joyfulity*, **freeity* are unattested in English. We can thus establish yet another important difference between inflectional and derivational morphemes, namely that inflectional morphemes can be attached to most or all words of a given class, whereas derivational morphemes have a more restricted usage.

Another difference between the two types of affixes concerns word-class. Consider what happens to the word-class of the base words in (32) below when the inflectional third person singular present tense suffix *-s* and the derivational prefix *-er* are attached.

(32)

	base	**word-class of the base**	**suffixed form**	**word-class of the suffixed form**
a.	walk	V	walks	V
	write	V	writes	V
	bake	V	bakes	V
b.	walk	V	walker	N
	write	V	writer	N
	bake	V	baker	N

Obviously, whenever we attach the third person singular present tense suffix *-s* to a verb, it remains a verb, as the examples in (32a) show. The same observation can be made for any of the inflectional suffixes listed in (30) above. The derivational suffix *-er*, however, behaves in a different way in this respect. It changes the word-class of its bases from verb to noun. This is also the case with many other derivational affixes, as, for instance, with the derivational suffix *-less*, which changes nouns into adjectives, as in *joy* (N) – *joyless* (A), or the derivational suffix *-en* which changes adjectives into verbs, as in *black* (A) – *blacken* (V), etc. Note, however, that very few English prefixes change the word-class of the base. They are nevertheless considered derivational because they create new lexemes, and not word-forms of the same lexeme, as, for instance, *semi-transparent*, *impossible*, *replay*. We can conclude that whenever an affix changes the word-class of the base, it is a derivational affix.

To summarise, we have seen in this section that affixes can be grouped into two different types according to their function: derivational affixes, which are used to create new lexemes, and inflectional affixes, which are used to express different word-forms of the same lexeme. The two types of affixes differ

in a number of properties. We will summarise these properties in the following table:

(33)

inflectional affixes	**derivational affixes**
– are always suffixes in English	– can be suffixes and prefixes
– have consistently the same grammatical function in every word they attach to	– can have different meanings in different words
– attach to every word of a given class	– attach to certain words of a given class
– never change the word-class of the base	– can change the word-class of the base

Using derivational affixes is only one of many possible ways of creating new lexemes. In the next section we will take a closer look at different processes by which new lexemes can be created.

3.7 Word-formation

3.7.1 What is word-formation?

It has already been mentioned above that, among other things, morphology deals with the ways of creating new lexemes. We have also seen in the previous section that one such way is adding derivational affixes to existing bases. However, there are many other ways by which speakers can create new lexemes and thus give names to new things, abstract notions, etc.

If, for example, a five-year-old child whose native language is English wants to invent a name for a flag decorated with moons, he or she might naturally call this type of flag a *moon-flag* because as a speaker of English the child knows that new concepts can be denoted just by putting several words together into one (example from Clark 1993: 148). Or imagine a situation in which a speaker is faced with the necessity to tell her interlocutor that she searched the internet auction *ebay* the day before. The strategy this speaker would possibly resort to is just using the name *ebay* to denote the process associated with this name: *Yesterday, I ebayed till late in the evening*. The speaker would do so probably because she is aware of the fact that one and the same form can be used to denote both objects and processes connected with these objects. Yet another situation would trigger the use of a different strategy. For instance, if the speaker is an experienced university student who has attended many lectures, she might refer to a lecture as *a*

lec in a conversation with her fellow-students one day. She will be able to do so because she has many words of the same type in her mind, such as *exam*, *lab* and *prof*, and knows that such shortened words can be used to express familiarity with the concept they denote.

These and some other strategies of creating new lexemes are studied within a special area of morphology called **word-formation**. In the sections to follow we will take a closer look at different word-formation processes.

3.7.2 Affixation

We have already dealt with one common strategy of creating new words, namely adding affixes to existing bases. This is called 'affixation'. In English, we differentiate between **prefixation** and **suffixation**. The two strategies are illustrated in (34):

(34) a. disconnect
malfunction
unstable
pre-film

b. idolise
balloonist
extremity
nursery

Both prefixes and suffixes exhibit a number of interesting properties, and we will take a look at some of them, starting with suffixes.

As we have seen earlier in this chapter, suffixes often cause a number of phonological changes. Besides, suffixes often trigger another kind of change just discussed, that of changing the word-class. (35a) provides more examples of this kind:

(35) a.	forget	V	→	forgetful	A
	fiction	N	→	fictional	A
	elect	V	→	election	N
	solid	A	→	solidity	N
	speech	N	→	speechify	V
	black	A	→	blacken	V
b.	green	A	→	greenish	A
	devil	N	→	devilry	N
	professor	N	→	professorship	N

As becomes obvious in (35b), however, some suffixes do not change the word-class of their bases.

The data in (36) illustrate another pervasive fact about suffixes. Try to make observations on the differences between the affixes in (36) in terms of the word-class of their derivatives:

(36)	**suffix**	**base**	**derivative**
a.	-ee	employ, divorce, refuge	employee, divorcee, refugee
b.	-al	fiction, tradition, culture	fictional, traditional, cultural
c.	-en	black, broad, strength	blacken, broaden, strengthen
d.	-wise	length, clock, street	lengthwise, clockwise, streetwise

Obviously, each of the suffixes in (36) creates derivatives of a certain word-class. For instance, the suffix *-ee* creates nouns, the suffix *-al* creates adjectives, the suffix *-en* creates verbs, and *-wise* creates adverbs. Therefore, depending on the word-class of the derivative they create, suffixes can be subdivided into nominal, verbal, adjectival, and adverbial suffixes. For instance, the suffix *-al* is regarded as an adjectival suffix, since it creates adjectives.

Another interesting generalisation can be made if we consider the bases to which the suffixes in (36) are attached. For instance, all bases to which the suffix *-al* is attached are nouns: *fiction*, *tradition*, *culture*. We can say that the suffix *-al* attaches primarily to bases of a particular word-class, such as nouns. In contrast, the suffix *-en* in (36c) can attach to adjectives, e.g. *black* and *broad*, but also to nouns, e.g. *strength*. We can conclude that some suffixes attach primarily to bases of a certain word-class, whereas other suffixes can attach to bases of different word-classes.

Suffixes can render a whole range of different meanings, and some of these meanings are illustrated below. Try to figure out the meaning of the suffixes in (37) on the basis of these data:

(37)	**suffix**	**derivative**
a.	-er	commander, preacher, wanderer
b.	-er	mixer, cutter, toaster, slicer
c.	-ette	kitchenette, towelette, theatrette
d.	-ess	millionairess, waitress, tigress, hostess
e.	-able	movable, changeable, navigable, readable
f.	-ly	fatherly, womanly
g.	-en	blacken, broaden, quicken, lengthen

The words with the suffix *-er* in (37a) can be paraphrased as 'person who Xes'. A *commander* is a person who commands, a *preacher* is a person who preaches, and so on. Therefore, the suffix *-er* is often called an **agentive suffix**. The same suffix

can also be used to create words that denote instruments, as in *mixer*, *cutter*, etc. and is therefore regarded as an **instrumental suffix**. Derivatives with the suffix *-ette* have the meaning 'small X', therefore the suffix is called a **diminutive suffix**. The suffix *-ess* forms lexemes denoting female beings. A *tigress* is a 'female tiger', *-ess* is thus called a **gender-marking suffix**. The suffix *-able* often renders the meaning 'capable of being Xed', with *movable* meaning 'capable of being moved'. The derivatives containing the verbal suffix *-en* mean 'make (more) X'. These are just a few examples from a wide range of meanings that can be expressed by suffixes.

Let us now turn to prefixes. Consider the data below and try to establish the difference between the prefixes in (38a) and (38b):

(38)	a.	obey	V	→	disobey	V
		manage	V	→	mismanage	V
		try	V	→	retry	V
		rational	A	→	non-rational	A
		medical	A	→	premedical	A
		legal	A	→	illegal	A
		function	N	→	malfunction	N
		member	N	→	non-member	N
	b.	witch	N	→	bewitch	V
		large	A	→	enlarge	V
		forest	N	→	deforest	V
		courage	N	→	discourage	V

Obviously, in contrast to suffixes, many English prefixes do not change the word-class of the base. The data in (38b) show, however, that there are a few prefixes that can do so.

Prefixes can also render a variety of meanings. The following list provides some examples:

(39)	**prefix**	**example**
	non-	non-scientific, non-American, non-stop
	semi-	semi-desert, semi-conscious, semi-transparent
	mal-	malformation, malnutrition, maladministration
	pre-	pre-war, pre-historic, pre-arranged
	ultra-	ultra-light, ultra-conservative, ultra-thin

Evidently, the meaning of the prefix *non-* in *non-scientific* is 'not X'. Prefixes with such a meaning are called **negative prefixes**. The prefix *semi-* means 'half X',

and *semi-conscious* can be paraphrased as 'half conscious'. *Malformation* means 'wrong formation', therefore the meaning of the prefix *mal-* is 'wrong'. The prefix *pre-* has the meaning 'before X', as in *pre-war* 'before war'. *Ultra-* is called an **augmentative prefix** because it creates words with the meaning 'very, extremely X' (*ultra-conservative* is 'very/extremely conservative').

Interestingly, some affixes are often used to create new lexemes, whereas others are not. The English agentive suffix *-er*, for instance, is used very frequently and gave rise to many new words in the 20th century, such as *fictioner, jazzer, kinker, legger, litterer, packager, pager, socialiser*. In contrast, the suffix *-th*, as in *length*, *strength*, *width*, is attached to a very limited number of words, and is hardly ever used to create new words. These examples show that affixes may differ considerably in their ability to coin new words. This ability of affixes to create new words is called **productivity**. Productivity is a relative notion, i.e. some affixes are more productive than others. For instance, the agentive suffix *-er* is more productive than the nominal suffix *-th*, since it is used more often to create new words.

The productivity of a given affix is determined by a number of factors. Of course, new words are only created when there is a need for them, e.g. when a new concept, object, or property must be named. Consider how the authors of the following sentences use the suffix *-ness* to give names to a number of new concepts (examples taken from the *Oxford English Dictionary*):

(40) An irreproachable state of clean-shirtedness, navy blue-broadclothedness and chimney pot-hattedness.
Dislike-to-getting-up-in-the-morningness.

However, not every 'useful' or potentially possible word is indeed created. Quite often, the formation of a new word with a given affix simply does not happen, as the following data show. Impossible words are marked by an asterisk.

(41)

booking office	*ticketery
thief	*stealer
chairwoman	*chairess
friendship	*friendhood

The data in (41) suggest that the formation of a new word with a given affix is apparently impossible if there is already a word that denotes the same concept. Thus, we do not use the place-forming suffix *-ery* to name a place where tickets are sold because there is already the word *booking office* that denotes this concept. This phenomenon is called 'blocking'.

Besides blocking, there are a number of structural restrictions on the productivity of a given affix. Try to figure out what restriction operates on the bases to which the person-forming suffix *-eer* is attached. Pay particular attention to the stress pattern of the base words.

(42)	a.	auction	auctioneer	b. stock	*stockeer
		pamphlet	pamphleteer	book	*bookeer
		mountain	mountaineer	instrument	*instrumenteer
		basket	basketeer	police	*policeer

The examples in (42) illustrate a rather complex phonological restriction: The agentive suffix *-eer* attaches primarily to disyllabic bases that are stressed on the second-but-last syllable.

A restriction of a different type can be stated on the basis of the data in (43):

(43)	a.	adjectivise	adjectivisation	*adjectivisement
		hospitalise	hospitalisation	*hospitalisement
		institutionalise	institutionalisation	*institutionalisement
	b.	treat	treatment	*treatation
		adjust	adjustment	*adjustation
		accomplish	accomplishment	*accomplishation

The English nominal suffixes *-ation* and *-ment* are synonymous since both create nouns with the meaning 'process of Xing' or 'result of Xing' from verbs. However, only the suffix *-ation*, and not *-ment*, can be used to create nouns from the verbs listed in the first column of (43a). On the other hand, only the suffix *-ment*, and not the suffix *-ation*, can be attached to the bases in (43a). This means that there must be some difference between the bases in (43a) and (43b) that triggers the difference in the choice of the nominalising suffix. You might have noticed already that all bases in (43a) end in the suffix *-ise*. By contrast, the bases in (43b) do not end in *-ise*. Consequently, we can make the generalisation that the suffix *-ation* is attached only to those bases that end in the suffix *-ise*, whereas the suffix *-ment* attaches only to bases that do not contain the suffix *-ise*. We can therefore conclude that in the case of the suffixes *-ation* and *-ment* there is a morphological restriction at work, in that these suffixes are sensitive to the morphological structure of the bases to which they attach.

Yet another type of restriction is illustrated in (44). You may easily find out why the words in the third column are unattested in English.

(44)

actor	actress	*bookess
waiter	waitress	*airplaness
heir	heiress	*theatress
count	countess	*policess
lion	lioness	*milkess

The English suffix *-ess* attaches primarily to bases that denote human beings or higher animals. Therefore, formations with nouns denoting things, such as *theatress*, are impossible. This kind of restriction is semantic in nature.

To summarise, in this section we have discussed derivational affixation, one of the common processes of creating new words in English. We have seen that suffixes and prefixes have a number of different properties. Suffixes often change the word-class of the bases to which they attach, whereas prefixes do so in few cases only. Besides, affixes can be used to create a wide range of different meanings, such as agentive, instrumental, diminutive, augmentative, etc. Finally, we have seen that affixes can differ in their productivity, i.e. the extent to which they can be used to create new words, and that the productivity of a given affix can be restricted by phonological, morphological, and semantic factors.

3.7.3 Compounding

Another way of creating new words, extremely productive in English, is illustrated in (45).

(45)

moonlight	high-speed	overcoat
wildlife sanctuary	high-level	expert group

As you may have guessed, all words in (45) are formed by combining two or more words to form a new word. This process is called **compounding**. Like affixed words, English compounds have a number of interesting properties, some of which we will investigate below.

One of the interesting features of English compounds is their variable orthography. Consider the following data:

(46) a. ashtray, windmill, hotline
b. income tax increase, education minister
c. fast-food, icy-cold, call-girl

Obviously, there are three ways of spelling English compounds. Some compounds are spelled as one word, as in (46a). Others, such as those in (46b), are spelled

separately, and one group of compounds are written with a hyphen, as in (46c). Note that for some compounds, all three orthographic variants are attested (for instance, *breadbin*, *bread bin* and *bread-bin*). There are no hard and fast rules for compound orthography in English, but one important determinant of the spelling is frequency of occurrence. Compounds that are infrequent are unlikely to be spelled as one word or to be hyphenated.

Another interesting feature of English compounds is their stress pattern. Consider the difference in the stress pattern between the words in (47a) and in (47b). The stressed vowel is indicated by an accent.

(47) a. *a blácкboard*
'a board for writing on with chalk'
a blúebell
'a plant which has blue flowers in the shape of a bell'
a rédcoat
'a British soldier in the 18th and 19th centuries'

b. *a black bóard*
'a board which is black in colour'
a blue béll
'a bell which is blue in colour'

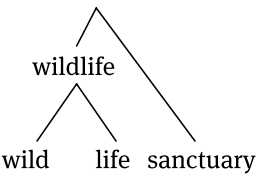
a red cóat
'a coat which is red in colour'

The constructs in (47a) are nominal compounds, i.e. nouns, and they are stressed on the left-hand member. In contrast, the constructs in (47b) appear to be syntactic constructs, not words, and they are stressed on the right-hand element. One can generalise therefore that compounds are regularly stressed on the left-hand element. However, one has to be careful since there are also sets of compounds that are stressed on the right-hand element. For example, compounds whose first element indicates a location or a material (as in *Boston hárbour, silk shírt*) are often stressed on the right-hand element.

Let us now take a look at some other features of English compounds. Since many compounds we have investigated so far consist of two words, as, for instance, *moonlight*, you may have the impression that compounds consist of two elements, a left-hand element and a right-hand element. However, we have also seen in (45) above that there are compounds that consist of more than two words, as, for instance, *wildlife sanctuary*, which we should then describe as consisting of three elements: *wild*, *life* and *sanctuary*. But intuitively, you might also object to such an analysis by saying that *wildlife* is in itself a word and can be regarded as one element. Indeed, we can argue that when a compound like *wildlife sanctuary* is created, we first create the word *wildlife* and then combine this word with the word *sanctuary*. This analysis can be supported by our discussion of the order in which morphemes are combined with each other in section 3.4. We said that

normally, morphemes are attached successively, and not simultaneously, to each other. Further support for this analysis comes from the meaning of this compound, which is 'a sanctuary for wildlife' rather than 'a sanctuary for the life in the wild' (or something similar). To generalise, we can represent the structure of the compound *wildlife sanctuary* in the form of a tree diagram:

(48) wildlife sanctuary



The tree diagram in (48) shows that compounds like *wildlife sanctuary* can be described as binary structures, i.e. as entities with two structural units ('constituents'). The compound *wildlife* consists of *wild* and *life*, and *wildlife sanctuary* of *wildlife* and *sanctuary*. This allows us to state that, in general, compounds can be described as containing two constituents, the left-hand constituent and the right-hand constituent. Each of these constituents can be complex in itself. Given this structure of compounds, we may now ask which role each constituent plays in a compound and whether the roles of both constituents are equally important. To deal with this question, we will take a look at what contribution to the meaning and to the grammatical features of a whole compound each constituent makes.

We will first deal with the contribution in terms of meaning. Consider the meaning paraphrases of the compounds provided in (49) below:

(49) a. plant house 'a kind of house'
b. lawn tennis 'a kind of tennis'
c. chairlift 'a kind of lift'

The data in (49) show that if we want to describe the meaning of a given compound, we can paraphrase it by using 'a kind of' and the right-hand element. Let us now try to do the same paraphrases using the left-hand elements. The asterisks indicate that the paraphrases do not render the meaning of the compounds correctly.

(50) a. plant house *'a kind of plant'
b. lawn tennis *'a kind of lawn'
c. chairlift *'a kind of chair'

For instance, a *plant house* is not a kind of plant but a kind of house. This observation leads us to the insight that compounds can generally be interpreted in such a way that the whole compound denotes a subset of the entities denoted by the right-hand element. Thus, the right-hand element of a compound contributes the main information about the meaning, and can therefore be regarded as the more important element of the compound in terms of meaning.

In addition to being important in terms of meaning, the right-hand element is also important in terms of the grammatical information it contributes. Consider the data in (51):

(51)

compound	**inflected forms**	
message board	message boards	*messages board
windmill	windmills	*windsmill
crash-land	crash-landed	*crashed-land

The data in (51) show that if a compound is inflected, the inflectional suffix is attached to the right-hand element, and not to the left-hand one. This shows us that the right-hand element is more important than the left-hand element in determining the grammatical features of a compound, such as, for instance, its number.

The right-hand element is more important in yet another way. Compare the word-classes of both elements to the word-class of the whole compound in the examples below:

(52)

compound	**word-class of elements**	**word-class of the whole compound**
glasshouse	N N	N
colour-blind	N A	A
small talk	A N	N
deep-fry	A V	V

The comparison makes it clear that the word-class of the compound is always the same as the word-class of the right-hand element, no matter what word-class the left-hand element belongs to. This shows us that it is the right-hand element, and not the left-hand element that determines the word-class of the whole compound.

We can conclude from our discussion above that generally, compounds have one element that is semantically and grammatically more important than other elements. This element is called the **head** of a compound. As the data above reveal, in English compounds, the head is usually the right-hand element.

Let us now examine the left-hand elements of compounds, using *windmill* as an example. What role does the element *wind* play in this compound? Evidently, it describes what kind of *mill* is meant if compared with other types of mills, such as *water mill, paper mill, powder-mill, coffee-mill*, or some other kind of *mill*. Hence we can say that the left-hand elements of compounds describe or specify the heads of compounds, i.e. provide additional information about them. The left-hand elements are called **modifiers**. In general, we can conclude that structurally, English compounds can be described as consisting of a modifier and a head.

Besides examining the structure of compounds in terms of the elements they contain, we can also investigate the structure of compounds with respect to the word-class of these elements. For a start, try to figure out the differences between the following compounds in terms of the word-classes of their heads.

(53)

a.	b.	c.
ash-tray	colour-blind	to housekeep
fast-food	dark-blue	to deep-fry
playground		to crash-land
overweight		

Obviously, the compounds in (53a) have nouns as their heads, whereas the compounds in (53b) have adjectives as their heads and those in (53c) verbs. Since we now know that the head of a compound determines the word-class of the whole compound, we can make the generalisation that mainly words of three word-classes can be produced by compounding in English: nouns, adjectives and verbs. Therefore, we distinguish between three major types of compounds: **nominal**, **adjectival** and **verbal compounds**.

Another observation about the structure of compounds in (53) can be made if we consider the word-classes of their modifiers. You might have noticed that in nominal compounds, the modifiers can be nouns, adjectives, verbs and prepositions. By contrast, in adjectival compounds in (53b), the modifiers can be nouns and adjectives but not, for instance, prepositions. In general, within each type of compounds in (53), certain combinations of word-classes are attested, whereas other combinations are not. This is summarised in the following table, where the rows indicate the word-class of the modifiers of the compounds given, and the columns show the word-class of the heads of these compounds. The table shows, for instance, that there are compounds in English which consist of a noun and an adjective, such as *colour-blind*, where the noun *colour* is the modifier and the adjective *blind* is the head.

(54)

	Noun	**Adjective**	**Verb**
Noun	morning paper	colour-blind	to housekeep
Adjective	fast-food	dark-blue	to deep-fry
Verb	playground	–	to crash-land
Preposition	overweight	–	–

The examples in (54) represent the most common structural patterns of English compounds. However, the patterns in (54) differ considerably in terms of their productivity. Whereas NN compounding is the most productive pattern in English, VV compounding is extremely rare.

In the present section we have examined one common way of creating new words in English, compounding. We have seen that compounds have a number of interesting properties. Orthographically, they can be spelled together, separately, and with a hyphen. Phonologically, they exhibit a specific stress pattern. They are normally stressed on the left-hand element. Structurally, compounds generally consist of a head, the element that bears the crucial semantic and grammatical information about a compound, and a modifier, the element that describes the head. Finally, we have seen that the structure of compounds can also be described in terms of the word-class of the modifier and the head. According to the word-class of the head, English compounds can be subdivided into three major groups: nominal, adjectival, and verbal compounds. In the next section we will take a look at another productive word-formation process in English, conversion.

3.7.4 Conversion

The processes of compounding and affixation regarded so far are called **concatenative processes**, because they follow the principle of adding some morphological material to a given form. However, there are also processes that do not follow the principle of concatenation. One of the most productive **non-concatenative processes** in English, especially for the derivation of verbs, is illustrated in (55):

(55)

	base		**derivative**
a.	a cage	→	to cage
	a gesture	→	to gesture
	water	→	to water
b.	to coach	→	a coach
	to bore	→	a bore
	to flirt	→	a flirt

c.	miserable	→	the miserable
	professional	→	a professional
	comic	→	a comic
d.	pale	→	to pale
	empty	→	to empty
	clear	→	to clear

In (55), the words on the right are derived from the words on the left by means of changing the word-class, without any change in form. This word-formation process is called **conversion**. Some linguists call this process **'zero-derivation'** or **'zero-affixation'** because they suggest that in each of the cases in (55) a zero-affix is added, i.e. an affix which is not expressed by any overt linguistic material. For reasons of space, we will not enter this debate here but will simply call this process 'conversion'.

The examples in (55) illustrate four major types of conversion in English: noun-to-verb conversion in (55a), verb-to-noun in (55b), adjective-to-noun in (55c) and adjective-to-verb in (55d). Pairs such as those in (55) raise the interesting question of how we know which word is the base and which is the derivative. Why do we say that in *cage* (N) – *cage* (V) the direction of conversion is from noun to verb and not vice versa? One way of finding out is checking the history of the language. Bases naturally appear earlier and give rise to derivatives. For instance, in the *Oxford English Dictionary*, the first date of attestation for the noun *cage* is 1225, whereas for the verb it is 1577. This means that the noun appeared considerably earlier, and must therefore be the base. The second clue for determining the direction of conversion is the meaning of the words. Derivatives usually have more complex meanings than their bases and rely on their bases for their meaning. Thus, to explain the meaning of the verb *to cage* we need the noun *cage* since the meaning of the verb is 'to put into a cage'. In such a case, we can argue that the verb is semantically more complex, and should consequently be regarded as the derived word. Another criterion can be frequency of occurrence. Derivatives are usually less frequently used in language because they are semantically more complex, hence more specialised, and therefore less versatile in usage. For instance, *cage* as a noun occurs 966 times in the *British National Corpus* (a 100 million word collection of English texts), whereas *cage* as a verb occurs only once.

In conclusion, we have seen that new words can also be created by changing the word-class of a base word without any change in form. In order to establish the direction of conversion, a number of different criteria can be used, such as the date of first attestation, the complexity of meaning, and the frequency of occurrence of a given derivative and its assumed base.

3.7.5 Shortening

In addition to conversion, there is a whole array of other non-concatenative word-formation processes. In these processes new items are formed by deleting linguistic material instead of adding it. Such processes are generally labelled as 'shortenings', but there are different types of shortening depending on what and how we delete. We will start with a process which you might well be familiar with, the shortening of names. Try to specify how the derivatives in (56) are created. The acute accent indicates on which syllable the main stress falls.

(56)

base		**derivatives**
Patrícia	→	Pat, Trish
Alónzo	→	Al, Lon
Augústus	→	Aug, Guss

Obviously, the words on the right in (56) are created by means of deleting a part of the base word. Such a process is called **truncation**. We can also make an important observation on the part of the base that survives truncation. As the data in (56) show, most truncated names retain either the first or the main-stressed syllable. As you probably know from your own experience, truncation is highly productive with names as a means of expressing familiarity.

Besides names, other words can be truncated as well. Usually, truncated words other than truncated names are called **clippings**. Consider the following data and try to make observations on which part of the base survives in the derivatives. Again, the acute accent indicates the syllable with the main stress.

(57)

base		**derivative**
dóctor	→	doc
véterinary	→	vet
labóratory	→	lab
advértisement	→	ad
examinátion	→	exám
celébrity	→	celéb
exécutive	→	exéc

Several interesting observations can be made on the basis of the data in (57). First, most clippings in (57) are monosyllabic or disyllabic words. Second, usually the first part of the base survives in the clipping. In many cases, it is just the

first syllable that survives, as in *advértisement* → *ad*. In some cases, it is the first and at the same time the stressed syllable, as in *dóctor* → *doc* or *véterinary* → *vet*. Similarly to name truncations, clippings often express the speaker's familiarity with the concept they denote.

Another type of shortening is illustrated in (58):

(58)

bases		**derivative**
motor+hotel	→	motel
breakfast+lunch	→	brunch
smoke+fog	→	smog
situation+comedy	→	sitcom
parachute+troops	→	paratroops

The examples in (58) are created by two processes: deleting parts of both bases or of only one base, and combining the remaining parts into a new word. Such words are called **blends** since the remaining parts are 'blended', i.e. mixed together. Blending is similar to clipping since it involves deletion. However, in blends two bases are used, whereas in clippings only one base is used.

As you can infer from the examples, usually the first part of the first word and the last part of the second word are combined in a blend. Thus, in *brunch* it is *br-* from *breakfast* and *-unch* from *lunch*. In some cases, as in *paratroops*, parts of only one base are deleted (*parachute* → *para*), whereas the other base, *troops*, enters the blend without deletion.

The following words are also formed by shortening, although of a different type:

(59)

	bases		**derivative**
a.	United Kingdom	→	UK
	Member of Parliament	→	MP
	portable document format	→	PDF
	digital video disc	→	DVD
b.	North Atlantic Treaty Organisation	→	NATO
	National Aeronautics and Space Administration	→	NASA
	Test of English as a Foreign Language	→	TOEFL
	lightware amplification by stimulated emission of radiation	→	laser

The examples in (59) are also formed by deletion and, similarly to blends, involve more than one word. In fact, most of them involve multi-word combinations. However, in contrast to blends and clippings, the deletion in the examples

in (59) is not based on the phonological structure of words, but purely on orthography. Moreover, deletion is more radical, in that the bases in (59) are stripped down to their initial letters. Words formed by combining only the initial letters of multi-word combinations are called **abbreviations**. There are two types of abbreviations, as you can see in (59). In the examples in (59a), the initial letters are combined and pronounced as a sequence of letters, in the way in which you spell the letters in the alphabet: UK [juːˈkeɪ], MP [emˈpiː], etc. Such words are called **initialisms** (since the 'initials' are pronounced). The examples in (59b) are pronounced as regular words, i.e. following the regular reading rules of English, as, for example, NATO [ˈneɪtəʊ] or NASA [ˈnæsə]. The technical term for such words is **acronyms**.

In the present section we have seen that new words can also be created by shortening, a word-formation process involving deletion of linguistic material. It has been shown that shortening can be done in a variety of different ways. In clippings and name truncations, a part of a base word is deleted. Blending involves deletion of a part of one base or of two bases and combining the remaining parts. In abbreviations, multi-word combinations are shortened to their initial letters. In spite of its variability, shortening is not a random process but follows certain regularities.

3.8 Conclusion

In the present chapter we discovered another core area of linguistics: morphology. Morphology deals with the internal structure of words and ways of creating new words. We have seen that words can be divided into smallest meaningful units called morphemes. Morphemes differ in a variety of characteristics, such as their ability to occur independently (free vs. bound), their function (inflectional vs. derivational), their position with respect to each other (root, base, affix), and their position with respect to the base (prefixes, suffixes and infixes). Using the inventory of different morpheme types, we are able to do a thorough morphological analysis of various complex words of a language. It was also shown that morphemes are abstract units that, depending on the context, acquire concrete shapes, called allomorphs. The distribution of allomorphs can be conditioned by a number of different factors, phonological, morphological and lexical. Finally, it was demonstrated that a number of different strategies can be used for creating new words, such as affixation, compounding, conversion and different shortening processes.

In the next chapter, we will move on to a higher level in the linguistic hierarchy and investigate how words are organised into sentences.

Further reading

For general introductions to morphology and morphological theory we recommend Aronoff and Fudeman (2011), Bauer (2003), Katamba and Stonham (2006) and Lieber (2010), which are all based on data from different languages, including English. Detailed introductions to English word-formation are provided in Bauer (1983) and Plag (2003). An overview of English word-formation processes can be found in Adams (2001) and Marchand (1969), both of which contain a great number of examples. For more advanced students, we recommend Bauer et al. (2013), which provides a comprehensive overview of inflection and word-formation in contemporary English and addresses some pertinent theoretical issues.

Exercises

Basic level

Exercise 3.1: Types of morphemes

Analyse the words below into constituent morphemes and identify the type of each morpheme (free or bound, root, base, affix (prefix or suffix), inflectional or derivational (for affixes)).

(60) premodernism uncivilised demilitarisation historicity
simpler manservant's recreated minimalists

Exercise 3.2: Morphological analysis of words

Analyse the morphological structure of the words below. Draw tree diagrams and provide arguments for your analysis.

(61) deformation refundable
disorganisation interdependency

Exercise 3.3: Allomorphs

Below you will find a number of English verbs in their past-tense form. Identify the allomorphs of the past tense morpheme. State the rules of their distribution and determine the type of conditioning.

(62) [staːtəd] [kɔːld] [pleɪd] [mɪst] [pækt]
[stɒpt] [pʊʃt] [ædəd] [ɹɒbd] [dɹægd]
[tiːzd] [nɪɪtəd] [beɪðd] [feɪdəd] [snɔːd]

Exercise 3.4: Word-formation processes

Identify the type of word-formation process by which the following words have been created. Explain in detail how they are derived.

(63)

telebanking	rosewater	to google	semi-circle
to narrow	Bart	hunter-gatherer	postmastership
radar	fire extinguisher	Chaplinesque	deforestation
job-hopper	PO	dorm	cosmonaut

Advanced level

Exercise 3.5: Restrictions on the productivity of affixes

The data below contain possible and impossible derivatives with the English suffix *-en*. Try to figure out the restrictions that rule out the impossible formations in (64b) and (64c). (Hint: the restriction has nothing to do with meaning).

(64)

a.	brighten	bright
	harden	hard
	fatten	fat
	strengthen	strength
	weaken	weak
b.	*calmen	calm
	*freeen	free
	*greenen	green
	*smallen	small
c.	*easien	easy
	*vividen	vivid
	*curiousen	curious
	*obedienten	obedient

Exercise 3.6: Directionality of conversion

The data below show some word-pairs created by conversion. For each word, the date of its first attestation in the English language, as documented in the *Oxford English Dictionary* (*OED*), and its frequency of occurrence in the *British National Corpus* (*BNC*) are given. Determine the directionality of conversion in each word-pair, using the criteria discussed in section 3.7.4. above. To do so, compare the two members of each pair in terms of a) their dates of first attestation as given in the OED, b) their frequency of occurrence in the BNC, c) their semantic complexity. Discuss on the basis of this comparison which member is more likely to be the base and which the derivative. If you encounter any problems, discuss them and their possible solutions.

(65)

	date of first attestation	**BNC frequency**		**date of first attestation**	**BNC frequency**
clean (A)	883	4591	to clean (V)	c1450	1576
sweet (A)	c825	2924	sweet (N)	1300	114
light (V)	c900	4357	light (N)	971	18853