

MORPHOLOGY – A REFERENCE MANUAL FOR BA STUDENTS OF ENGLISH

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MORPHOLOGY – GENERAL INFORMATION

What is morphology?

English dictionaries typically give 3 definitions of ‘morphology’:

- the study of the morphemes of a language and of the way in which they are joined together to make words
- the scientific study of the form and structure of animals and plants
- the structure of an object or system or the way it was formed

Naturally, the first definition is the one we’re interested in. In fact, we can simplify this definition a bit and say that morphology is the study of the structure of words.

This definition implies that words have structure, but clearly this is not always the case: it would (at least at this point) make little sense to say that words like *wall*, *desk* or *window* have any visible structure. These are examples of simple words.

Morphology normally deals with *complex* words, i.e. words composed of at least two components, called *morphemes*.

Introductory exercise: Using your general knowledge/common sense, decide whether the following words are simple or complex (sometimes the answer may not be clear-cut, which means that you can viably argue both ways)

- *write*
- *writer*
- *number*
- *remake*
- *replenish*
- *research*
- *breakable*
- *tolerable*
- *available*
- *misunderstand*
- *mislead*
- *mistake*
- *days*

WORD

Since morphology is the study of the structure of words, it is essential to define ‘word.’

The term ‘word’ doesn’t really have a universally agreed-upon definition. Hence, linguists define ‘word’ in different ways depending on what exactly is meant.

The simplest definition of a word is that of the **orthographic word** – a word preceded by a blank space and followed either by a blank space or a punctuation mark

The **phonological word** is the speech equivalent of the orthographic word. It is a word that can be preceded and followed by a pause.

In the sentence *I’m reading a book* there are 4 orthographic and phonological words.¹

The definitions of orthographic word and phonological word are of little relevance to us. The terms that are important to us are **lexeme** and **word-form**.

Lexeme is a concept representing the core meaning of the word a shared by a set of closely-related word-forms. Lexemes are what is listed in dictionaries.

Word-forms are concrete representations of lexemes. Word-forms is what we use to build sentences so that they are grammatical

“Lexeme” is effectively a more technical term for what we normally mean by “word.” If we tell someone that they should be more careful with words, or that they should use different words, what we mean is lexemes (not word-forms).² However, if you want to use the verb *run* in the present perfect tense and say “ran” instead of “run”, your grammar teacher will tell you to use a different form of the verb (hence, a different word-form).³

Let us illustrate this with the lexeme *take*:

[TAKE]	lexeme	
take		
takes		
taking		
took		
taken		

} word-forms

We see that *take*, *takes*, *taking*, *took* and *taken* are word-forms of the lexeme *take*. The set of word-forms belonging to a lexeme is called **paradigm**.

Take is an irregular verb and as such its paradigm is richer than that of regular verbs, such as *walk*:

¹ This is of course purely theoretical as we don’t normally make pauses in between words while speaking.

² In the rest of this document, the term word is used synonymously with the term lexeme.

³ The concept of **lexicon** should also be introduced at this stage, although it is not easy to understand immediately. Essentially lexicon is the collection of all lexemes (i.e. words) in a language, together with word formation rules and patterns (these are discussed in much of the rest of this document).

[WALK] lexeme
 walk
 walks
 walking
 walked } word-forms

Walked can function as past tense and past participle word-forms. This situation (where a single word-form performs two grammatical functions) is called **syncretism**.

Morphology textbooks use the term **grammatical word** to refer to a single function of a word-form. *Walked* is a single word-form, but it can become two separate grammatical words.

Let us also take a look at noun and adjective paradigms:

[QUICK]	[TABLES]	[GOOD]
quick	table	good
quicker	tables	better
quickest		best

The word forms *better* and *best* are unrelated to *good*. This phenomenon is referred to as **suppletion**. *Go-went* is another classic case of suppletion.⁴

exercises

1. Comment on the problems you encounter in determining the number of words in the following nursery rhyme. Relate your answer to the different senses in which the term ‘word’ is used.

The grand old Duke of York
 He had ten thousand men.
 He marched them up to the top of the hill,
 Then he marched them down again.
 When they were up, they were up,
 And when they were down, they were down,
 And when they were only half way up
 They were neither up nor down.

Orthographic words =
 Word-forms =
 Lexemes =

2. Which of the italicised word-forms in the following sentences belong to the same lexeme? What difficulties, if any, have you come across in determining whether word-forms belong to the same lexeme?

1. She *saw* him *saw* through that plank of wood.
2. *Bill* will pay the *bill*.

⁴ Suppletion generally comes in two forms: strong and weak suppletion. In strong suppletion, word forms of the same lexemes are radically different (*go-went* is a case of strong suppletion); in weak suppletion, the difference is not so radical (*bring-brought* is a case of weak suppletion).

3. I saw the *farmer* near the *farm* again this morning.
4. I am *sick* of your claiming to be *sick* all the time.
5. I was looking at the *book* when she *booked* the ticket.
- 6 My *demanding* teacher has *demand*ed that I do extra work.
7. John sat by an *open* book. He was very *open* about what had happened the previous day.
- 8a. It all happened very *quick*.
- 8b. Don't be so *quick* to jump to conclusions.

3. Think of cases of syncretism in noun, adjective and adverb lexemes.

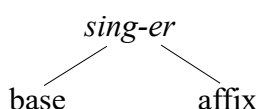
MORPHEME

We have already established that a word such as *singer* is composed of two elements (*sing* and *-er*). These elements are referred to as **morphemes** (smallest units that have a meaning or serve a grammatical function in a language).

It should be immediately evident that some morphemes can stand on their own, whereas some cannot. The former are **free morphemes** while the latter are **bound morphemes**.

Let us now familiarize ourselves with some more terminology necessary to carry out morphological analysis.

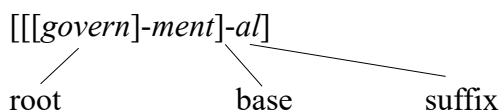
Singer is composed of a free morpheme *sing* and a bound morpheme *-er*. *Sing* is what we call a base ; *-er* is an affix.



Affixes that follow the base are called **suffixes** (*-er* is a suffix); affixes that precede the base are called **prefixes** (e.g. *un-* in *undo* or *re-* in *remake*).

Bases can itself be complex, as is the case with *governmental* where the suffix *-al* attaches to the complex base *government*. Bases are effectively any units to which we can add affixes.

Bases that cannot be decomposed further are called **roots**. In *singer*, the base is at the same time the root. In *governmental* the base is *government*, while *govern* is the root.



Roots are typically free morphemes, but can also be **bound**, as is the case with such roots as *sanct-*, *tox-* or *loc-*.

<i>sanct-</i> ‘holy’	<i>tox-</i> ‘poison’	<i>loc-</i> ‘place’
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<i>sanct-ify</i>	<i>tox-in</i>	<i>loc-al</i>
<i>sanct-um</i>	<i>tox-ic</i>	<i>loc-al-ity</i>
<i>sanct-uary</i>	<i>tox-ic-ty</i>	<i>dis-loc-ate</i>
<i>sanct-ity</i>	<i>in-tox-ic-ate</i>	<i>loc-um</i>

A special group of bound roots are roots such as *-duce* (found in e.g. *reduce*, *produce* or *deduce*):

<i>-ceive</i>	<i>-gress</i>	<i>-scribe</i>	<i>-tect</i>
<i>-cur</i>	<i>-ject</i>	<i>-serve</i>	<i>-tract</i>
<i>-duce</i>	<i>-mand</i>	<i>-side</i>	<i>-trude</i>
<i>-fer</i>	<i>-mit</i>	<i>-spect</i>	<i>-vert</i>
<i>-fine</i>	<i>-pand</i>	<i>-spire</i>	<i>-vade</i>
<i>-form</i>	<i>-port</i>	<i>-sume</i>	<i>-vide</i>

These roots differ from roots such as *loc-* as they do not have a recognizable meaning. Their root status can in fact be disputed.

A similar concept is that of **cranberry morphemes**, which are bound morphemes that don't have an actual meaning and that are limited to one word. They are called cranberry morphemes because a typical representative is found in the noun *cranberry* (*cran-* doesn't really have any meaning). Other examples include *ruth-* in *ruthless* or *reck-* in *reckless*.

INFLECTION AND DERIVATION

Affixation processes (that is, processes involving attaching affixes to roots and bases) are divided into two main categories, called **inflection** and **derivation**. Inflection is an addition of an affix to a word in order to mark grammatical features such as number, person or tense, e.g. *dogs*.⁵ This can also be done by changing the form of a word, e.g. *spoke*.

Derivation, on the other hand, is the process of forming new words from existing words by means adding affixes to the latter, e.g. *singer*, *undo*.

The main difference between inflection and derivation is that the latter names new concepts, whereas the former does not. Derivation also frequently involves a change of lexical category, as is the case with *singer* (but not with *undo*; prefixation does not change the lexical category).

Inflection, unlike derivation, is also obligatory. If I want to say that something can be done, I can use this exact phrase and say *This can be done*, or I can choose to say *This is doable* (you can stop at this point and think of more cases of this kind). But if I want to say *Jane spoke at the meeting yesterday* (using exactly this sentence), I need to inflect *speak* for past tense.

Finally, the difference between inflection and derivation can be seen as parallel to the one between lexemes and word-forms. Inflection forms word-forms from lexemes, while derivation forms lexemes from other lexemes. Again, paradigms are sets of word-forms (inflected forms).

This table contains the most common inflectional suffixes (taken from the Katamba textbook):

a.	Verbal suffixes	Function	Example
	-s	3rd person, singular, present	He snore-s
	-ing	progressive aspect (denoting action in progress)	He is snor-ing
	-ed	past tense	He snor-ed
b.	Noun suffixes		
	-s	noun plural marker	road-s
c.	Adj. suffixes		
	-er	comparative adjective/ adverb	slow-er, sooner
	-est	superlative adjective/ adverb	slow-est, soonest

The following is a list of suffixes deriving nouns from adjectives:

Adj	Noun
-ness	'forms a noun expressing state or condition': good-ness, fair-ness, bitter-ness, dark-ness
-ity	'forms a noun expressing state or condition': timid-ity, banal-ity, pur-ity, antiqu-ity
-ship	'state or condition of being X': hard~hardship
-ery	'having the property indicated by the adjective': brav-ery, effront-ery, trick-ery, chican-ery

⁵ Inflectional bases are called stems. *Dog* is the stem in *dogs*; *Government* is the stem in *governments*.

And these prefixes derive verbs from other verbs:

re- 'again'

re-think, re-take, re-play, re-examine, re-issue

dis- 'negative, reversive'

disallow, disagree, disapprove, dislike, disaffirm, disbelieve, disarm

un- 'reversive'

undo, unblock, unpack, unravel, unpick, unseat, unroll, unsaddle

For the comprehensive list of derivational suffixes, see Katamba, pp. 44–46 and for prefixes see Katamba pp. 42–43.

Sometimes, the same suffix can attach to words to perform different functions. This is the case with *-al* that can derive adjectives from nouns (e.g. *global, parental, emotional*) or nouns from verbs (*removal, portrayal, withdrawal*).

Also, sometimes a derivational suffix can fulfil different functions, even if it attaches to the same base. *-Ion* and *-ing* can derive process nouns or nouns that refer to objects:

John showed me his large collection of stamps. (= entity)

The collection of data took 3 years. (= process)

a building across the street. (= entity)

The building of the cathedral. (= process)

Finally, some suffixes can be both derivational and inflectional:

*John has only **limited** experience in management.* (derivation)

*Dangerous weather this spring has **limited** the number of days for climbers to reach the summit.*
(inflection).

The same can be said about the suffix *-ing*:

You keep worry**ing** me. (inflection)

a worry**ing** situation. (derivation)

-Ing can also derive nouns:

*Are we understand**ing** each other?* (inflection)

*She is a very understand**ing** person.* (derivation)

*Our understand**ing** of the universe.* (derivation)

Exercises

1. Identify the morphemes in the words below:

beds

unenthusiastically

servant

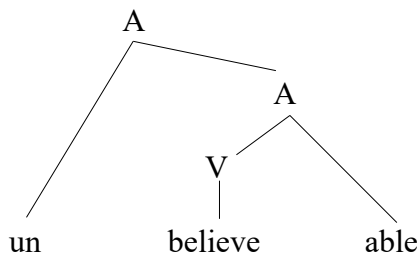
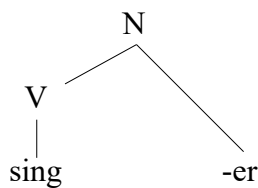
server

bipedal
expedition
accessible
possible
discover
disorder
displeasure
disease
curious
informative
creative

2.
 - a. List the meanings associated with the form *-er* in *teacher*, *Londoner*, *cooker*, *louder* and *merger*.
 - b. List all the meanings of the *-able* suffix and give examples.
3. Draw labelled trees to show the structure of the following words:

motherhood *re-examining* *unnaturalness* *disbelief* *mismanagement*
dislocation *underprivileged* *underrated* *untouchables* *unlockable*

Examples:



4.
 - a. List more cases of the suffix *-ed* attaching to a verb and giving rise to inflectional and derivational forms.
 - b. List more cases of the suffix *-ing* attaching to a verb and giving rise to inflectional and derivational forms.
5. Make a list of bound roots in English to which suffixes can attach.

LANGUAGE TYPOLOGY

Languages differ as regards how much inflection they have. English has relatively little inflection (hence, its paradigms are not very extensive). We call such languages **analytic languages**.

Polish, on the other hand, uses much more inflection. Consider the paradigm of the lexeme *czytać*:

[CZYTAĆ] – *czytam, czytasz, czyta, czytamy, czytacie, czytają, czytałem ..., przeczytałem...*

Languages that use a lot of inflection are called **synthetic languages**. Polish is a good example of a synthetic language. Germanic languages are also all synthetic, except for English. Because synthetic languages have larger paradigms, they involve fewer cases of syncretism than analytic languages.

Morphemes such as the Polish *-am* are referred to as **portmanteau morphemes**. They serve several grammatical functions at once. The suffix *-am* is the marker of the first person, the singular number and the present tense.⁶

An extreme case of an analytic language is an isolating language – a language that uses virtually no inflection. Vietnamese is one such language. In Vietnamese, one word corresponds to one morpheme:

Chúng	tôi	mua	ã	go
Pl.	I	buy	past	rice

‘We bought the rice.’

An extreme case of a synthetic language is a polysynthetic language. West Greenlandic can serve as example:

Paasinngilluinnarpara ilaajumasutit.

The above sentence is composed of just two words and means ‘I didn’t understand at all that you wanted to come along.’

⁶ The Katamba textbook uses the term portmanteau morph since Katamba makes the distinction (in my opinion confusing and unnecessary, especially at this stage) between morphemes and morphs (the phonological representation of a morpheme). Portmanteau morpheme is a term widely used in morphological literature.

SPECIAL AFFIXES

Apart from suffixes and prefixes, we can find the following affixes in the world's languages:

- **interfixes** are semantically empty affixes that occur between two morphemes, e.g. *gwiazd-o-zbiór*
- **infixes** are affixes inserted inside the base. The Ulwa language (spoken in Nicaragua) is one language that makes use of infixes:

suulu 'dog'

suu-ka-lu 'his/her dog'

- **circumfixes** are affixes which occur on both sides of the base. German uses them to inflect verbs for past tense:

ge-mach-t 'made'

There is also a special term for bound morphemes such the 's in *she's*. We call such things **clitics** – bound morphemes which are attached at the margins of words but which are not affixes.

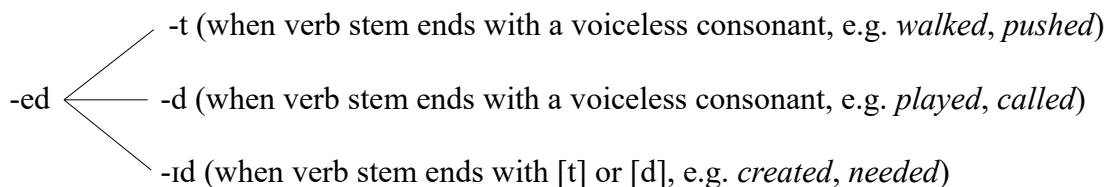
ALLOMORPHY

You may know from your phonology classes that the English sound [l] has three variants. It can be the standard, regular /l/ (as in *love*), it can be ‘dark’ (as in *mill*) or it can be voiceless (as in *play*). These three variants are allophones of the phoneme [l].

Morphology, too, has morpheme variants – **allomorphs**.

For example, the regular plural suffix *-s* in English can be voiceless (when it is attached to a noun/stem that ends with a voiceless consonant, e.g. *cats*), voiced (when it is attached to a noun that ends with a voiced consonant or a vowel, e.g. *dogs*, *teas*) or it can be pronounced as [ɪz] (when it attaches to a noun that ends with [s], [z], [ʃ], [tʃ], or [dʒ], e.g. *places*, *mazes*, *bushes*, *branches*, *badges*). The same applies to the suffix *-s* forming the 3rd person, sing. (*she walks*, *she plays*, *she pushes*).

A similar case of allomorphy can be observed with the regular past suffix *-ed*:



In the three cases above, the choice of an allomorph depends on the pronunciation of the stem. We say that in such cases we deal with **phonologically-conditioned allomorphy**.

In other scenarios, the choice of an allomorph depends on the individual lexeme. For example, when we form the plural of *child*, we add the suffix *-(r)en*. There is nothing about the phonology of *child* that dictates the use of this suffix; the choice of the suffix depends on the noun itself. We call this **lexically-conditioned allomorphy**.

The Katamba textbook uses the term “grammatically-conditioned allomorphy” to refer to cases where the second and/or third form of the verb is irregular (*drive* and *drove* is cited as an example of this grammatically-conditioned allomorphy). The difference between lexically and grammatically-conditioned allomorphy is rather superficial.

Allomorphy is usually discussed from the point of view of inflection, but we can also talk about allomorphy in derivation as well. As we know already, the suffix *-ing* can derive adjectives from verbs, e.g. *worry-worrying*, *intimidate-intimidating*, *demand-demanding*. But *-ing* is not the only suffix with this function. The verb *dismiss* takes *-ive* to form *dismissive*, and *regulate* takes *-ory* to form *regulatory*.

Exercises:

1. List all possible morphemes that derive deverbal process nouns, such as *-ing* and *-ion*.
2. List the allomorphs of the provided morphemes and determine whether they are phonologically or lexically conditioned.

A. /un-/ (this forms negated adjectives, e.g. *unhappy*)

B. /-er/ ‘a person who performs the action denoted by the verb’

C. /-ness/ ‘state or condition of being in a state denoted by the adjective’, e.g. *emptiness*

D. /-ify/ (this derives verbs from adjectives, e.g. *solidify*)

3. Find two more examples of “derivational allomorphy” (cases where two affixes fulfil the same function)

4. Study the following words and answer the questions that follow:

<i>alumni</i>	<i>vertebrae</i>	<i>automata</i>
<i>stimuli</i>	<i>larvae</i>	<i>phenomena</i>
<i>loci</i>	<i>algae</i>	<i>criteria</i>

A. All the words above have been imported into English from other languages. Where did they come from?

B. Write down the singular form of each noun.

C. Determine whether the selection of the appropriate plural allomorph in these words is phonologically or lexically conditioned.

PRODUCTIVITY

Examining complex words, we should be able to notice that some affixes occur in them more often than others. We say that such affixes are **productive**.

For example, *-ness* is a productive suffix in English. It is widely attached to adjective to form abstract nouns, e.g, *happiness, sadness, willingness, weakness, kindness, greatness, readiness, brightness, effectiveness, openness...* the list goes on and on.

On the other hand, *-th* is an unproductive suffix in English. It attaches only to a handful of adjectives: *warmth, strength, length, breadth, width, depth*.

We can talk about productivity from the point of view of how often affixes appear in existing words, but also how likely they are to form novel words.

Actual, possible and impossible words

When I leave home and forget to take my phone with me, I can say to a person I meet that “I'm phoneless right now”. *Phoneless* is a **possible** (or potential) word because it is formed by a productive, regular pattern (in this case the attachment of *-less* to a noun with the meaning ‘without’, which is a very productive pattern). A word like *pointless*, on the other hand, is an **actual** word (a word that is familiar to speakers).

A word such as *phoneless* is likely to be **occasionalism** – a newly coined⁷ word that is restricted to occasional occurrences.

When an occasionalism does become popular with speakers, it becomes a **neologism** (and with it an actual word). *Malware* is an example of a fairly recent neologism.⁸ New coinages become actual words through the process labelled **institutionalization**.

Sometimes language users consciously use an unproductive pattern to coin a new word. Normally we add *-ness* to *red* and say *redness*. But if I write a poem, I may choose to go with *-th* and form *redth* (as in *the redth of the sky*). **Creativity** is the term referring to the formation of new lexemes by unproductive patterns.

Exercise:

Study the following following affixes and determine whether they are productive or unproductive:

- ble* [able to be V-ed] *readable*
- ly* [forms adverbs from adjectives] *quickly*
- ity* [state or condition of being X] *diversity*
- ee* [person who undergoes action indicated by the verb] *employee*
- let* [a small N] *booklet*
- ish* [having the property of being somewhat A] *yellowish*
- hood* [quality, state, rank of being N] *parenthood*
- ful* [amount or volume contained in N] *handful*
- dis-* [not A] *dishonest*

⁷ Coining a word is another way of saying ‘creating a word’. Newly created (coined) words are **coinages**.

⁸ Neologisms, obviously, do not have to arise by affixation. They can be coined by processes described in later sections.

ex- [former] *ex-husband*
un- [reversive] *undo*
mis- [badly] *misunderstand*

Keep in mind that affixes do not have to be pigeonholed as productive and unproductive; they can be very productive (as is the case with *-ness*), reasonably productive, rather productive/unproductive, etc.

CONSTRAINTS ON AFFIXATION

Sometimes the attachment of a very productive affix fails. *-Ly* productively derives adverbs from adjectives; however, *-ly* is not attached to adjectives like *ugly* or *friendly*. If we added *-ly* to them, we would get *uglily* and *friendlily*, but these words would sound incredibly clumsy. If we need to use these adjectives as adverbs, we need to say *in an ugly/friendly way* (or find adverbs with similar meanings, e.g. *terribly*, *cordially*).

-Er is another productive affix deriving agent nouns from verbs. Nevertheless, *-er* is normally not attached to the verb *steal* because of the existence of the word *thief*. This phenomenon is known as **blocking**.

Affixation can also be subject to semantico-syntactic constraints. The prefix *un-* attaches only to transitive verbs (verbs that take an object) and to verbs denoting actions that can be reversed. Hence, we don't have **unsleep*, **undrive*, **unwalk*, etc. Similarly, the suffix *-ee* (which forms patient nouns from verbs, e.g. *employee*, *detainee*, *givee*) attaches only to transitive verbs, which makes something like **sleepee* impossible.⁹

Exercise

Which of the following English words are actual, possible and impossible?

replay, *overdepend*, *reknow*, *quickable*, *becomable*, *winteral*, *abundance*, *unable*,
decomputerization, *non-story*, *non-kind*, *unpessimistic*, *attacker*

⁹ Note that *drivee* and *walkee* are possible words in English. *Drive* and *walk* can function as transitive verbs (you can drive or walk a person somewhere).

CONVERSION (ZERO-DERIVATION)

One of the things we established at the beginning was that words such as *wall* do not have visible structure. But what if they had invisible structure?

In addition to being a noun, *wall* can also be used as a verb:

John walled up the treasure. (=John enclosed it within a wall.)

They walled an unused entrance.

The traditional way to account for such uses of *wall* is to propose that the verb *wall* is derived from the noun *wall* via the process called conversion (or zero-derivation). The process is represented as follows:

wall (n) + -Ø = *wall* (v)

Hence, the structure of the verb *wall* is composed of the root/base *wall* and a zero suffix (marked as Ø).

Other examples:¹⁰

dry (a) + -Ø = *dry* (v) (adjective-to-verb conversion)

walk (v) + -Ø = *walk* (n) (verb-to-noun conversion)

supernatural (a) + -Ø = *supernatural* (n) (adjective-to-noun conversion)

Not everyone believes that conversion is a real thing. Some people believe that noun *wall* and the verb *wall* exist independently and there is no derivational relationship whatsoever between them. I don't necessarily agree with this as there is evidence to the contrary (e.g. we can not only *wall* but *stone-wall* something; while this verb is used figuratively, it appears to have a nominal origin). Also, our textbook does discuss conversion so we may as well consider it to be an actual word-formation process.

Common (i.e. very productive) conversion patterns in English include:

- Turning verbs of motion into nouns (*walk, run, swim, dive, jog*, etc.)
- Turning nouns denoting tools/devices into verbs (*hammer, brush, phone, tape*, etc.)
- Turning adjectives used to describe people to collective nouns (*the poor, the blind, the homeless*, etc.)

Exercises

1. Which lexical category serves as the base in the following cases of conversion?

time *paint* *rain* *warm* *point*
worry *sleep* *empty* *rest* *wall*

¹⁰ English doesn't really have verb to adjective conversion (adjectives are derived from verbs by overt suffixation). Nouns that modify other nouns (e.g. *kitchen table*) form noun-noun compounds with them (more on this in the next section).

2. English words have a remarkable ability to function as more than one part of speech. Such is the case with many of the words in the sentences below. Find these words and comment on the “direction of derivation”.

- A) Chris had stood there smiling with his camera in hand, waiting for me as I exited the side of the stage.
- B) These days privacy online feels like an unattainable dream: everything you do becomes data for companies, which sell that data to affiliates, which then sell your data back to you in the form of targeted ads and personalized recommendations.
- C) The scientists shot a stream of electrons close to the nanowire, using them to image the standing wave of light.
- D) Kids who read on both books and iPads at home are more likely to perform at or above grade level in school.
- E) This low-cost model allows you to make a pile and then easily move the pen when you want to start a new pile or turn the old one.
- F) We know that children like to see other children on the screen, and in this case, they can also imitate their gestures.
- G) If there’s a bridge to be found between the massive political forces at work and these smaller, more personal connections, it’s in the episode’s closing sequence.
- H) Traditionally, viral content spreads by people sharing it from its original source and if it's caught early enough, cutting off the head of the snake can do a lot to slow it down.
- I) With a deliberate focus on inclusion of every school regardless of the state of its library, this document provides points of entry for everyone and a framework for growth.
- J) To better recognize the hand pose and to increase the robustness of the algorithm, a synthetic hand model is also generated over various backgrounds and is mapped to corresponding 3D coordinates.

3. Think of words in English that can be used as verbs, nouns or adjectives.

4. Think of complex words in English that can function of more than 1 part of speech.

COMPOUNDING

So far we've been dealing with complex words formed by affixation (combining bases and affixes). Complex words can also be formed by combining. We call this operation **compounding**. *Computer program* is an example of a compound.

Morphology makes a distinction between compounds and phrases. A *green house* is something different from a *greenhouse*. The latter is a compound; the former is not.

nominal compounds

Computer program is a compound composed of two nouns. Hence, it is a **noun-noun compound**.

The elements in noun-noun compounds are called the 'modifier' and the 'head':

computer program

modifier head

The head determines the lexical category of the compound. In the above example, the noun status of the head means that the compound is also a noun.

Widely used noun-noun compounds include:

phone call
ice cream
health care
family member
police officer
blood pressure
birthday party
law enforcement
market research
credit card

Noun-noun compounds are sometimes spelled as a single word:

mailbox
rainfall
haircut
postcard
windowpane
database

A wide range of semantic relationships are possible in noun-noun compounds. Some of the most common include:

- N2 is located at/in N1 (*kitchen table*, *hospital bed*, *bedroom floor*)
- N2 'happens' at the time N1 (*Christmas gift*, *birthday party*, *summer examination*)
- N2 uses N1 (*pendulum clock*, *steam engine*, *Windows computer*)

- N2 belongs to N1(*family estate, state hospital, company car*)
- N2 is made of N1(*brick house, clay pot, ice sculpture*)
- N2 resembles N1(*Blood Moon, mushroom cloud, pen-drive*)

Many compounds can be paraphrased with an *of*-phrase (e.g. *school director, city centre, church tradition*)

Noun-noun compounds are **recursive**; that means that they can be composed of more than 2 nouns:

health care reform
air quality management
health care reform bill
air quality management strategy

In theory, there is no limit as to the possible number of nouns in noun-noun compounds. However, very long compounds are very rare as they are difficult to process.

endocentric, exocentric and appositional compounds

Compounds like *computer program* or *kitchen table* are called **endocentric compounds**. Endocentric compounds are compounds with a semantic head (a kitchen table is a kind of table; *table* is a semantic head). Compounds without a semantic head are called **exocentric compounds**. Examples of exocentric compounds include compounds such as:

greenhorn (not a kind of horn)
killjoy (not a kind of joy)
pickpocket
copycat
white collar
loudmouth

Exocentric compounds typically include verbs and adjective as left elements (though exocentric noun-noun compounds are also possible, e.g. *bloodbath*). It doesn't make much sense to refer to them as modifiers though, as there is no semantic head to modify.

Compounds with two (semantic) heads also exist, e.g. *student-worker* (both a student and a worker), *singer-songwriter*, *actor-director*. We call them **appositional compounds**.

Endocentric noun-noun compounds are incredibly productive. In fact, any combination of two nouns can in theory serve as a noun-noun compound. Take a look at these:

mind computer
blackout helmet
escape suit

The above compounds have been used in sci-fi literature. It is not immediately obvious what they mean, but I suppose we could make some educated guesses. Again, such compounds are occasionalisms.

Exocentric compounds, on the other hand, are rather unproductive.

deverbal (synthetic) compounds

A head of a compound can be derived from a verb, producing a **deverbal** (or **synthetic**) compound.¹¹ Examples include *truck driver*, *watchmaker* or *book seller*. In these compounds, the left element is an object of the verb. Synthetic compounding is very productive. Most combinations of a transitive verb and its object can be viably turned into a synthetic compound.

phrasal compounds

There are compounds in which the role of a modifier is served not by a word, but a phrase. These are known as **phrasal compounds**:

wait-and-see approach
step-by-step guide
do-or-die mission
behind-the-scenes video
once-in-a-lifetime experience
very-hard-to-describe experience

Entire sentences can also function as modifiers in phrasal compounds:

She had a "I can't wait to get out of here" look on her face.

adjectival compounds and compound verbs

Adjectival compounds (or compounds adjectives) are compounds which function as adjectives. They can be headed by simple adjectives and *-ed/-ing* participles (i.e. passive and active participles); the latter are effectively synthetic compounds. They can also involve denominal heads.

sugar-free paper-thin century-long	}	examples of compound adjectives headed by simple adjectives
pencil-drawn hand-made hard-earned	}	examples of compound adjectives headed by passive participles
fast-growing good-looking easy-going	}	examples of compound adjectives headed by active participles
blue-eyed long-haired four-legged	}	examples of compound adjectives with a denominal head

Compound verbs include structures like *crash-land*, *kick-start*, *stir-fry*, *drip-dry* or *spoon-feed*.

¹¹ The Katamba textbook also gives structures such as *carving knife* or *sewing machine* as examples of deverbal compounds. However, when morphologists use the term 'deverbal compound', they usually mean 'synthetic compound' (that is, a compound whose head is deverbal).

neoclassical compounds

Compounds can be made up not only of words and free roots but also bound roots. Examples include *biology* or *geography*. They are called neoclassical because they involve Latin and Greek roots.¹²

Exercises

1. Which group do these compounds belong to?

<i>decision-maker</i>	<i>wide-ranging</i>
<i>law school</i>	<i>award-winning</i>
<i>cut-throat</i>	<i>living room</i>
<i>law-abiding</i>	<i>eye-opening</i>
<i>stoplight</i>	<i>poet-philosopher</i>
<i>centre stage</i>	<i>scarecrow</i>
<i>writer-producer</i>	<i>time machine</i>
<i>risk taker</i>	<i>tax payer</i>
<i>record-breaking</i>	<i>breakwater</i>
<i>drug use</i>	<i>forward-looking</i>
<i>job creation</i>	<i>lightning-fast</i>
<i>air pollution</i>	<i>turncoat</i>
<i>pitch-dark</i>	<i>lemon juice</i>
<i>family-friendly</i>	<i>ice-cold</i>
<i>razor-sharp</i>	<i>get-together</i>

2. Decide whether the following compounds are endocentric or exocentric.

- A) *difference maker*
- B) *head scratcher*
- C) *bread-winner*
- D) *award-winner*
- E) *thunderstruck*
- F) *storm-struck*
- G) *hand-washing*
- H) *brain-washing*
- I) *job-searching*
- J) *soul-searching*

3. Decide whether the following statements are true or false.

- A) The compound *undersea cable repair team* contains 4 morphemes.
- B) The compound *undersea cable repair team* is a noun-noun compound.
- C) In the compound *zero sum game*, the noun *game* functions as the head.
- D) *Food poisoning* is a deverbal compound.
- E) *Helpdesk* is an endocentric compound.

¹² This obviously makes it necessary for us to treat morphemes such as *bio-* and *-logy* as roots, and not affixes. Indeed, roots found in neoclassical compounds seem to have a more concrete meaning than bound "roots" such as *-duce* or *-ceive*.

- F) *Bittersweet* is an appositional compound
- G) In a deverbal compound whose head ends in *-er*, the head must be an agent noun.
- H) The suffix *-ing* can give rise to both adjectival and nominal deverbal compounds.
- I) The suffix *-ment* is found in deverbal compounds.
- J) Compounds in English can undergo conversion

SEMANTICS OF WORDS

Many words in English feature a substantial degree of **polysemy**; that is, they have a number of different, yet related meanings. The noun *bridge* is a good example:

- a structure built over a river or a road
- the part of a pair of glasses that rests on your nose
- a small piece of wood under the strings of a violin or guitar, used to keep them in position
- anything that provides a connection between two other things (often used figuratively)

Polysemy is a by-product of **semantic widening** of words – the process by which words acquire new meanings. The verbs *manage* and *manufacture* are classic examples of widening. The former used to mean ‘handle a horse’; the meaning of the latter was once restricted to ‘make by hand’.

A scenario where two different lexemes have the same form is not a case of polysemy, but **homonymy**. Homonyms are semantically unrelated lexemes that are written and spelt identically. For example, *bar* is homonym – it can mean ‘a long and straight piece of solid material’ or a counter or room where alcoholic drinks are served (in addition to other things, most of which are polysemous with the former definition). A similar concept is **homophony** – a situation where two distinct lexemes are spelt differently but pronounced in the same way, e.g. *sail* and *sale*.

The opposite of semantic widening is **semantic narrowing**. The textbook example is the word *deer*, which in Old English meant any four-legged wild animal.

Complex lexemes, too, can undergo semantic change or acquire new meanings. The adjective *forgettable* likely used to mean simply ‘that can be forgotten’, but today it is used to mean ‘boring or uneventful’ (and thus easily forgotten), such as a film or a party. We say that *forgettable* underwent the process called **lexicalization**, as a result of which it is increasingly perceived as one unit. In other words, the meaning of *forgettable* is much less compositional than the meaning of regular *-able* adjectives, e.g. *detectable*.

Exercises

1. Explain how the meaning of the following words might have changed:

computer
awful
approachable
cupboard
childish
insecure
replace
disappoint
business
commitment

2. Decide which of the words in a given set have a compositional meaning, and which have a non-compositional meaning. Then add one more word with a compositional and non-compositional meaning to each set.

- *disappointing, understanding, relaxing, promising, outgoing*

- *creative, disruptive, progressive, appreciative, offensive*
- *ability, popularity, integrity, complexity, majority*
- *clueless, hopeless, meaningless, speechless, restless*
- *helpful, useful, stressful, colourful, harmful*
- *educational, essential, natural, global, parental*
- *conversation, investigation, communication, revelation, vacation*
- *materialize, modernize, specialize, legalize, vaporize*
- *misunderstand, mislead, misplace, mistake, misread*
- *unpack, undo, unfold, unlearn, unearth*

LEVEL I & LEVEL II AFFIXES

There is a hypothesis in morphology that affixes are divided into ‘integrated’ and ‘neutral’ affixes (or ‘level I’ and ‘level II’ affixes). Examples of affixes belonging to each class are listed in the table below:

Level I affixes	Level II affixes
<i>-ity (modernity)</i> <i>-ical (theoretical)</i> <i>-ion (division)</i> <i>-ian (librarian)</i> <i>-al (parental)</i> <i>-y (photography)</i> <i>-ous (advantageous)</i> <i>-ive (permissive)</i> <i>in- (incompatible)</i>	<i>-ness (darkness)</i> <i>-y (grassy)</i> <i>-ize (theorize)</i> <i>-able (doable)</i> <i>-ful (</i> <i>-ism (</i> <i>un- (unpack)</i> <i>re- (re-establish)</i>

The main idea here is that Level I affixes are supposed to attach closer to the root; level I affixes can never attach after Level II affixes; hence we can't have e.g. **hopelessness*.

We are not going to discuss the specifics of this theory, if only because it is not universally accepted.

One thing that is useful for a student of English to know, however, is that some (level I) English suffixes are phonologically relevant – what that means is that they trigger a stress shift. The suffixes *-al* and *-ity*, for example, change the stress in the adjective (compared to the noun) or give the adjective a secondary stress:

parent /'peərənt/ – *parental* /pə'rentəl/
autumn /'ɔ:təm/ – *autumnal* /ɔ:'tʌmnəl/
detriment /'detrəmənt/ – *detrimental* /,detrə'mentəl/

creative /kri'eɪtɪv/ – *creativity* /,kri:ə'tɪvəti/
productive /prə'dʌktɪv/ – *productivity* /,prɒdʌk'tɪvəti/
monstrous /'mɒnstɹəs/ – *monstrosity* /mɒn'strɒsəti/

The same effect is observed with the suffixes *-ian* (e.g. *comedy* – *comedian*) or *-ous* (*advantage* – *advantageous*)

NON-CONCATENATIVE PROCESSES

One thing that inflection, derivation and compounding have in common is that they consist in **concatenation** – adding new elements on top of other components. Word-formation processes can also be **non-concatenative**. These include back-formation, blending, clipping, analogical formation, abbreviation and acronymization. This section gives a brief overview of each of these.

Back-formation is the formation of a shorter, simpler word from a longer word that is perceived as morphologically complex. Probably the most famous case of back-formation is the verb *edit*, which was formed by removing the apparent suffix *-or* from *editor*. Other classic examples include:

juggle – *juggler*
sculpt – *sculptor*
diagnose – *diagnosis*

Cases of back formation can also be found among compounds:

stage-manage – *stage-manager*
chain-smoke – *chain-smoker*
air-condition – *air conditioning*
type-write – *typewriter*
televise – *television*

Blending is creating new words by combining parts of two other words:

smog = *smoke* + *fog*
brunch = *breakfast* + *lunch*
guestimate = *guess* + *estimate*
docudrama = *documentary* + *drama*
infotainment = *information* + *entertainment*
infomercial = *information* + *commercial*

Clipping is shortening of a word.

information
microphone (also: *mike*)
limousine
laboratory
aeroplane
influenza

Analogical formation is forming a new word that are clearly modelled on an already existing word.

chain-drink (modelled on *chain-smoke*)
white-list (modelled on *black-list*)
ear-witness (modelled on *eye-witness*)

abbreviations are forms made up of initial letters of words naming a concept, e.g. *UN*, *US*, *LA*, *PC*, *BA*.

acronyms are abbreviations consisting of initial letters that are read like an ordinary word, e.g. *NASA, RAM, NATO, UNESCO*.

Exercises

1. Find out the methods by which the following words were formed.

quasar

laze

radar

laser

telly

surveil

decaf

max

basic (computer language)

sonar

airsick

stage-manage

winterscape

2. Study the below list of blends and think of any derivational processes they can undergo.

smog

guestimate

brunch

ginormous

emoticon

staycation

MOST IMPORTANT DEFINITIONS

abbreviation – a form made up of initial letters of words naming a concept, e.g. *UN*

acronym – an abbreviation consisting of initial letters that are read like an ordinary word, e.g. *NATO*

actual word – a word that exists in a language and is familiar to its speakers, e.g. *driver*.

affix – a morpheme that must attach to a base and cannot occur by itself

allomorph – a variant of a morpheme, e.g. [Id] is a variant of the regular past suffix *-ed*

analogical formation – a new word modelled on an already existing word, e.g. *chain-drink*

analytic language – a language that uses little morphology (in particular inflectional morphology), e.g. English

appositional compound – a compound naming an entity that fulfils several descriptions simultaneously, e.g. *student worker*

back-formation – (formation of) a shorter, simpler word from a longer word that is perceived as morphologically complex, e.g. *edit* from *editor*

base – any form to which affixes can attach, e.g. *create*, *readable*

blend – a word whose created by combining parts of two other words, e.g. *smog*

blocking – a situation where the existence of a word prevents the application of a productive morphological pattern, e.g. the derivation of **stealer* is prevented by the word *thief*.

bound morpheme – any morpheme that must attach to another morpheme (it cannot occur on its own); affixes and bound roots are bound morphemes

bound root – a bound morpheme that is also a root, e.g. *tox-*

circumfix – an affix that overlaps the base, e.g. the German *ge-mach-t*

clipping – a shortened word that has the same meaning as the longer version, e.g. *mic*

clitic – a bound morpheme that is attached to a word but that is not an affix, e.g. *'re* in *they're*

compound – a word made of two or more words, e.g. *mailbox*.

conversion – shifting the lexical category of a word, e.g. using *table* as a verb

creativity – the creation of new words by unproductive patterns, e.g. **greenth*

derivation – the formation of complex words from simpler words by attaching affixes to the latter

endocentric compound – a compound that has a semantic head, e.g. *kitchen table*

exocentric compound – a compound that lacks a semantic head, e.g. *pickpocket*

free morpheme – a morpheme that can stand on its own; typically free roots are free morphemes

grammatical word – a word-form serving a specific grammatical function, e.g. *walked* as used as a passive participle or *walk*

homophones – words that sound the same but have different meanings, e.g. *male* and *mail*

homonym – words that sound and are spelt the same but have different meanings, e.g. *bat*

infix – an affix that occurs inside the base

inflection – formation of complex word-forms by affixation

institutionalization – incorporation of a new word to the stock of actual words

interfix – a semantically empty affix that occurs between the two members of a noun-noun compound in some languages.

lexeme – a concept representing the core meaning of the word. *Walk* and *take* are two different lexemes because they stand for two different concepts. *Govern* and *government* are also two different lexemes because they belong to different word classes, and thus name different (although related) concepts

lexicalization – the process by which a complex word becomes increasingly perceived as a single unit with a specific meaning

lexicon – a repository of words and patterns of word formation

morpheme – the smallest meaningful unit of a language; roots and affixes are all morphemes (but not complex words)

neologism – a recently created word

occasionalism – a newly created word that has not caught on and is restricted to occasional occurrences

orthographic word – a word in the written language separated by spaces from other words

paradigm – the word-forms of a lexeme, e.g. *walk*, *walks*, *walking* and *walked* form a paradigm of a lexeme *walk*

phonological word – a word a word in the spoken language which can be potentially preceded and followed by a pause.

phrasal compound – a nominal compound whose modifier is a phrase or a sentence, e.g. a *do-or-die mission*

polysemy – a situation where a word has a number of related meanings, e.g. the word *bridge* is polysemous.

possible word (potential word) – a word that does not exist but can be formed by a productive pattern

prefix – an affix that is attached before (to the left of) the base, e.g. *re-*

productivity – the ability of a morphological pattern to create new words

root – a base that consists of one morpheme, e.g. *hand*

stem – the base of an inflected word-form, e.g. *organization* in *organizations*

suffix – an affix that is attached after (to the right of) the base, e.g. *-ness*

syncretism – situation where a single word-form can perform two grammatical functions

synthetic compound – a compound whose head is deverbal (i.e. derived from a verb), e.g. *truck driver*

synthetic language – a language that uses a lot of (particularly inflectional) morphology

word-form – a concrete form of a lexeme, as used in a sentence

FUNCTION WORDS

Morphological operations apply usually to nouns, verbs, adjectives and adverbs, all of which are content words. Languages also make use of function words, which indicate grammatical functions or logical relationships between content words. Listed below are the classes of function words in English.

articles: *a/an, the*

demonstratives: *this, that, these* and *those*

pronouns: e.g. *I, you, we, they, my, your, his, hers, who* etc.

prepositions: e.g. *in, into, onto, at, on* etc.

conjunctions: e.g. *and, or, but, because, if* etc.

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