

Chapter 4

Morphology: The Structure of Words

Morphology is the study of the internal structure of words; it examines how words can be broken down into meaningful parts and how new words are created in language.

Unlike allophones, phonemes, and syllables, which are elements of sounds, words consist of both phonological forms and also meanings (O'Grady et al. 2001). As we have learned in Chapter 1, the relation between form and meaning within a word is arbitrary. Thus, when we know a word, it means we know the conventional and arbitrary pairing between a particular sequence of sounds and a particular meaning.

A word can be defined as "the smallest independent unit of language" (Webster's Unabridged Dictionary 1989, cited in Fasold and Connor-Linton 2006:56). That is, it does not need to be attached to another unit when it appears in an utterance. For example, the form *book* is a word in English because it can occur by itself in various positions of a sentence depending on its grammatical function, as illustrated in (1).

- (1) a. A *book* is on the table.
b. Jane dropped the *book*.
c. Ray put the pencil on the travel *book*.

This is in contrast to non-word forms such as the past tense marker *-ed* and the progressive marker *-ing* in English, which are always attached to a verb and can never be separated from the verb to which they are attached when appearing in an utterance, as illustrated in (2) and (3).

- (2) a. Jane *dropped* the book.
b. Jane is *reading* the book.
- (3) a. *Jane *ed* drop the book.
b. *Jane is *read* the book *ing*.

Words which are formed simply by the mapping between form and meaning are called **basic words**. They typically include simple forms such as *pen, book, copy, at, the, phone, eat, and mouse*. Speakers know the basic words in their language. It has been estimated that a six-year-old child knows about 13,000 basic words, a high school student averagely knows 60,000 basic words, and a college graduate knows many more than that (Fromkin et al. 2007). All these basic words are stored in speakers' mental dictionary, usually referred to as the **lexicon** (the Greek word for 'dictionary'), which contains the information about the form, meaning, and some other properties essential to the proper use of a word in utterances (e.g., count noun, intransitive verb).

In addition to the basic words, countless other words are created by the application of a certain set of rules to the basic words (O'Grady et al. 2001). All

languages have rules for creating words; and speakers are capable of constructing and interpreting new words formed by the application of these rules. For example, a speaker of English who knows the basic word *copy* can readily construct and interpret other related words. These include *copied*, which is its past tense form, *copyist*, which refers to a person who makes written copies, and *copy machine*, which is a device for making photographic copies, etc. The number of these **complex words** is very large, and thus they cannot be all listed in the lexicon. In fact, speakers know the meanings of all these words by means of the knowledge of basic words, word parts, and the rules for their combination.

The component of the grammar which is concerned with words is called **morphology**. Generally, the study of morphology aims to understand speakers' knowledge about the internal structure and the formation of words. With this objective, linguists investigate what speakers know about the meaningful parts that constitute words and how speakers make use of the mental rules and processes to construct and interpret words and to account for the relationship between words in their language.

1. Classifying Components in Morphology



In many languages, a large number of words can be broken down into smaller components. The most fundamental component of word structure is the **morpheme**, which refers to "the smallest unit of language that carries information about meaning or function" (O'Grady et al. 2001:133). For example, the word *actions* can be divided into three separate morphemes, as presented in (4).

- (4) a. act
b. -ion
c. -s

Each of these morphemes contributes to the overall interpretation of the word. The morpheme *act* contains the meaning of 'do something'; the morpheme *-ion* specifies that the word functions as a noun with the meaning 'the process of doing something'; and the morpheme *-s* adds the meaning of 'more than one' to the word. Accordingly, the entire word is used to refer to 'two or more processes of doing something.'

Like words, morphemes are the arbitrary pairings between forms and meanings. Any sounds and sound sequences permitted in a language can be morphemes. Thus, a morpheme may consist of a single sound (*-s* in *actions*), one syllable (*act* in *actions*, *care* in *careful*), or two or more syllables (*bottle*, *alphabet*, *intelligent*). In all of these cases, a morpheme consists of a particular form (either a sound or a sequence of sounds) and a particular meaning joined together, and there is nothing intrinsic in such combination between the form and the meaning.

Based on the number of morphemes they are made up of, words can be broadly categorized into two classes. **Simple words** (or **basic words**) consist of a single morpheme. For example, the words *fun* and *cold* are simple words. Each is composed of one morpheme and cannot be broken down into smaller meaningful parts. **Complex words**, on the other hand, are formed by combining two or more morphemes, each of which conveys a certain kind of information. Examples of complex words include *fun*s (*fun-s*), *coldest* (*cold-est*), *actions* (*act-ion-s*), and *replayed* (*re-play-ed*). Table 4.1 provides more examples of the two classes of words in English.

Table 4.1 Words and their morphemes
(Adapted from Fromkin et al., *An Introduction to Language* (2007), p. 77)

Number of morphemes	Examples
One morpheme	man, desire
Two morphemes	man-ly, desire-able
Three morphemes	man-li-ness, desire-able-ly
Four morphemes	gentle-man-li-ness, un-desire-able-ly
More than four morphemes	un-gentle-man-li-ness

1.1 Roots, Affixes, Bases, and Stems

Morphologically complex words are typically composed of a root morpheme and one or more affix morphemes. A **root** is the core of a word which carries the main component of the word's meaning. An **affix** is a morpheme that cannot stand alone and needs to be attached to a base. A **base**, in turn, refers to the form to which an affix is added.

The base for an affix does not always correspond to a word's root. In some cases, the base is also the root. For example, the root of the word *cats* is *cat*, which is the part of the word that carries the main meaning; *cat* is also the base to which the affix *-s* is added. That is, in the word *cats*, the unit *cat* is the root of the entire word and also the base for the affix *-s*. Similarly, in the word *walked*, the unit *walk* serves as the root and the base, since it is the content core of the word and also the base for the affix *-ed*. However, in other cases, the base can be larger than the root. For example, in the word

criticized, the unit *critic* is the root of the entire word *criticized*; and the larger unit *criticize* is the base for the affix *-ed*. Table 4.2 summarizes the differences in the morphological structure regarding the roots, bases, and affixes of the three words as discussed here.

Table 4.2 The root, base, and affix

Word	Morphological structure	
cats	Root: <i>cat</i>	It constitutes the semantic core of the word <i>cats</i> .
	Base: <i>cat</i>	It is the form to which the affix <i>-s</i> is added.
walked	Root: <i>walk</i>	It constitutes the semantic core of the word <i>walked</i> .
	Base: <i>walk</i>	It is the form to which the affix <i>-ed</i> is added.
criticized	Root: <i>critic</i>	It constitutes the semantic core of the word <i>criticized</i> .
	Base: <i>criticize</i>	It is the form to which the affix <i>-ed</i> is added.

When a root combines with an affix, it forms a **stem**, which may or may not be a word (Fromkin et al. 2007). For example, when the root *interview* combines with the affix *-ee*, the resulting unit *interviewee* is a stem and also a word. In contrast, when the root *fer* combines with the affix *-ee*, the newly formed unit *ferree* is only a stem, not a word. Once a stem is formed, other affixes may be added to it to create a more complex stem, as illustrated in (5).

(5) a. root	interview
stem & word	interview + -ee
stem & word	interview + -ee + -s
b. root	fer
stem	fer + -ee
stem & word	re- + fer + -ee
stem & word	re- + fer + -ee + -s

From all the discussion above, we can see that although roots, bases, and stems are different concepts, they in fact overlap. They can be generally used to refer to the unit to which an affix is attached. We can thus define them in a more related manner as follows:

Root:	The core of a word which carries the main component of its meaning
Base:	The form (either a root or a stem) to which an affix is attached
Stem:	The form produced by combining an affix with a root or a base

Due to some overlap between the three concepts, it is possible to find a single unit which can be a root and a base, or a stem and a base. For example, the unit *cat* in the word *cats* serves as both the root (the content core) and the base (for the affix *-s*); and the unit

referee in the word *referees* functions as both the stem (formed by combining the root *fer* and the two affixes *re-* and *-ee*) and the base (for the affix *-s*).

1.2 Free and Bound Morphemes

Morphemes can be classified according to whether or not they are independent. A morpheme that can be used as a word by itself is called a **free morpheme**. In contrast, a morpheme that cannot stand alone as a word and must be attached to another element is referred to as a **bound morpheme**. In the word *cats*, for instance, there are two morphemes. The morpheme *cat* is free since it can be used as a word on its own; the plural morpheme *-s* is bound because it has to be attached to a noun base such as *cat* in order to form a word.

(6) cats: cat + -s
cat: free
-s: bound

While bound morphemes are usually affixes (such as the plural marker *-s*), not only affixes can be bound. A small number of roots cannot be used as words by themselves; they can appear as words only when they are combined with one or more affixes. For example, the root *fer* meaning 'to carry, to bring' is a bound morpheme; it must be combined with certain affixes in order to appear as words, as in *transfer*, *defer*, *infer*, and *refer*. Other examples of this sort of roots include *in-ept*, *venge-ance*, and *salv-ation*. The roots in all these words never stand alone as words by themselves, and thus they are known as **bound roots**.

1.3 Content and Function Morphemes

Moreover, morphemes can also be classified according to the kind of information they are associated with. A morpheme that contains some semantic content is called a **content morpheme**. Morphemes of this type are generally of three groups:

1. Simple words that have particular meaning (e.g., *pen*, *cat*, *girl*)
2. Affixes that add particular meaning to their base (e.g., *pre-paid* means 'paid in advance' and *un-likely* means 'not likely')
3. Affixes that change the grammatical category of their base (e.g., *-ment* which turns verbs into nouns: *entertain* – *entertainment* and *-ful* which turns nouns into adjectives: *joy* – *joyful*)

On the other hand, a morpheme which serves mainly to provide certain grammatical function is called a **function morpheme**. Morphemes of this sort have little semantic content. They include the following two groups:

1. Simple words that are used to specify grammatical relations, such as determiner (e.g., *a*, *the*, *this*), conjunctions (e.g., *and*, *but*, *or*), and prepositions (e.g., *in*, *on*, *at*)

2. Affixes that mark the grammatical function of their base (e.g., the plural morpheme *-s*, which marks the plural form of nouns and the past tense morpheme *-ed*, which indicates the past tense form of verbs)

1.4 Prefixes and Suffixes

There are two major types of affixes depending on their position in respect of the base. An affix that precedes a base is called a **prefix**. To form the word *replay*, for example, the prefix *re-* is added to the front of the base *play*. In contrast, an affix that follows a base is called a **suffix**. One example is the suffix *-s*, which is attached to the end of a base, as in the word *cats*. Table 4.3 provides more examples of prefixes and suffixes in English.

Table 4.3 Some English prefixes and suffixes

Prefix	Suffix
un-happy	wash-able
hyper-sensitive	young-est
semi-conscious	pain-ful
counter-act	kind-ness
mal-treat	brave-ly
super-man	look-ed

1.5 Derivation and Inflection

Affixes, both prefixes and suffixes, can be further divided into two types. One type, called a **derivational affix**, is used to create a new word which has a meaning and/or grammatical category different from that of its base. Words derived by the addition of affixes of this type become independent lexical items. That is, they are full words on their own. This is reflected by the fact that such derived words are typically listed separately from their base in a dictionary.

There are a large number of derivational affixes in English. Table 4.4 contains examples of English words formed by the derivational prefix *in-* and the derivational suffix *-ion*. The prefix *in-* is attached to an adjective to form a new adjective with the meaning of 'a negative, an opposite, or a lack'; the suffix *-ion* converts a verb into a noun and adds the meaning 'the process of doing something' to the base.

Table 4.4 Some derivational affixes

Adjective base	Derived adjective	Verb base	Derived noun
definite	indefinite	act	action
formal	informal	elect	election
edible	inedible	meditate	meditation
sensitive	insensitive	complete	completion
adequate	inadequate	appreciate	appreciation

As illustrated in the table, derivational prefixes in English typically change the meaning of a word without altering its grammatical category whereas many derivational suffixes

in the language can change both the meaning and the category of the base (see more examples of derivational affixes in English in Section 2).

The other type of affix, called an **inflectional affix**, is used to create a new grammatical form of the word to which it is added. It does not change either the central meaning or the grammatical category of the base. Forms produced by inflectional affixes are typically not full words on their own. Since inflectional affixes create a new form of a word, not a new word, words containing affixes of this sort are not considered independent lexical items. Accordingly, they are usually listed in dictionaries in the same entry as their base.

For example, the inflectional suffix *-s* in English simply produces the plural form of a noun base. The word *cat* is a noun. The new form produced by the addition of this suffix, i.e., *cats*, is still a noun and has the same central meaning as the base; it represents the plural form of the word *cat*. Likewise, the inflectional suffix *-ing* creates the progressive form of a verb base. Forms made by the addition of this suffix, such as *singing* and *walking*, remain verbs and still denote the same type of action as the bases. As a result, both the plural form *cats* and the progressive forms *singing* and *walking* are listed in dictionaries under the same entry as their base.

While many derivational affixes are found in English, there are only eight inflectional affixes in the language. All of the English inflectional affixes are suffixes, as presented in Table 4.5.

Table 4.5 The inflectional affixes of English

Function	Affix	Base	Example
3 rd per. sing. present	<i>-s</i>	verb	walks, touches
Progressive	<i>-ing</i>	verb	walking, touching
Past tense	<i>-ed</i>	-verb	walked, touched
Past participle	<i>-ed, -en</i>	verb	has walked, has touched
Plural	<i>-s</i>	noun	books, pens
Possessive	<i>'s</i>	noun	Jane's book, John's pen
Comparative	<i>-er</i>	adjective, adverb	slower, faster
Superlative	<i>-est</i>	adjective, adverb	slowest, fastest

As shown in the table, the inflectional suffixes provide certain grammatical function to their bases. On verb bases, they are used to mark tense, aspect, and number. On noun bases, they serve to mark number and (possessive) case. On adjective and adverb bases, they function to indicate degree.

Other Differences between Derivational and Inflectional Affixes

Apart from the major differences regarding the meaning and category of a base, derivational affixes also differ from inflectional affixes in terms of productivity. Usually, an inflectional affix can combine with most of the words belonging to the appropriate category. For example, the suffix *-s* can combine with virtually all count nouns, with a

very small number of exceptions (*men* and *mice*). However, a derivational affix is not allowed such freedom of combination. It can usually combine with a restricted group of words of the appropriate category. For example, while the suffix *-less* can convert nouns into adjectives with the negative meaning, a large number of nouns cannot occur with this suffix.

- (7) a. senseless
b. shameless
c. useless
d. childless
e. homeless

- (8) a. *pollutionless
b. *sympathyless
c. *familyless
d. *knowledgeless
e. *conditionless

Derivational and inflectional affixes can co-occur within the same words. In English, there is typically only one inflectional affix per word while a word can be composed of several derivational affixes. Thus, many complex words in the language consist of one inflectional affix and one or more derivational affixes. In these cases, a derivational affix always precedes an inflectional one; it combines with the base before an inflectional affix does.

For example, the word *nationalities* is composed of two derivational suffixes (*-al* and *-ity*) and one inflectional suffix (*-s*). The derivational suffixes are closer to the root *nation*. This linear order suggests that the two suffixes successively combine with their base to create the form *nationality*, which finally serves as the base for the inflectional suffix *-s*. Likewise, the word *activated* results from adding two derivational suffixes (*-ive* and *-ate*) and one inflectional suffix (*-ed*). The derivational suffixes, which are closer to the root of the word *act*, are first attached to create the form *activate*, which then becomes the base for the inflectional suffix *-ed*. The steps of adding the two types of affixes in these sample words are illustrated in (9) and (10).

- (9) a. nation
b. nation + -al
c. national + -ity
d. nationality + -s
e. = nationalities

- (10) a. act
b. act + -ive
c. active + -ate
d. activate + -ed
e. = activated

The differences between derivational and inflectional affixes that have been discussed are presented in Table 4.6.

Table 4.6 Differences between derivation and inflection

Derivational affix	Inflectional affix
<ul style="list-style-type: none"> • It is used to create a new word, which usually becomes an independent lexical item. • It changes the central meaning and/or the grammatical category of the base. • It is less productive; it can be attached to a restricted class of words belonging to the appropriate category. • It is combined with the base before an inflectional affix. 	<ul style="list-style-type: none"> • It is used to create a new form of word, which is usually not an independent lexical item. • It does not change either the central meaning or the category of the base. • It is more productive; it can be attached to virtually all words belonging to the appropriate category. • It is combined with the base after a derivational affix.

1.6 Conclusion of Morpheme Classification

All in all, morphemes can be divided into different types, based largely on their ability to stand alone as words and the information they are associated with. Table 4.7 summarizes the classification of morphemes as discussed so far in the section.

Table 4.7 The classification of morphemes

<i>Morphemes</i> The smallest units of language that carry information about meaning or function	
<p>Content morphemes Morphemes with semantic content</p> <ul style="list-style-type: none"> - Free content morphemes Content morphemes that can stand alone, e.g., <i>house, cat</i> They are the root of words. - Bound content morphemes Content morphemes that cannot stand alone <ul style="list-style-type: none"> - A few are the root of words (e.g., <i>fer</i>). - Most of them are (derivational) affixes (e.g., <i>re-</i>, <i>-ment</i>). 	<p>Function morphemes Morphemes with grammatical function</p> <ul style="list-style-type: none"> - Free function morphemes Function morphemes that can stand alone, e.g., <i>the, and, at</i> They are the root of words. - Bound function morphemes Function morphemes that cannot stand alone They all are (inflectional) affixes (e.g., <i>-s, -ed</i>).

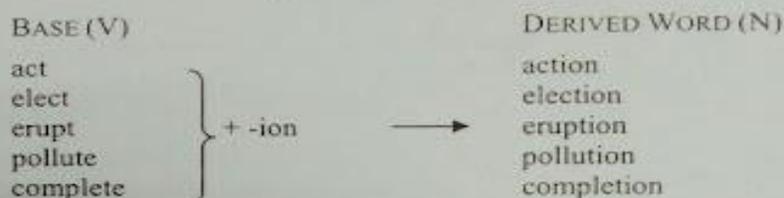
2. The Internal Structure of Words

Morphemes within words are not randomly combined. In fact, they are arranged to form words in very systematic ways. Stewart, Jr. and Vaillette (2001) pointed out that there are two facts about the addition of affixes to their base, which reflect the systematic and consistent nature in the way morphemes are combined to create words. First, the base to which a given affix is attached normally belongs to the same grammatical

category. Second, the word produced by the addition of a given affix also normally belongs to the same grammatical category.

For example, the suffix *-ion* in English is typically attached to verbs. The bases to which this suffix can be attached are all verbs; these include *act*, *elect*, *erupt*, *pollute*, and *complete*, etc. The words created by the addition of this suffix are nouns. Thus, the words *action*, *election*, *eruption*, *pollution*, and *completion*, which result from combining the suffix with a verb base, are all nouns. Figure 4.1 shows the consistent pattern of the suffix *-ion*.

Figure 4.1 The suffix *-ion*



These examples indicate that words have an internal structure. There are some rules or patterns which govern the organization of morphemes into words. In this section, we will study the internal structure of words in detail.

2.1 Analyzing the Internal Structure of Words

The two facts about the addition of an affix to a base are very useful in explaining the formation of words. That is, we can depend on the patterns of affixes to determine the steps of forming a word. By observing the grammatical category of the base and of the derived word, we can identify the proper order of each affix that a word combines with.

For example, the word *reelection* is composed of three morphemes: the prefix *re-*, the root *elect*, and the suffix *-ion*. In order to determine the steps of creating this word, we first need to know the patterns of the two affixes. The prefix *re-* is usually attached to verbs and the resulting words are also verbs (e.g., *react*, *redo*, *replace*, and *replay*). The suffix *-ion* is usually attached to verbs and the resulting words are nouns (e.g., *action*, *eruption*, *pollution*, and *completion*). Then, we can make use of these patterns to decide how the word is created. The first step is to attach the prefix *re-* to the verb base *elect*; this creates the new verb *reelect*. The second step is to attach the suffix *-ion* to the new verb base, yielding the noun *reelection*. The order of these steps cannot be reversed. If we started by combining the base *elect* with the suffix *-ion*, the derived noun *election* could not be combined with *re-* since this prefix is usually attached to verbs, not nouns. The steps of forming the word are presented in (11).

- (11) a. elect
b. re- + elect
c. reelect + -ion
d. = reelection