

**43. Maltese**

Maltese is an Afro-Asiatic language of the Semitic family, spoken on the island of Malta in the Mediterranean. Consider how the indefinite (*a, some*) and the definite (*the*) are formed in the following words. Maltese forms the definite of a noun by attaching either /l/ or /l/ to it. Examine the data below and answer the questions that follow. (The symbol [h] represents a voiceless pharyngeal fricative.)

**a. Indefinite**

[fellus]	'chicken'	[ilfellus]	'the chicken'
[aria]	'air'	[ilaria]	'the air'
[mara]	'woman'	[ilmara]	'the woman'
[omm]	'mother'	[lomm]	'the mother'
[kelb]	'dog'	[ilkelb]	'the dog'
[?attus]	'cat'	[il?attus]	'the cat'
[?hitan]	'walls'	[ilhitan]	'the walls'
[abt]	'armpit'	[labt]	'the armpit'
[ispaniol]	'Spanish (language)'	[lspaniol]	'the Spanish (language)'

- i. How can you predict the form of the definite marker?
- ii. What natural classes of sounds are involved?

Now look at these nouns in the indefinite and the definite:

**b. Indefinite**

[ti:n]	'a fig'	[itti:n]	'the fig'
[dawl]	'a light'	[iddawl]	'the light'
[shab]	'some clouds'	[isshab]	'the clouds'
[natura]	'nature'	[innatura]	'the nature'

The definite marker has the same phonemic form in these words as it had in part (a), but a phonological process has changed its phonetic form.

- iii. What type of process is responsible for the change? How did it affect the definite marker?
- iv. What natural class of sounds causes the change from the phonemic form to the various phonetic forms in part (b)?
- v. Give the definite form of the following nouns:

**Indefinite**

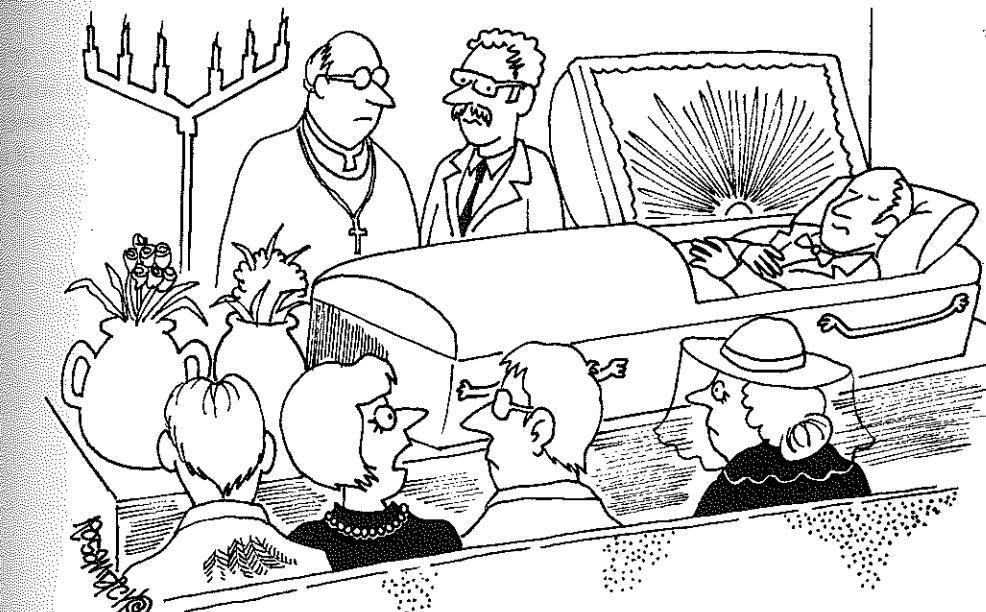
[dar:]	'a house'
[zift]	'a pitch'
[azzar]	'a piece of steel'
[ingliz]	'English'
[belt]	'a city'

**Definite**

_____	'the house'
_____	'the pitch'
_____	'the steel'
_____	'the English (lang.)'
_____	'the city'

**Further Readings**

- Hayes, Bruce. (2009). *Introductory phonology*. Oxford, UK: Wiley-Blackwell.  
 Ladefoged, P. (2005). *A course in phonetics*. (5th ed.). Florence, KY: Wadsworth Publishing.  
 Odden, David. (2005). *Introducing phonology*. Cambridge, UK: Cambridge University Press.  
 Spencer, Andrew. (1996). *Phonology*. Oxford, UK: Wiley-Blackwell.

**CHAPTER****4****Morphology**

"Isn't it ironic that the first three letters in 'funeral' spell fun?"

Cartoon by Dan Rosandich, available at [www.CartoonStock.com](http://www.CartoonStock.com)

## FILE 4.0

### What Is Morphology?

**M**orphology is the component of mental grammar that deals with types of words and how words are formed out of smaller meaningful pieces and other words. Every speaker of English knows that *wind* is an English word, as are *unwind*, *rewind*, *winding*, *windable*, *windy*, etc. However, even though *woman* is also an English word, none of the following are possible: *unwoman*, *rewoman*, *womaning*, *womanable*, *womany*, etc. Why is it that you can add *re-* to *wind* and get another word, but adding *re-* to *woman* does not result in a word?

Morphology as a subfield of linguistics studies the internal structure of words. It tries to describe which meaningful pieces of language can be combined to form words and what the consequences of such combinations are on the meaning or the grammatical function of the resulting word. For example, the addition of *re-* to *wind* modifies the meaning of *wind* in a certain way, and in fact, it does so in the same way when added to *unite* (*reunite*), or *play* (*replay*).

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- 4.1 Words and Word Formation: The Nature of the Lexicon  
*Introduces the idea that words can have their own internal structure and discusses the representation of different morphemes and morphological processes in the mind.*
- 4.2 Morphological Processes  
*Introduces various processes by which inflection and derivation may be accomplished.*
- 4.3 Morphological Types of Languages  
*Show various ways in which the world's languages make use of morphological processes.*
- 4.4 The Hierarchical Structure of Derived Words  
*Focuses on the process of affixation, exploring in more detail the way that multi-morphemic words are put together.*
- 4.5 Morphological Analysis  
*Provides a way to identify and discern information about the morphological structure of novel languages.*
- 4.6 Practice  
*Provides exercises, discussion questions, activities, and further readings related to morphology.*

## FILE 4.1

### Words and Word Formation: The Nature of the Lexicon

#### 4.1.1 What Are Words Like?

Every language has some (large) number of words available for its users to choose from as they need. This stock of words can be thought of as a sort of mental dictionary that language users—both speakers and hearers—have internalized as part and parcel of acquiring their particular language. We call this mental dictionary the **lexicon**. But what exactly are the sorts of things we might have in our lexicon?

In the study of morphology, one topic we will consider is how words are made, but first we must answer the question of what words are. Most everyone has an idea of what a word is. However, not all words are equally distinct from all other words. To begin, consider the following question:

- Are *cat* and *dog* the same word or different words?

Your answer, like that of almost anyone familiar with English, is very probably “Of course they are different words! Isn’t it obvious?” The reasons that this is obvious include both differences in **form**, that is, what a word sounds like when spoken (/kæt/ is quite distinct from /dæg/; refer to the last page of the book for help with any unfamiliar symbols) and differences in **meaning**, such as the fact that you cannot simply use *cat* and *dog* interchangeably to mean the same thing. On the other hand, you might say *cat* and *dog* are both kinds of pets, so the words aren’t 100% different; they do have something to do with each other. These sorts of similarities, however, are not enough to lead us to claim that *cat* and *dog* are the same word.

Now consider this question:

- Are *cat* and *catalog* the same word or different words?

Based on the discussion above, some readers might hesitate before answering this question. These two words share some elements of form, the /kæt/ part, but *catalog* doesn’t seem to have the meaning of *cat* anywhere in it. Similarly, the words *kid* and *kidney* may sound partly the same, but it seems that they are not actually related in their meaning. Even though it sounds like there **could** be a *cat* and a *log* in *catalog*, or a *kid* in *kidney*, and such a connection might even be used as a source of humor in a joke or cartoon, English speakers consistently distinguish these pairs as each containing two unrelated words. Thus, when looking to see whether two items are the same word, we must consider both their phonological form and their meaning. Nevertheless, the thought that one word could be found “inside” another word is an important one.

### 4.1.2 Derivation

In order to get at the idea of words being inside one another, consider this third question:

- Are *cat* and *catty* ("spiteful") the same word or different words?

Here, the connection is a good bit closer than in the preceding word comparisons. Cats have gained a reputation for sometimes being vicious fighters, and it is most probably in this context that the word *catty* came into existence as part of the English language, meaning something like 'behaving like a cat in a certain respect.' So the words *cat* and *catty* are similar not only in terms of their form (the /kaet/ part) but also in terms of their meaning, since both (at least potentially) engender the image of nasty fighting. Is this enough to say that *cat* and *catty* are instances of the same word?

Apart from having a certain phonological form and a meaning, words also belong to **lexical categories**, which are also sometimes called parts of speech. Lexical categories are classes of words that differ in how other words can be constructed out of them. For example, if a word belongs to the lexical category **verb**, it is possible to add *-ing* or *-able* to it to get another word (e.g. *wind* and *drink* are verbs). If a word belongs to the lexical category **adjective**, you can add *-ness* or *-est* to it to get another word (e.g. *quick* and *happy* are adjectives). If a word belongs to the category **noun**, you can usually add *-s* to it to make it plural (e.g. *desk* and *dog* are nouns). You can add *-like* to nouns to form an adjective (e.g. *woman-like*, *city-like*, etc.). You can also add *-ly* to many adjectives and form an **adverb** (e.g. *quickly*, *happily*, and *readily*).

Nouns, verbs, adjectives, and adverbs are also called **open lexical categories** because new words added to the language usually belong to these categories. In contrast, **closed lexical categories** rarely acquire new members. Closed lexical categories include **pronouns** (e.g. *we*, *she*, *they*), **determiners** (e.g. *a*, *the*, *this*, *your*), **prepositions** (e.g. *on*, *of*, *under*, *for*), and **conjunctions** (e.g. *and*, *or*, *but*).<sup>1</sup>

Now we can consider whether *cat* and *catty* belong to the same lexical category. The answer is no—*cat* is a noun, while *catty* is an adjective. Even though *cat* and *catty* share elements of form and elements of meaning, the fact that the words belong to different parts of speech classes is a pretty clear sign that we are in fact dealing with two different words, rather than two "versions" of one word. There remains the feeling, however, that *cat* and *catty* are related in a way that *cat* and *dog*, on the one hand, and *cat* and *catalog*, on the other, are not. What is the nature of this relation? Let's compare some of the attributes of the two words:

(1)	CAT	CATTY
Form:	/kaet/	/kæti/
Meaning:	'domesticated feline'	'spiteful, (fighting) like a domesticated feline'
Lexical Category:	noun	adjective

With respect to form, *cat* is obviously a shorter word (i.e., contains fewer sounds) than *catty*. The meaning of *catty* also seems to be based on the meaning of *cat*, rather than the

<sup>1</sup>See File 5.4 for a discussion of syntactic categories. Lexical and syntactic categories may, but do not necessarily, coincide—for example, verb is a lexical but not a syntactic category. Lexical categories are distinguished based on how you can construct other words out of the words that belong to that category—their morphological properties. Syntactic categories are distinguished by how you can construct sentences and other phrases out of expressions that belong to that category—their syntactic properties. This is why they are not necessarily the same thing. Also note that words and larger multi-word expressions belong to a syntactic category, but only words belong to lexical categories. For example, *likes* belongs to a lexical and a syntactic category, but *likes Bob a lot* has only a syntactic category associated with it.

other way around. This suggests that *catty* is based on *cat* or, in other words, that *cat* is the **root** on which *catty* is built. This process of creating words out of other words is called **derivation**. Derivation takes one word and performs one or more "operations" on it, the result being some other word, typically of a different lexical category. In the simplest case, the root is used "as-is," and one or more additional pieces are tacked onto it. The added pieces are called **affixes**. The thing to which the affixes attach is called the **stem**. In the case of *catty*, *cat* /kaet/ is both the root and the stem, and the affix is /i/, spelled <y>, which is attached to the right edge of the stem.<sup>2</sup> Affixes such as /i/ are called derivational affixes since they participate in derivational processes.

### 4.1.3 Inflection

At this point, there is one more question for you to consider:

- Are *cat* and *cats* the same word or different words?

In terms of phonological form, the difference between /kaet/ and /kæts/ is exactly the same in degree (that is, one additional sound) as the difference we saw between /kaet/ and /kæti/. With respect to meaning, however, *cat* and *cats* seem to refer to just the same kind of thing, the difference being whether we want to talk about one (singular) or more than one (plural) of that thing. Moreover, these are both of the same lexical category, noun:

(2)	CAT	CATS
Form:	/kaet/	/kæts/
Meaning:	'domesticated feline'	'domesticated feline' (plural)
Lexical Category:	noun	noun

This time the answer to the "same or different" question is not as obvious as it was in the earlier cases. *Cats* represents a different grammatical form of the word *cat*, used just in case we need to talk about more than one member of the class of *cat*. The creation of different grammatical forms of words is called **inflection**. Inflection uses the same sorts of pieces, such as stems and affixes, that derivation does, but the important difference is the linguistic entity that inflection creates—forms of words, rather than entirely new words. Typically, in contrast to derivational affixes, inflectional affixes such as *-s* do not change the lexical category of the word—both *cat* and *cats* are nouns. Similarly, both *wind* and *winding* are considered verbs. In sum, we find that the idea of "same" or "different" with respect to words can be unexpectedly complicated since words have a number of different properties that need to be considered; at the very least, these include phonological form, meaning, and lexical category.

There are actually very few inflectional affixes in English, so it may help to collect them in one table for easy reference (see (3)). (Table (3) shows all of the functions of inflectional affixes of English and most of the common forms that those affixes take. However, there are some less common affixes that do not appear in the table. For example, the plural of *ox* is formed with the suffix *-en*, but because the plural marker *-en* appears on very few words, it is not listed below.) Notice that all of the inflectional affixes in the table—and all

<sup>2</sup>If you are wondering about the second "t" in *catty*, something not present in *cat*, it is important to notice that the 't' is purely a spelling convention and is not reflected directly in the pronunciation, that is, the /t/ in *catty* is not "twice as long" as the /t/ in *cat*. Although in many cases it does not cause any problems to refer to the spelling when talking about the structure of words, there are cases where the spelling can be misleading about what is actually going on with morphological processes. By and large we will disregard spelling; see File 1.3.

of the inflectional affixes of English—are attached after the stem. (Derivational affixes in English may attach either before or after the stem.) This generalization does not hold for all languages, however.

### (3) Inflectional affixes of English

Function	Affix(es)	Attaches to	Example
3rd per. sing. present	-s	verbs	She waits there at noon.
past tense	-ed	verbs	She waited there yesterday.
progressive aspect	-ing	verbs	She is waiting there now.
past participle	-en, -ed	verbs	Jack has eaten the cookies. Jack has tasted the cookies.
plural	-s	nouns	The chairs are in the room.
possessive	's, -s'	nouns	The chair's leg is broken. The chairs' legs are broken.
comparative	-er	adjectives, adverbs	Jill is taller than Joe. Joe runs faster than Jill.
superlative	-est	adjectives, adverbs	Ted is the tallest in his class. Michael runs fastest of all.

### 4.1.4 Some Notes about Morphemes

So far we have seen words that cannot be broken down into smaller parts, like *cat* and *catalog*, and words that contain two parts—a root and an affix—like *catty* and *cats*. Roots and affixes are called **morphemes**. A morpheme is typically defined as the smallest linguistic unit with a meaning (e.g. the morpheme *cat*) or a grammatical function (e.g. the morpheme *-ed* that indicates past tense). Of course, a morpheme also has a certain phonological form. Thus, there are no smaller forms that carry their own meaning or grammatical function than morphemes.

A few notes are in order about the terminology that we use to discuss morphemes. First, while a root by definition contains only one morpheme, a stem may contain more than one morpheme. For example, in *cattiness*, the root is *cat*, but the stem to which the derivational affix *-ness* is added is *catty*, which itself contains two morphemes, as we have already observed. Each affix is also a single morpheme. Affixes that follow a stem are called **suffixes**, whereas affixes that precede a stem are called **prefixes**.

Another thing to notice about affixes is that sometimes different meanings or functions can be marked by the same phonetic shape (note the two -s affixes in table (3)). Affixes that sound alike but have different meanings or functions are **homophonous** (see Section 5.5.3). (Different words that sound the same are likewise said to be homophonous.) Another example is the case of *-er*, which can be either inflectional or derivational. As an inflectional suffix, it marks comparative degree on adjectives and adverbs (like in *taller*, *faster* in the table), but the same phonetic shape can be used to derive an agent noun from a verb, as in *speak*, *speaker*. These two *-er* affixes are homophonous with each other, and it is therefore important to consider not only form but also meaning when you are analyzing morphological structures.

Further evidence that both form and meaning are necessary when identifying morphemes comes from cases of words that merely appear to contain multiple morphemes, but in fact do not. Look again at the word *catalog*. In terms of both its orthography and its

### File 4.1 The Nature of the Lexicon

pronunciation, it appears to contain the words *cat*, *a*, and *log*. Neither felines nor sections of tree limbs have anything to do with ‘inventories,’ though. Thus, we conclude that *catalog* is monomorphemic: it is made of only one part.

As a final caution, do not confuse word length with number of morphemes. Some words, such as *Madagascar*, *lugubrious*, or *pumpernickel*, are quite long but contain only one morpheme; other words, such as *ads*, are very short but contain two morphemes.

### 4.1.5 Classifying Elements in Morphology

In morphology, the most basic act of analysis is a comparison of words based on form, meaning, and lexical category. Such comparisons allow for the segmentation of words into the smaller parts that they contain, i.e. morphemes. From such an analysis, it becomes apparent that words and affixes do not share the same status in the language overall. Simple words like *cat*, *dog*, *book*, and *walk* cannot be broken down into smaller meaningful pieces—they consist of exactly one morpheme. Affixes like *-ing* or *-y* also consist of only one morpheme but cannot stand alone like single-morpheme words.

Morphemes such as the simple words above are called **free morphemes** because they can be used as words all by themselves. Affixes, on the other hand, always have to be attached to the stem of some word in order to be used. Because they cannot stand alone, affixes are called **bound morphemes**. Affixes are not the only things that can be bound. There are some roots that do not have stand-alone forms; that is, they only appear with one or more affixes attached. For example, the words *infer*, *confer*, *refer*, *defer*, *prefer*, and *transfer* all seem to have a root *-fer* (stem /fə/) with a prefix attached to its left. This root, however, does not correspond to any free morpheme in English. The same is true of *boysen-* and *rasp-* in *boysenberry* and *raspberry*. While *berry* is a free morpheme, neither *boysen-* nor *rasp-* can stand alone. Morphemes of this sort are called **bound roots** because although they do seem to have some associated basic meaning (in the case of *-fer*, the meaning is something like ‘carry, bring’), they are unable to stand alone as words in their own right. Other examples are *-ceive* (*conceive*, *receive*, *deceive*) and *-sist* (*resist*, *desist*, *consist*, *subsist*). Can you think of a single basic meaning for each of these bound roots?

Traditionally, a distinction is also made between **content** and **function morphemes**. Content morphemes are said to have more concrete meaning than function morphemes. Function morphemes, on the other hand, contain primarily grammatically relevant information. Sometimes, it is said that content morphemes carry semantic content (roughly, they refer to something out in the world), while function morphemes do not. A free root like *cat* is a prototypical content morpheme with a fairly concrete meaning. It carries semantic content in the sense that it refers to certain feline individuals out in the world. The affix *-ing*, on the other hand, is a prototypical function morpheme; it marks aspect<sup>3</sup> on a verb but doesn't have semantic content in the way that *cat* does.

Content morphemes include all derivational affixes, bound roots, and free roots that belong to the lexical categories of noun, verb, adjective, and adverb. Free content morphemes, that is, nouns, verbs, adjectives, and adverbs, are also called **content words**.

Function morphemes include all inflectional affixes and free roots that belong to lexical categories preposition, determiner, pronoun, or conjunction. Free function morphemes, that is, prepositions, determiners, pronouns, and conjunctions, are also called **function words**.

<sup>3</sup>Aspect refers to how some event unfolds in time, for example, whether it is completed, ongoing, frequently occurring, etc., but it does not specify the actual time at which this event unfolds. For example, *was eating* and *will be eating* have different tense marking (past vs. future), but the same aspect (progressive, meaning that the eating event is depicted as ongoing or in progress); *was eating* and *has eaten* have different aspect, the former indicating that the action was in progress, the other that the action was completed.

## (4) Possible kinds of morphemes

	<b>Content Morphemes</b>	<b>Function Morphemes</b>
<b>Free Morphemes</b>	<ul style="list-style-type: none"> <li>Content words:           <ul style="list-style-type: none"> <li>Nouns</li> <li>Verbs</li> <li>Adjectives</li> <li>Adverbs</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Function words:           <ul style="list-style-type: none"> <li>Determiners</li> <li>Prepositions</li> <li>Pronouns</li> <li>Conjunctions</li> </ul> </li> <li>Inflectional Affixes</li> </ul>
<b>Bound Morphemes</b>	<ul style="list-style-type: none"> <li>Bound roots</li> <li>Derivational affixes</li> </ul>	

While it may be useful to maintain the distinction between content and function morphemes, we must warn you that the distinction is not always clearcut, and the classification of morphemes into these two classes may seem counterintuitive at times. For example, the preposition *under* is classified as a function morpheme, yet it seems to have a pretty concrete meaning—so concrete, in fact, that it would be easy to draw a picture to represent its meaning. On the other hand, the derivational affix *-ness* is classified as a content morpheme, but it is difficult to spell out what its meaning is. Its function seems to be to turn adjectives into nouns. While this is grammatically relevant, it would be difficult to draw a picture to capture the meaning of *-ness*. It can also be difficult to appreciate the meaning contribution of bound roots, which are classified as content morphemes. If anything, *under* may seem to be more meaningful than *-ness*, but their classification does not necessarily support that intuition. If you are having trouble determining whether a morpheme is classified as a content or a function morpheme, refer to the table in (4) for help.

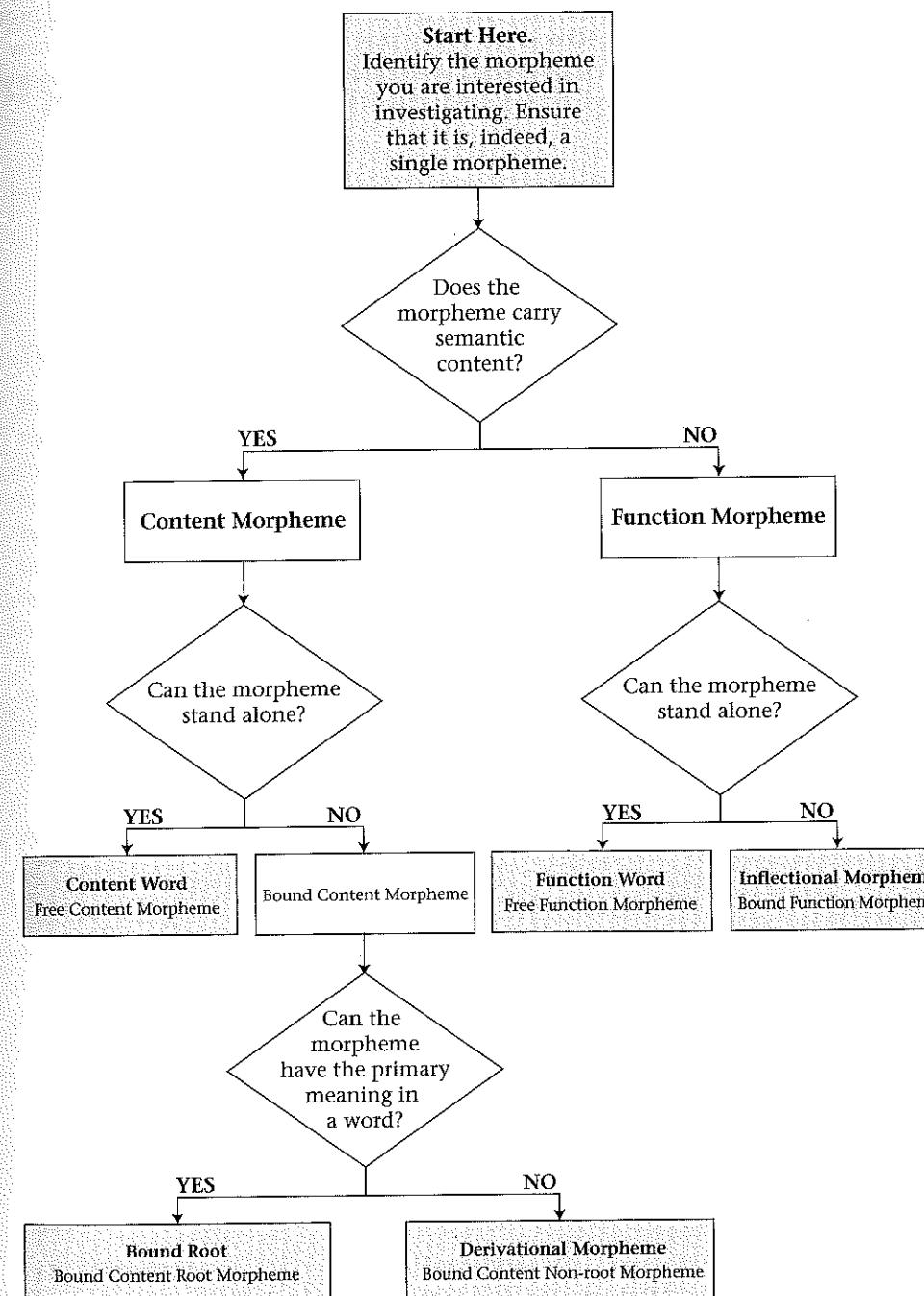
Given any particular morpheme, the diagram in (5) may help you decide what sort of morpheme it is.

#### 4.1.6 Derived and Inflected Words in the Lexicon

We have said that both derivation and inflection are ways of forming words, but in what sense is it meant that new words are being “formed”? Do we mean that every time a speaker uses a morphologically complex word, the brain reconstructs it? Some linguists maintain that this is the case. They claim that in a speaker’s mental dictionary, the lexicon, each morpheme is listed individually along with other information such as its meaning, its lexical category (if it is a free morpheme), and rules for how and when it is allowed to attach to stems (if it is a bound morpheme). Indeed, that does seem to be what happens for some morphological processes in some languages. Thus, each time a word is used, it is re-formed from the separate entries in the lexicon of the parts that make it up. There is evidence, however, that indicates this is not the case for all languages; even morphologically complex words can apparently have a separate entry in the adult lexicon. That is, as English speakers, when we hear a morphologically complex word, such as *nonrecyclable*, we do not have to pull together the meanings of *non-*, *re-*, *cycle*, and *-able*. Rather, we by and large access the whole word together. (Refer to File 9.5 for more information about how words are stored in the lexicon.)

Even if not all language users do “build” morphologically complex words and word-forms every time they use them, there are still other reasons to consider derivation a process of word formation. In describing a language, the term *formation* refers to the systematic relationships between roots and the words derived from them on the one hand, and, on the other hand, between a word and its various inflected (i.e., grammatical) forms.

## (5) A flowchart for identifying the status of morphemes



Furthermore, speakers of a given language also are often aware of these relationships. We see evidence of this when new words are formed based on patterns that exist in the lexicon. For example, a speaker of English may never have heard words such as *unsmelly*, *smellability*, or *smellful* before, but he or she would certainly understand what they mean. The fact that English speakers may use a word like *stick-to-it-ive-ness* illustrates that speakers of a language have no problem accessing the patterns in their lexicons and applying them for interpreting unfamiliar words . . . and even for creating them!

Rules that speakers are able to apply to form novel words are termed **productive rules**. (Refer to File 1.4.) English has examples of both nonproductive morphemes and productive ones; for example, the suffix *-tion* is generally not used by speakers to form new nouns, whereas the suffix *-ness* is. Over long periods of time, different affixes or other morphological processes may become more or less productive (see File 13.4).

## FILE 4.2

# Morphological Processes

### 4.2.1 The Processes of Forming Words

In the previous file, we looked at how words are put together and marked for grammatical features such as number and tense. We have seen that English makes use of derivational affixes to create more words than would exist with free morphemes alone. Of course, English is not the only language that enlarges its vocabulary in this way. When linguists observe a language that uses affixation to form additional words, they note that the occurring combinations are systematic, i.e., rule-governed. Because these combinations are rule-governed, we can say that a process is at work—namely, a **word formation process**—since new words or forms of words are being formed. What we will consider in this file are the ways in which languages create new words from existing words, and the grammatical forms of words. We shall see that many languages employ affixation but that many other languages employ other processes. (See Files 12.1 and 13.4 for still more ways in which new words come into use in a language.)

### 4.2.2 Affixation

To this point, our morphological discussion has been limited to the process of **affixation**. Although English uses only **prefixes** (affixes that precede the stem they attach to) and **suffixes** (affixes that follow the stem they attach to), many other languages use **infixes** as well. Infixes are inserted within the root morpheme. Note that English has no regular infixes. At first glance, some students think that *-ful* in a word like *doubtfully* is an infix because it occurs in the middle of a word; File 4.4 will provide a more thorough account of how affixation works and show why this must be an incorrect analysis. In some colloquial speech or slang, there is some evidence of English infixes, but although some of these forms may be moderately productive, they are far from routinized. Tagalog, on the other hand, one of the major languages of the Philippines, uses infixes quite extensively. For example, the infix *-um-* is used to form the infinitive form of verbs:

(1)	<i>Verb Stem</i>	<i>Infinitive</i>
	sulat 'write'	sumulat 'to write'
	bili 'buy'	bumili 'to buy'
	kuha 'take, get'	kumuha 'to take, to get'

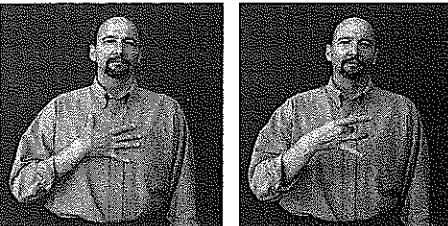
### 4.2.3 Affixation in Signed Languages

Signed languages make use of affixation as well: in the same way that a certain phonological form may either precede or follow a stem in spoken languages, so may a particular gesture precede or follow another gesture in a signed language. As an example, consider a suffix used in American Sign Language used to indicate negation. Recall from Section 2.7.1 that

phonetic parameters of sign language gestures include place of articulation, handshape, movement, hand orientation, and non-manual markers. This particular suffix is a movement: a rapid turning over of the hand, affixed to the end of the root sign that it is negating. The result of turning the hand is that the hand orientation in the suffix is reversed from the hand orientation in the root word. Therefore, the suffix is called the REVERSAL-OF-ORIENTATION suffix. Examples follow. Notice that in each case the two signs begin in the same way, but in the negated form, there is an additional step of turning the hand away from its original orientation.

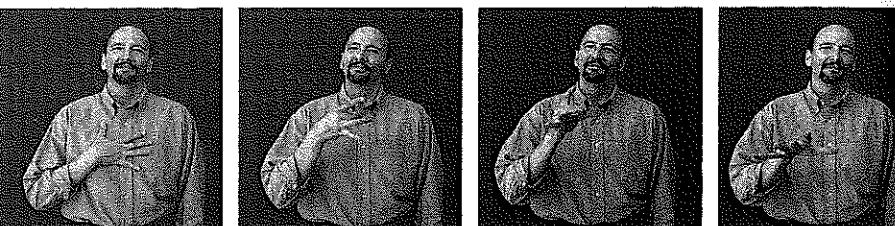
#### *Examples of the REVERSAL-OF-ORIENTATION suffix in ASL*

(2) a. LIKE



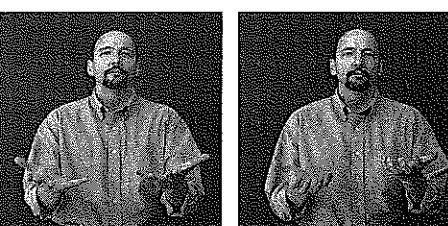
© 2006, William Vicars, www.Lifeprint.com. Adapted by permission.

b. DON'T-LIKE



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(3) a. WANT



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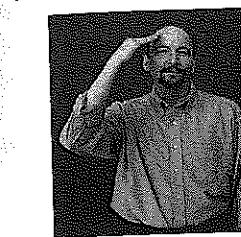
b. DON'T-WANT



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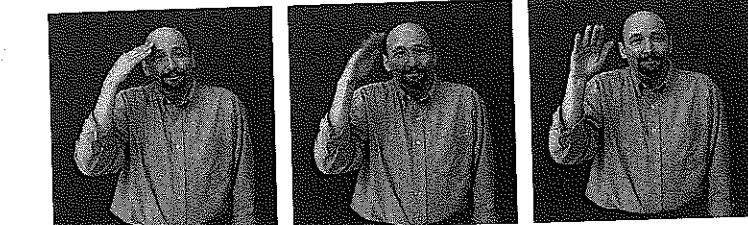
#### File 4.2 Morphological Processes

(4) a. KNOW



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b. DON'T-KNOW



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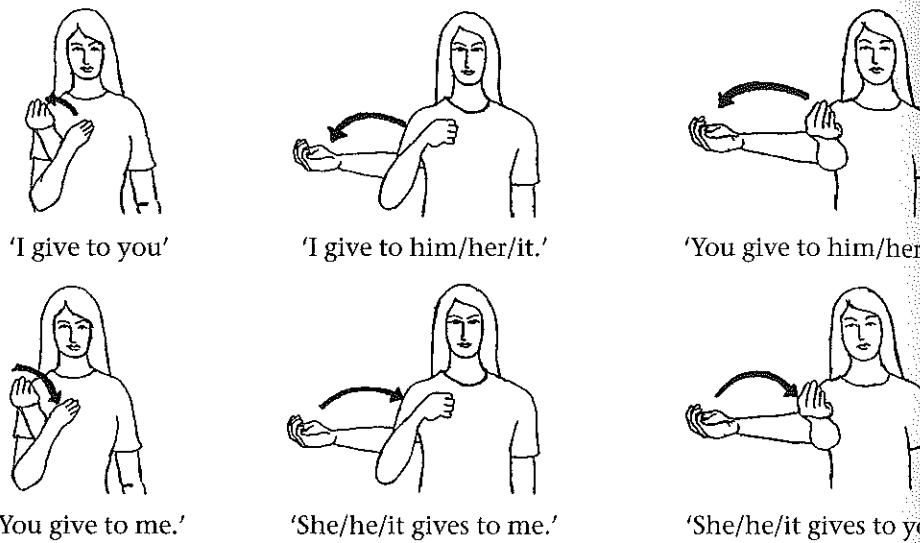
By looking at (2)–(4), you will see that the exact form of the negation suffix differs in different environments. That is, although the movement is the same in each case (a turning of the hand(s) away from where it was originally facing), the location and orientation of the suffix are borrowed from the stem. Therefore, DON'T-LIKE and DON'T-WANT are articulated in front of the torso where LIKE and WANT are articulated, but DON'T-KNOW is articulated on the side of the head, where KNOW is articulated. This is no different from spoken languages, in which the form of an affix may assimilate to some aspect of the form of the stem. For example, in English we find the *in-* suffix which changes its form in such words as *irresponsible*, *impossible*, and *illogical*. Although the REVERSAL-OF-ORIENTATION suffix assimilates to a root word, the affix is clearly a second gesture which follows the root sign. Thus, so far, we have seen only cases where affixation in signed languages works very similarly to the way that it does in spoken languages.

Additionally, signed languages allow a kind of affixation that is not possible in spoken languages. For spoken languages, we considered affixes that can appear at the beginning, in the middle, and at the end of a stem. What we have not considered are affixes that are articulated at the same time as the stem. The reason is that in spoken language it is not possible to articulate two morphemes at the same time! In many cases, however, it is possible to articulate two morphemes in a visual-gestural language at the same time. (Recall from File 2.7 that phonemes in signs also routinely co-occur.) When affixes appear at the same time as each other, we say that they are **simultaneous**. Examples of simultaneous morphology have been found in every signed language that has been studied. This concept seems rather foreign to individuals who have studied only spoken languages, but it is not terribly complicated. Although signed languages allow affixation to be manifested in a way that spoken languages do not, by and large the rules for affixation are exactly the same for simultaneous morphology as for the linear morphology we have considered so far.

Most simultaneous morphology—from every signed language that has been studied—is inflectional rather than derivational. A form of simultaneous affixation that is very common across signed languages is verb inflection: morphological marking of subject and object on the verb. The general idea is that the sign for the verb originates in one location in order to mark the identity of the individual performing the action (the subject) and terminates in another location to indicate the object, while other aspects of the sign remain

the same. This type of verbal inflection is used extensively in some signed languages (e.g., Idioma de Signos Nicaragense, a signed language of Nicaragua) and hardly at all in others (e.g., Kata Kolok, a signed language of Bali). In (5) is an example from American Sign Language. Although direction of movement differs depending on subject and object, hand shape and the general type of movement (an arching path from one location to another) are consistent regardless of particular inflection.

(5) GIVE (inflected for various subjects and objects)



A number of other verbs in ASL show similar patterns, including MEET, which can be found in (7) in File 2.7. Others include SHOW, ASK, and SEE. Note that while many signed languages have very similar verbal inflection systems, they are not entirely the same. Furthermore, different languages have different sets of verbs that inflect in this way: the Taiwan SL sign for 'teach' does inflect in this way, while the ASL sign for 'teach' does not.

A second example of simultaneous inflectional morphology in ASL is adverbial inflection of adjectives. For example, the sign HOT can be modified to mean VERY HOT by holding the first location of the sign for a small amount longer and then releasing it very quickly, as shown in (6). (Notice that the signer is moving his hand so quickly in the third cell of VERY HOT that the image of his hand is completely blurred!)

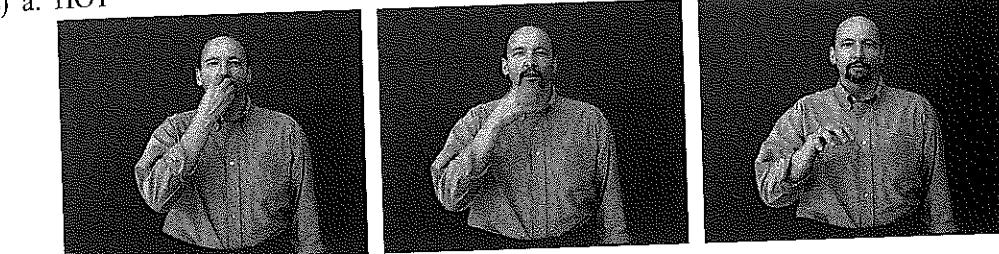
To articulate the VERY morpheme, hand shape, orientation, location, and path of movement remain the same, but the way that the movement is performed is different.<sup>1</sup> This "rapid release" morpheme can apply to many ASL adjectives.

#### 4.2.4 Compounding

**Compounding** is a process that forms new words not by means of affixes but from two or more independent words. The words that are the parts of the compound can be free morphemes, words derived by affixation, or even words formed by compounding themselves. Examples in English of these three types are shown in (7).

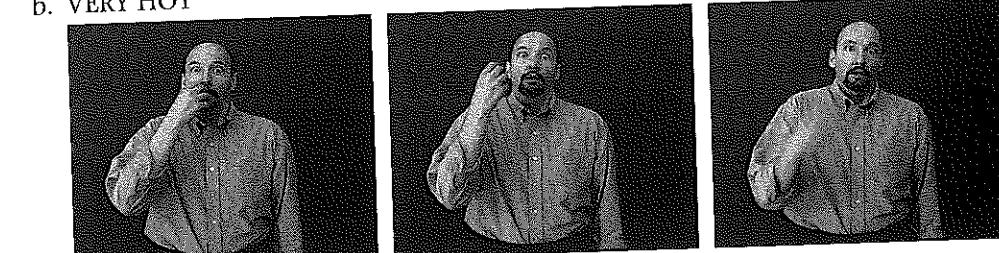
<sup>1</sup>The signer also can use non-manual markers for emphasis; this is equivalent to a speaker using features of his voice such as pitch or volume to alter the interpretation of a word. Imagine an English speaker saying, "I accidentally touched the pot right after it came from the oven, and it was HOT!"

(6) a. HOT



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b. VERY HOT



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(7) Examples of English compounds

Compounding of Free Morphemes	Compounding of Affixed Words	Compounding of Compounded Words
girlfriend	air-conditioner	lifeguard chair
blackbird	looking-glass	aircraft carrier
textbook	watch-maker	life-insurance salesman

Notice that in English, compound words are not represented consistently in writing. Sometimes they are written together, sometimes they are written with a hyphen, and sometimes they are written separately. We know, however, that compounding forms words and not syntactic phrases, regardless of how the compound is written, because the stress patterns are different for compounds. Think about how you would say the words *red neck* in each of the two following sentences:

- (8) a. The wool sweater gave the man a red neck.  
b. If you want to make Tim really angry, call him a redneck.

Compounds that have words in the same order as phrases have primary stress on the first word only, while individual words in phrases have independent primary stress. Some other examples are listed in (9). (Primary stress is indicated by ' on the vowel.)

(9) Compounds	Phrases
bláckbird	bláck bírd
máke úp	máke úp

German is one of the many other languages that use compounding to form new words. Some examples of the numerous compounds in German are listed in (10).

(10)	<b>Compound</b>	<b>Meaning</b>	<b>Meanings of Individual Morphemes</b>
	Muttersprache	'native language'	< mother language
	Schreibtisch	'desk'	< write table
	stehenbleiben	'stand (still)'	< stand remain
	Wunderkind	'child prodigy'	< miracle child
	Parkzeitüberschreitung	'exceeding of the amount of time one is allowed to park'	< park time exceedance

#### 4.2.5 Reduplication

**Reduplication** is a process of forming new words by doubling either an entire free morpheme (**total reduplication**) or part of it (**partial reduplication**). English makes no systematic use of reduplication as a part of the language's grammar. There are a very few nonsystematic cases of lexical reduplication, however, such as "bye bye." Furthermore, in colloquial speech, we may often see reduplication used to indicate intensity; this can happen with verbs, adjectives, and nouns. Consider examples (11)–(13): what does the reduplicated word mean in each case?

- (11) Do you just like him as a friend, or do you like-like him?
- (12) That shirt isn't what I had in mind; it's much too pale of a green. I want a shirt that is green-green.
- (13) Yesterday we just went out for coffee, but this weekend we're going on a date-date.

As you can see, though, each of these uses is very restricted to the context in which it appears. We wouldn't want to say that *green-green* is a word of English. On the other hand, there are some languages that make extensive use of reduplication. In these languages, reduplication can serve some of the same functions that affixation serves in English.

Indonesian uses total reduplication to form the plurals of nouns:

(14)	<b>Singular</b>	<b>Plural</b>
	rumah	'house'
	ibu	'mother'
	lalat	'fly'

rumahrumah	'houses'
ibuibu	'mothers'
lalatlalat	'flies'

ASL also uses reduplication for some (though not all) of its plural formation and for other derivational and inflectional purposes.

Tagalog, on the other hand, uses partial reduplication to indicate the future tense of verbs:

(15)	<b>Verb Stem</b>	<b>Future Tense</b>
	bili	'buy'
	kain	'eat'
	pasok	'enter'

bibili	'will buy'
kakain	'will eat'
papasok	'will enter'

Notice that the reduplicated piece, the **reduplicant**, can be described phonologically as the first syllable of the stem.

In conjunction with the prefix *mag-* (which often changes the initial consonant of a following morpheme to a nasal with the same place of articulation as the original initial consonant), Tagalog also uses reduplication to derive words for occupations:<sup>2</sup>

<sup>2</sup>Since the phonological content of the reduplicated piece (the reduplicant) depends on the phonological shape of the stem it attaches to, the "morpheme" in reduplication is the presence of the reduplicant, rather than the phonological shape of the reduplicant.

(16)	<b>Occupation</b>	<b>Morphemes</b>	<b>Verb</b>
	[mamimili]	'buyer'	< /maj+bi+bili/ [bili] 'buy'
	[manunulat]	'writer'	< /maj+su+sulat/ [sulat] 'write'
	[maj?i?isda]	'fisherman'	< /maj+i?isda/ [?isda] 'fish'

#### 4.2.6 Alternations

Besides adding an affix to a morpheme or copying all or part of the morpheme to make new words or make morphological distinctions, it is also possible to make morpheme-internal modifications, called **alternations**. While alternations have to do with the sounds in a particular word pair or larger word set, these alternations mark morphological distinctions, whereas the rules in the phonology files (see File 3.3) dealt with pronunciation independent of meaning. The following are examples of morphological alternations in English:

- (17) Although the usual pattern of plural formation is to add an inflectional morpheme, some English plurals make an internal modification:

man	men	[æ]	~	[e] ([æ] alternates with [e] in these forms)
woman	women	[ʊ]	~	[ɪ]
goose	geese	[u]	~	[i]
foot	feet	[ʊ]	~	[ɪ]

- (18) The usual pattern of past and past participle formation is to add an affix, but some verbs show an internal alternation:

ring	rang	rung	[ɪ]~[æ]~[ʌ]
drink	drank	drunk	
swim	swam	swum	
feed	fed	fed	[i]~[ɛ]~[e]
hold	held	held	[oʊ]~[ɛ]~[e]

Some verbs show both an alternation and the addition of an affix to one form:

(19)	<b>Root</b>	<b>Alternation</b>	<b>Alternation and Affixation</b>
	break	broke	broken
	speak	spoke	spoken
	bite	bit	bitten
	fall	fell	fallen
	give	gave	given

Although the above examples are all inflectional, sometimes a derivational relation such as a change in part of speech class can be indicated by means of alternations. In the case of (20), the final consonant of a noun voices in order to become a verb.

(20)	<b>Nouns</b>	<b>Verbs</b>
	strife (n)	[straɪf]
	teeth (n)	[tiθ]
	breath (n)	[breθ]
	use (n)	[jus]

Alternation is also a fairly common phenomenon in languages of the world. The following data come from Hebrew and show derivational alternation between nouns and verbs:

(21) <i>Verbs</i>	<i>Nouns</i>
[limed]	'he taught'
[sijem]	'he finished'
[tijel]	'he traveled'
[bikey]	'he visited'
[dibey]	'he spoke'

#### 4.2.7 Suppletion

Languages that employ morphological processes to form words will usually have a regular productive way of doing so according to one or more of the processes discussed above. They might also have some smaller classes of words that are irregular because they mark the same morphological distinction by another of these processes. Sometimes, however, a root will have one or more inflected forms phonetically unrelated to the shape of the root. This completely irregular situation is called **suppletion**.

A small number of English verbs have suppletive past tenses:

(22) <i>Present</i>	<i>Past</i>
[iz] is	[wəz] was
[gʊ̯] go	[went] went

Interestingly, verbs derived from the irregular *go* also show similar suppletion in their past stems: *undergo*, [past] *underwent*. Two common English adjectives—*good* and *bad*—have suppletive comparative and superlative forms.

(23) <i>Adj</i>	<i>Comparative</i>	<i>Superlative</i>
[gʊ̯d] good	[bɛr̩t̩] better	[bɛst̩] best
[bæd] bad	[wɪs̩] worse	[wɪst̩] worst

Note that there is simply no systematic similarity between the stems of these various inflected forms. That is, we could not write a productive or general rule that would account for the forms we find.

Noun inflection in Classical Arabic provides another example of suppletion:

(24) <i>Singular</i>	<i>Plural</i>
[mar?at̩] 'woman'	[nisa:?] 'women'

The usual plural form for Classical Arabic nouns ending in [at̩], however, involves the lengthening of the vowel of this ending (a morphological alternation):

(25) <i>Singular</i>	<i>Plural</i>
[dira:sat̩] '(a) study'	[dira:sat̩] 'studies'
[harakat̩] 'movement'	[harakat̩] 'movements'

Any given language will likely have some example(s) of suppletion, but these typically constitute a minority class within the lexicon.

## FILE 4.3

### Morphological Types of Languages

#### 4.3.1 Classifying Languages by Morphological Type

So far, we have considered a number of processes that a language might utilize in order to form words: affixation, compounding, reduplication, alternation, and suppletion. Some languages make use of a number of these processes; others make use of very few; still others make use of none at all. Languages can be classified according to the way in which they use or don't use morphological processes. There are two basic morphological types, **analytic** and **synthetic**, the latter having several subtypes.

#### 4.3.2 Analytic Languages

Analytic languages are so called because they are made up of sequences of free morphemes—each word consists of a single morpheme, used by itself with meaning and function intact. Purely analytic languages, also called **isolating** languages, do not use affixes to compose words. Semantic and grammatical concepts which are often expressed in other languages through the use of affixes are expressed by the use of separate words in analytic languages.

Mandarin Chinese is an example of a language that has a highly analytic structure. In the example sentences below, for instance, the concept of plurality and the concept of the past tense are communicated in Mandarin through the use of invariant function words rather than the use of a change of form (cf. English, *I* to *we* to indicate plurality) or the use of an affix (cf. English *-ed* for past tense).

- (1) [wɔ̯ mən tan tçin] (tones omitted)  
*I plural play piano*  
 'We are playing the piano'

- (2) [wɔ̯ mən tan tçin lə] (tones omitted)  
*I plural play piano past*  
 'We played the piano'

Note that the form of 'we' (I-plural) that is used in the subject position is [wɔ̯ mən] and that the pronoun has the same form when it is used as the object, placed after the verb:

- (3) [ta da wɔ̯ mən] (tones omitted)  
*s/he hit(s) I plural*  
 'S/he hits us'

Only the position of a word in a sentence shows its function. English is unlike Mandarin in this respect, since the personal pronoun *we* is changed in form to *us* when it is used as the object of a verb. But English is like Mandarin in that word order is used to show the functions of nouns in a sentence, and in that nouns (unlike pronouns) are not marked by

affixes to show their functions. For example, in the sentence *Girls like cats* the noun *girls* functions as the subject, and the noun *cats* as the direct object, but just the opposite is true of *Cats like girls*; these differences in function are signaled only by the order of words in the sentence in both English and Mandarin. Nonanalytic languages may use morphology to mark these differences.

Although only affixation has been explicitly mentioned in this section, recognize that prototypical analytic languages make use of no morphological processes at all.

### 4.3.3 Synthetic Languages

In **synthetic languages**, bound morphemes are attached to other morphemes, so a word may be made up of several meaningful elements. The bound morphemes may add another element of meaning to the stem (derivation) or indicate the grammatical function of the stem in a sentence (inflection). Recall that the term *stem* refers to that part of the word to which affixes are added. It may consist of one or more morphemes: for instance, in *reruns*, -s is added to the stem *rerun*, which is itself made up of two morphemes: *re-* and the root *run*.

Hungarian is a synthetic language. In the examples below, bound morphemes show the grammatical functions of nouns in their sentences:

- (4) [ɔz əmber la:tʃo ɔz kucat]      [ha:z-od-bɔn]  
*the man-(subject) sees the dog-(object)*  
 'The man sees the dog'

- (5) [ɔ kucɔ la:tʃo ɔz əmbert]      [ha:z-unk]  
*the dog sees the man-(object)*  
 'The dog sees the man'

As mentioned above, in English it is the position in the sentence of the noun phrase *the man* or *the dog* that tells one whether the phrase is the subject or object of the verb, but in Hungarian, a noun phrase may appear either before or after the verb in a sentence and be recognized as the subject or object in either position because it is marked with a bound morpheme (the suffix [t]) if it is the direct object. (Many synthetic languages behave similarly.) Therefore, both examples below mean the same thing, even though the position of the noun phrase meaning 'the man' is different with respect to the verb meaning 'sees.'

- (6) [ɔ kucɔ la:tʃo ɔz əmbert]      [ha:z-unk]  
*the dog sees the man-(object)*  
 'The dog sees the man'

- (7) [ɔz əmbert la:tʃo ɔ kucɔ]      [ha:z-unk]  
*the man-(object) sees the dog*  
 'The dog sees the man'

Synthetic languages like Hungarian may also use bound morphemes to indicate some concepts that English signals by means of free morphemes. For example, Hungarian indicates personal possession and location by the use of suffixes attached to the stem ([ha:z], 'house'), whereas in English these concepts are expressed by the use of free morphemes. Examples are given in (8) and (9).

- (8) [ɔ ha:zunk zold]      [ha:zunk-bon]  
*the house-our green*  
 'Our house is green'

- (9) [ɔ seiked ɔ ha:zunkbon vɔn]      [ha:zunk-bon]  
*the chair-your the house-our-in is*  
 'Your chair is in our house'

### 4.3.4 The First Type of Synthetic Language: Agglutinating Languages

To be more specific, the kind of synthesis (putting together) of morphemes we find in Hungarian is known as **agglutination**. In agglutinating languages, like Hungarian, the morphemes are joined together relatively "loosely." That is, it is usually easy to determine where the boundaries between morphemes are, as shown in (10) and (11).

- |                     |                      |
|---------------------|----------------------|
| (10) [ha:z-unk-bɔn] | [ha:z-od-bɔn]        |
| <i>house-our-in</i> | <i>house-your-in</i> |
| 'in our house'      | 'in your house'      |
- 
- |                  |                   |
|------------------|-------------------|
| (11) [ha:z-unk]  | [ha:z-od]         |
| <i>house-our</i> | <i>house-your</i> |
| 'our house'      | 'your house'      |

Swahili is another example of an agglutinating language. Swahili verb stems take prefixes to indicate the person of the subject of the verb (first, second, or third) and also to indicate the tense of the verb, as in the following list of forms for the verb 'read':

- |                   |                          |                    |
|-------------------|--------------------------|--------------------|
| (12) [ni-na-soma] | <i>I-present-read</i>    | 'I am reading'     |
| [u-na-soma]       | <i>you-present-read</i>  | 'You are reading'  |
| [a-na-soma]       | <i>s/he-present-read</i> | 'S/he is reading'  |
| [ni-li-soma]      | <i>I-past-read</i>       | 'I was reading'    |
| [u-li-soma]       | <i>you-past-read</i>     | 'You were reading' |
| [a-li-soma]       | <i>s/he-past-read</i>    | 'S/he was reading' |
| [ni-ta-soma]      | <i>I-future-read</i>     | 'I will read'      |
| [u-ta-soma]       | <i>you-future-read</i>   | 'You will read'    |
| [a-ta-soma]       | <i>s/he-future-read</i>  | 'S/he will read'   |

A second characteristic feature of agglutinating languages is that each bound morpheme (ordinarily) carries only one meaning: *ni* = 'I,' *u* = 'you,' *a* = 's/he,' *na* = 'present,' etc.

### 4.3.5 The Second Type of Synthetic Language: Fusional Languages

In **fusional languages**, another subtype of synthetic language, words are formed by adding bound morphemes to stems, just as in agglutinating languages, but in fusional languages the affixes may not be easy to separate from the stem. It is often rather hard to tell where one morpheme ends and the next begins; the affixes are characteristically fused with the stem.

Spanish is a fusional language that has suffixes attached to the verb stem to indicate the person (I/you/he/she/it) and number (singular/plural) of the subject of the verb. It is often difficult to analyze a verb form into its stem and suffix, however, because there is often a fusion of the two morphemes. For example, in the following forms:

- |             |                           |
|-------------|---------------------------|
| (13) [ablo] | <i>'I am speaking'</i>    |
| [abla]      | <i>'S/he is speaking'</i> |
| [able]      | <i>'I spoke'</i>          |

the morphemes in (14) can be isolated:

- (14) [-o] first person singular present tense  
 [-a] third person singular present tense  
 [-e] first person singular past tense

However, although these forms would suggest a stem *abl-* that means 'speak,' such a form never appears in isolation in Spanish. There is no Spanish free morpheme *abl-*.

Fusional languages often differ from agglutinating languages in another way as well; agglutinating languages usually have only one meaning indicated by each affix, as noted above, but in fusional languages a single affix more frequently conveys several meanings simultaneously. Russian is a fusional language in which bound morphemes attached to verb stems indicate both the person and the number of the subject of the verb and the tense of the verb at the same time. For example, in (15) the bound form [-jet] signifies third person as well as singular and present tense:

- (15) [tʃitajet] 's/he is reading'

In (16) the suffix [-l] means singular, masculine, and past tense, simultaneously. (Compare the Swahili examples in (12), in which person and tense are signaled by separate affixes.)

- (16) [tʃital] 'he was reading'

#### 4.3.6 The Third Type of Synthetic Language: Polysynthetic Languages

In some synthetic languages, highly complex words may be formed by combining several stems and affixes; this is usually a matter of making nouns (subjects, objects, etc.) into parts of the verb forms. Such languages are called **polysynthetic**. Sora, a language spoken in India, allows such **incorporation** of objects (subjects, instruments, etc.) into verbs:

- (17) [aninpamjoten] —word of Sora  
 [anin - nam - jo - te - n] —the same word divided into morphemes  
*he catch fish non-past do*  
*'He is fish-catching'*  
*i.e., 'He is catching fish'*

- (18) [namkidtenai] —word of Sora  
 [nam - kid - te - n - ai] —the same word divided into morphemes  
*catch tiger non-past do first person agent*  
*'I will tiger-catch'*  
*i.e., 'I will catch a tiger'*

Such verbs are roughly comparable to an English construction like *baby-sit* or *trout-fish*, but the polysynthetic constructions may be more complex, including several nouns as well as a variety of other affixes:

- (19) [p̪poŋŋkoontam] —word of Sora  
 [p̪o - poŋ - koon - t - am] —the same word divided into morphemes  
*stab belly knife non-past you (sg.)*  
*'(Someone) will stab you with a knife in (your) belly'*

- (20) [jenədʒdʒadarsiəm] —word of Sora  
 [jen- ədʒ - dʒa - dar - si - əm] —the same word divided into morphemes  
*I not receive cooked rice hand you (sg.)*  
*'I will not receive cooked rice from your hands'*

The incorporated or "built-in" form of the noun is not necessarily identical to its free form. For example, in Sora, the free form of 'tiger' is [kina], that of 'hand' is [si?i], and that of 'knife' is [kondi].

# FILE 4.4

## The Hierarchical Structure of Derived Words

### 4.4.1 How Words Are Put Together

When we examine words composed of only two morphemes, a stem and an affix, we implicitly know something about the way in which the affix combined with its stem. That is, the word was formed via the addition of the affix to the stem. By itself, this fact seems neither particularly significant nor particularly interesting. After all, there are no other options. However, when a word comprises more than two morphemes, the order in which the morphemes are put together becomes a more significant question. In order to consider such questions, we first will note two facts about morphemes and lexical categories.

First, the stems with which a given affix may combine (its **input**) normally belong to the same lexical category. For example, the suffix *-able* attaches freely to verbs, but not to adjectives or nouns. Thus, we can add this suffix to the verbs *adjust*, *break*, *compare*, and *debate*, but not to the adjectives *asleep*, *lovely*, *happy*, and *strong*, nor to the nouns *anger*, *morning*, *student*, and *success*. Second, the words that are formed when an affix attaches to a stem (its **output**) also normally belong to the same lexical category. For example, the words resulting from the addition of *-able* to a verb are always adjectives. Thus, *adjustable*, *breakable*, *comparable*, and *debatable* are all adjectives.

It turns out that these two facts have an important consequence for determining the way in which words with more than one derivational affix must be formed. What it means is that you can trace the derivational history of words as though they were formed in steps, with one affix attaching to a stem at a time. Words with more than one affix can be represented as forming by means of several steps. For example, consider the word *reusable*, which is composed of a prefix *re-*, a stem *use*, and a suffix *-able*. One possible way this morphologically complex word might be formed is all at once: *re + use + able*, where the prefix and the suffix attach at the same time to the stem *use*. This cannot be the case, however, knowing what we know about how derivational affixes are restricted with respect to both their input and their output. Which attaches to *use* first, then: *re-*, or *-able*?

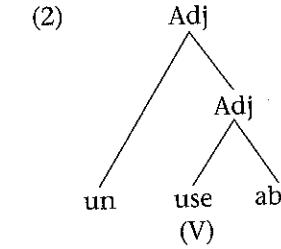
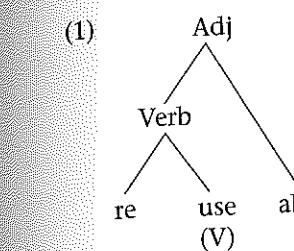
The prefix *re-*, meaning 'do again,' attaches to verbs and creates new words that are also verbs. (Compare with *redo*, *revisit*, and *rewind*.<sup>1</sup>) The suffix *-able* also attaches to verbs, but it forms words that are adjectives. (Compare with *stoppable*, *doable*, and *washable*.) When working with problems such as those described in this file, you may find it helpful to anthropomorphize the affixes a bit in your mind. For example, you can think about *re-* as the sort of thing that says, "I am looking for a verb. If you give me a verb, then I will give you another verb," and *-able* as the sort of thing that says, "I am looking for a verb. If you give me a verb, then I will give you an adjective."

<sup>1</sup>As important as considering the words that *re-* does form is considering words that it doesn't form. For example, notice that *re-* cannot grammatically combine with adjectives or with nouns:

**Adjectives:** \*rehappy \*repurple \*replentiful  
**Nouns:** \*rekitten \*rehappiness \*repencil

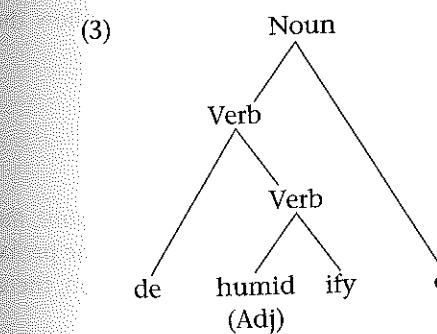
We learn from examining these two rules that *re-* cannot attach to *usable*, because *usable* is an adjective, but *re-* is "looking for" a verb. However, *re-* is able to attach to the root *use*, because *use* is a verb. Since *reuse* is also a verb, it can then serve as a stem to take *-able*. Thus, the formation of the word *reusable* is a two-step process whereby *re-* and *use* attach first, and then *-able* attaches to the word *reuse*. In this way, the output of one affixation process serves as the input for the next. The restrictions that each affix is subject to can help us determine the sequence of derivation.

Words that are "layered" in this way have a special type of structure characterized as **hierarchical**. This hierarchical structure can be schematically represented by a tree diagram that indicates the steps involved in the formation of the word. The tree for *reusable* appears in (1).



Now consider the word *unusable*. This word also contains three morphemes, so it is tempting to say that they will be put together in the same order as were the morphemes in *reusable*. However, notice that unlike *reuse*, *\*unuse* is not a word, because in this case, *un* needs to have its input be an adjective. (Compare with *unhappy*, *unkind*, and *untrue*.) Fortunately, when *-able* attaches to verbs, it forms adjectives! Once the adjective *useable* has been formed, the needs of *un-* are met, and it is able to attach in order to form the target word, *unusable*. A tree for this derivation showing the hierarchical structure of *unusable* appears in (2).

Notice that these two trees, that is, the ones in (1) and (2), do not have the same shape. The shape of the tree is particular to the order in which morphemes are combined. Using the tools you have been given, though, it is possible to deduce the hierarchical structures even for very complex words. In (3) there is an example of a word with four morphemes; try to determine for yourself why this is the correct structure for the word *dehumidifier*.



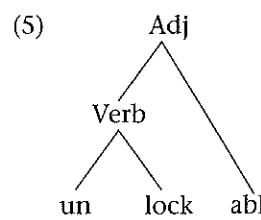
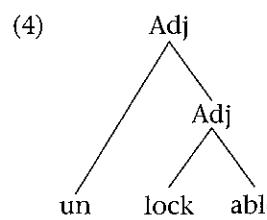
### 4.4.2 Ambiguous Morphemes and Words

Interestingly, some words are **ambiguous**; that is, they can be associated with more than one meaning (see Section 5.5.3). When we examine their internal structure, we find an explanation for this: their structure may be analyzed in more than one way. Consider, for example, the word *unlockable*. This could mean either 'not able to be locked' or 'able to be unlocked.' If we made a list to determine the parts of speech the affix *un-* attaches to, we would discover that there are actually two prefixes which have the form *un- /ʌn/*. The first combines with adjectives to form new adjectives and means 'not.' (Compare with *unaware*,

(*unintelligent*, or *unwise*.) The second prefix *un-* combines with verbs to form new verbs and means ‘do the reverse of.’ (Compare with *untie*, *undo*, or *undress*.)

Even though these prefixes sound alike, they are entirely different morphemes. Because of these two different sorts of *un-* in English, *unlockable* may be analyzed in two different ways. First, the suffix *-able* may join with the verb *lock* to form the adjective *lockable*, meaning ‘able to be locked’; *un-* may then join with this adjective to form the new adjective *unlockable*, with the meaning ‘not able to be locked.’ This way of forming *unlockable* is schematized in (4).

In the second *unlockable*, the prefix *un-* joins with the verb *lock* to form the verb *unlock*, meaning ‘do the reverse of lock.’ The suffix *-able* then joins with this verb to form the adjective *unlockable*, with the meaning of ‘able to be unlocked.’ This manner of forming *unlockable* is represented in the tree in (5).



#### 4.4.3 Morphemes That Can Attach to More than One Lexical Category

There are a few prefixes that do not attach exclusively to one lexical category. For example, consider the prefix *pre-*. *Pre-* attaches to verbs and results in a change of meaning in the words it derives, although the lexical category itself does not change, as the following examples show:

- |              |                        |
|--------------|------------------------|
| (6) preexist | preboard (an airplane) |
| predetermine | predestine             |
| premeditate  | prescreen (a movie)    |

However, there are examples of words with the prefix *pre-* that do not follow the same pattern as those cited above:

- |               |         |
|---------------|---------|
| (7) preseason | predawn |
| prewar        | pregame |

In these words, *pre-* attaches to a noun and forms an adjective (*the preseason game*, *the prewar propaganda*, *the pregame warm-up*). However, the meaning associated with the prefix is the same as in *preexist*, *preboard*, etc. (although its function is different). In addition, there are sets of words such as those in (8).

- |                |             |
|----------------|-------------|
| (8) prefrontal | predental   |
| preinvasive    | prehistoric |

In each of these words, *pre-* is attaching to an adjective, forming adjectives, and again the same meaning is associated with the addition of *pre-* as in *preexist*, *preboard*, etc. Even though it is generally the case that a given affix will be subject to one particular set of conditions on the lexical category which it can attach to and on the lexical category that its resulting derived words will belong to, some morphemes have a much wider range of combinatorial possibilities (historically this may represent an extension from one or two of the productive

uses). Such must be the case with *pre-*. Note, however, that what *pre-* combines with and what the combination produces are not totally random or arbitrary. When *pre-* attaches to verbs, it forms only verbs. When it attaches to nouns, it forms only adjectives, and when it attaches to adjectives, it forms only adjectives. So, it is advisable to consider many examples when attempting to determine the generalization about how a given affix combines with stems.

## Morphological Analysis

### 4.5.1 The Nature and Goals of Morphological Analysis

When a linguist comes in contact with a new language, one of his or her major tasks is to discover the meaningful units out of which the language is composed. Just as with discovering phonemes and allophones, it is important that the linguist have procedures for discovering these minimal units, since it is impossible to isolate morphemes by intuition.

For example, the Classical Greek word [grap<sup>h</sup>ɔ:] means 'I write,' but if the word is considered in isolation, the linguist has no way of knowing what sound or sequence of sounds corresponds to 'I' and which sequence corresponds to 'write.' In fact, the linguist has no way of knowing even whether the word can be broken down into obvious parts or whether this form was created through alternation or suppletion. It is only by comparing [grap<sup>h</sup>ɔ:] with another form, for instance, [grap<sup>h</sup>e:] 's/he writes,' that one is able to determine what the morphemes of these Greek words are. Looking at these two forms together allows us to hypothesize that [grap<sup>h</sup>] is the part that means 'write.'

Comparison, then, is the best way to begin morphological analysis. But, of course, you will not want to compare just any forms. Comparing a Greek word like [pʰe:mɪ] 'to speak' with [grap<sup>h</sup>ɔ:] will not provide much information, since the forms are so dissimilar and seem to have no morpheme in common. What must be compared are partially similar forms, in which it is possible to recognize recurring units. In this way we can identify the morphemes from which words are composed.

Let us consider our Classical Greek example once more. If we compare [grap<sup>h</sup>ɔ:] with [grap<sup>h</sup>e:] 'he writes,' we note similarities between the forms. The sequence [grap<sup>h</sup>-] appears in both forms [grap<sup>h</sup>-ɔ:] and [grap<sup>h</sup>-e:], and if we compare these to the English correspondences, we find that the meaning 'write' appears in both 'he writes' and 'I write.' From this, we are justified in concluding that [grap<sup>h</sup>-] means 'write,' since [grap<sup>h</sup>-] and *write* are constants in both the English and Greek. Furthermore, since the final vowels in both Greek forms contrast—and since this contrast is accompanied by a difference in meaning in our English correspondence—we can safely assume that the difference between the vowels in Classical Greek are suffixes that correspond to differences in meaning in our English translation. Therefore we determine that 'I' is marked by [-ɔ:] and 'he' is marked by [-e:]. In sum, then, the initial step in doing morphological analysis is to compare and contrast partially similar forms.

To give yourself practice, identify and translate the morphemes in the Hungarian data in (1) and (2). ([j] is a voiced palatal stop.) You should be able to identify four distinct Hungarian morphemes: two roots, one prefix, and one suffix.

- |           |                 |
|-----------|-----------------|
| (1) [hɔz] | 'house'         |
| [zchɛ]    | 'a house'       |
| [hɔz]     | 'his/her house' |

(2)	[bor]	'wine'
	[ɛjbor]	'a wine'
	[borɔ]	'his/her wine'

Notice that in both the Greek and the Hungarian examples, there have been similarities in both form and meaning between the phonological forms we have considered. In order to perform a successful morphological analysis, both form and meaning similarities are necessary. To demonstrate this point, compare the following English words in (3). (We have not provided glosses because these are words of English.)

- |                   |               |
|-------------------|---------------|
| (3) work – worker | fast – faster |
|-------------------|---------------|

We notice a similarity in form: the morpheme spelled *<er>* and pronounced [ɪ] for both [fæstɪ] and [wɪkɪ]. However, if we think about it for a minute, it is apparent that *-er* has two different meanings even though phonetically it looks like the same morpheme. The *-er* in *worker* is the same *-er* that shows up in words like *painter*, *killer*, and *lover*. In each of these cases, *-er* attaches to verbs to derive a noun and means something like 'one who paints,' 'one who kills,' 'one who loves,' etc. The suffix *-er* in these cases is a derivational suffix known as the agentive morpheme.

The *-er* in *faster*, on the other hand, is the same *-er* that shows up in words like *wider*, *longer*, *colder*, *prettier*, etc. In each of these cases, *-er* attaches to adjective stems to create the comparative form of that adjective. The suffix *-er* in these cases is an inflectional suffix known as the comparative morpheme.

We will want to claim, then, that [ɪ] represents two separate morphemes—[ɪ] as an agent marker, and [ɪ] as a comparative marker—even though they are the same phonetically, i.e., homophonous morphemes. The [ɪ] that is added to verbs to yield nouns and the [ɪ] that is added to adjective stems to yield their comparative forms clearly must be distinct morphemes. This example shows us that it is not sufficient to compare words based on similarity of form alone. There must also be a similarity in meaning (in the case of derivational morphology) or function (in the case of inflectional morphology).

On the flip side, it is also important to recognize that sometimes a similarity in meaning is not matched by an exact similarity in form. Compare the set of words in (4a–e). We notice that each word has a prefix that means 'not.'

- |                  |                 |
|------------------|-----------------|
| (4) a. imprecise | [ɪmprɛsɪsɪ]     |
| b. inadequate    | [ɪnədɛkwət]     |
| c. incomplete    | [ɪnɪkəmplɪt]    |
| d. irresponsible | [ɪnrɪspansɪbɪl] |
| e. illegible     | [ɪlɪdʒɪbl]      |

The problem here is the inverse of the problem in (3). Whereas in (3) we had the same phonetic forms representing two different meanings, in (4) we have five different phonetic forms with the same meaning. Since the phonetic forms of the morpheme meaning 'not' can be predicted on the basis of the phonetic environment, i.e.,

- [ɪm] before labials—[p], [b], [m]
- [ɪŋ] before velars—[k], [g]
- [ɪɹ] before [ɪ]
- [ɪɿ] before [ɿ]
- [ɪn] elsewhere (before vowels and other consonants),

we conclude that even though the forms differ phonetically, they belong to the same morpheme since they have the same meaning. We call [ɪm], [ɪŋ], [ɪn], [ɪu], and [ɪl] **allomorphs** of the same morpheme. Another example of allomorphy in English is the plural morpheme, which is realized as [s], [z], or [əz], depending on the form of the root to which it attaches (see Section 3.3.4).

#### 4.5.2 Procedure for Performing Morphological Analysis

Now that we have considered several examples of morphological analysis, it is time to spell out exactly what we are trying to do and how we go about doing it. Our goal is this: given a set of data in phonetic representation, perform a morphological analysis of the forms in the data, identifying each morpheme, its meaning, and its type. You should also be able to tell where a morpheme appears with respect to other morphemes in the word. Is it a prefix, suffix, etc.? Does it attach directly to the root, or does it attach after or before another morpheme?

Now it is time to consider the procedure. It can be summed up in three steps.

1. Isolate and compare forms that are partially similar, as we did for Classical Greek [grap<sup>h</sup>-eɪ] and [grap<sup>h</sup>-ɔɪ].
2. If a single phonetic form has two distinct meanings, it must be analyzed as representing two different morphemes (as in (3)).
3. If the same function and meaning are associated with different phonetic forms, these different forms all represent the same morpheme (i.e., they are allomorphs of the morpheme), and the choice of form in each case may be predictable on the basis of the phonetic environment (as in (4)).

#### 4.5.3 Some Cautionary Notes

People frequently assume that languages are pretty much the same in terms of what each language marks inflectionally. For example, English speakers often assume that all languages mark the plurals of nouns with an ending, or that the subject and the verb agree in person and number in other languages. This is simply not the case.

For example, Tagalog does not usually mark the plural of nouns (in most cases, the number is clear from the context). When it is necessary to be specific, a separate word, *mga*, is used to indicate plural.

- (5) [aŋ bata?] 'the child'  
[aŋ mga bata?] 'the children'

When a number is specifically mentioned, no plural marker appears in Tagalog, although the plural marker is obligatory in English (\*four dog is ungrammatical). On the other hand, Tagalog has some markers that English does not. ([-ŋ] is a "linker" that links numerals and adjectives to the nouns they modify; English does not use this type of device.) Examples of both phenomena can be seen in (6).

- (6) [dalawa] 'two' [dalawaŋ bata?] 'two children'  
[lima] 'five' [limaŋ bata?] 'five children'

English marks subject-verb agreement (e.g., *I eat* versus *he eats*; see File 5.2), but Tagalog does not. In Tagalog, the same form of the verb is used with all subjects, as in (7).

- (7) [kumakain ako] 'eat I' = 'I eat'  
[kumakain siy] 'eat he' = 'he eats'

Other languages also make distinctions that English doesn't. While English distinguishes only singular and plural verbs, some languages have a dual verb form for when just two people are involved. Consider Sanskrit *juhomi* 'I sacrifice,' *juhuvas* 'we (two) sacrifice,' and *juhumas* 'we (more than two) sacrifice.'

Some languages make another distinction in first-person plural pronouns where English has only *we*. Notice that English *we* in *we are going*, for example, may include everyone in the group the hearer is addressing (i.e., *we* = every one of us), or it may include only some hearers (i.e., *we* = 'I and (s)he,' but not 'you'). Many languages distinguish these two *we*'s: Tagalog has *tayo* (*inclusive*, i.e., 'you and I') and *kami* (*exclusive*, i.e., 'he and I').

Comanche, a Native American language of the Uto-Aztecan family, makes a number of other distinctions that English doesn't. In addition to a singular/dual/plural distinction and an inclusive/exclusive distinction, Comanche also makes a distinction between visible/not visible and near/far. Thus, if you are referring to a thing that is within your view, you use a different form than if the thing is not visible to you. Likewise, a nearby object is designated with a pronoun different from the one used for an object that is far away. Consider the following subject forms:

#### (8) Elements of the Comanche pronoun system

##### *Singular/Dual/Plural Distinction*

[ini]	'you (singular)'
[nikwi]	'you (two)'
[mii]	'you (plural)'

##### *Inclusive/Exclusive Distinction*

[taa]	'we (inclusive)'
[nini]	'we (exclusive)'

##### *Visible/Not Visible*

[maʔ]	'it (visible)'
[?uʔ]	'it (invisible)'

##### *Near/Far Distinction*

[?iʔ]	'it (proximate)'
[?oʔ]	'it (remote)'

The lesson to be learned here is that you cannot assume that another language will make distinctions in the same way that English does. For example, while every language has some method of indicating number, not all languages do so in the same way or under the same circumstances. As we've seen, English uses an affix, Tagalog uses a separate word, and Indonesian reduplicates the word to show plurality (see File 4.2). Nor can you assume that the distinctions English makes are the only ones worth making. Languages must be examined carefully on the grounds of their own internal structures.

Finally, although the exercises for File 4.6 of this book will generally involve affixation, do not forget that often in the world's languages, morphological marking will happen through some other process.

# FILE 4.6

## Practice

### File 4.1—Words and Word Formation

#### Exercises

- Refer to the cartoon at the beginning of this chapter and answer the following questions:
  - Does *funeral* contain the root morpheme *fun*? To answer this, consider whether *fun* and *funeral* are semantically related, and whether the orthographic sequence <*fun*> is pronounced the same in both cases.
  - Do you think the relationship between *fun* and *funeral* is more like the relationship between *cat* and *catty*, or more like the relationship between *cat* and *catalog*?
  - Why is it ironic that the first three letters of *funeral* spell *fun*? Explain with reference to the meanings of the two words.
- The following words are made up of either one or two morphemes. Isolate the morphemes and decide for each if it is free or bound, what kind of affix, if any, is involved (i.e., is it a prefix or a suffix?), and (where applicable) if the affix is inflectional or derivational.
 

a. cats	d. catsup	g. succotash	j. entrust
b. unhappy	e. milder	h. bicycle	k. signpost
c. rejoin	f. hateful	i. greedy	l. spacious
- Divide the words below into their component morphemes and give the information about the morphemes as you did in (2). (Note: Words may consist of one, two, or more than two morphemes.)
 

a. comfortable	d. reconditioned	g. thickeners
b. Massachusetts	e. unidirectional	h. nationalization
c. environmentally	f. senseless	i. unspeakably
- In each group of words that follow, two words have the same morphological structure, one has a different suffix from those two, and one has no suffix at all. Your task is to tell which two words have the same suffix, which one has a different suffix, and which has no suffix at all. Having done this, tell the meaning of each suffix. (You may find that they become more difficult as you go along.)

Example:   rider   -er is a derivational suffix meaning 'one who. . .'  
              colder   -er is an inflectional suffix marking the comparative.  
              silver   There is no suffix.  
              smoker   This is the same -er as in *rider*.

(cont.)

### File 4.6 Practice

- |             |              |
|-------------|--------------|
| a. nicer    | e. youngster |
| painter     | faster       |
| runner      | monster      |
| feather     | gangster     |
| <br>        | <br>         |
| b. clocks   | f. wrestling |
| Nick's      | handling     |
| hearts      | fling        |
| glass       | duckling     |
| <br>        | <br>         |
| c. friendly | g. nifty     |
| sadly       | ducky        |
| softly      | thrifty      |
| silly       | lucky        |
| <br>        | <br>         |
| d. sons     | h. given     |
| lens        | maven        |
| vans        | wooden       |
| runs        | taken        |
- Are the root morphemes in each pair below pronounced the same? Different phonetic shapes of the same stem (or affix, for that matter) are called **allomorphs** (example: in *malign/malignant*, [məlɪŋ]/[məlɪgn̩] are (root) allomorphs). Identify any allomorphs that you uncover.  
Example: *malign/malignant*: [məlɪŋ]/[məlɪgn̩]
  - a. autumn/autumnal  
 b. hymn/hymnal  
 c. damn/damnation  
 d. condemn/condemnation  
 e. divide/divisible  
 f. profane/profanity  
 g. serene/serenity  
 h. receive/receptive
  - The television show *The Simpsons* coined many new words by using morphology in novel ways. Two examples are *embiggens*, as in "A noble spirit embiggens the smallest man," and *introubleating*, as in "One Springfield man is treating his wife to an extra-special Valentine's Day this year, and introubleating the rest of us." Note that although these are novel words, they are similar to other words of English: *embiggens* is similar to *emboldens*, and *introubleating* is similar to *infuriating*. For each of these two words, perform the following tasks:
    - Break it up into its component morphemes.
    - Provide the meaning of each morpheme and state whether it is free or bound.

#### Discussion Question

- Some people describe morphology as the study of how words are built up; others describe it as the study of how words are broken down. What assumptions does each of these two descriptions make about how words are stored in our mental lexicons? Based on what you know so far, is one of these descriptions more or less accurate? Why do you think so? Come back and revisit this question once you have read the entire chapter.

## File 4.2—Morphological Processes

### Exercises

#### 8. Bontoc

Consider the following data from Bontoc, a Malayo-Polynesian language spoken in the Philippines. These data show an example of derivational morphology in which an adjectival root is turned into a verb. What type of affix is used to form the verb? Describe its placement in the word.

[fikas]	'strong'	[fumikas]	'he is becoming strong'
[kilad]	'red'	[kumilad]	'he is becoming red'
[bato]	'stone'	[bumiato]	'he is becoming stone'
[fusul]	'enemy'	[fumiusul]	'he is becoming an enemy'

9. Imagine that the English suffix *-ful* were instead an infix. Where might it attach in a morpheme like *hope*? Like *pain*? Like *beauty*? (Focus on the pronunciation of the forms, rather than their spelling.) How would you know where to place the infix? Notice that there are a limited number of pronounceable options.
10. For each of the morphological processes explained in the text—affixation, compounding, reduplication, alternation, and suppletion—give an example from English or from your native language that is not given in the text. You will need to provide both the base form and the inflected or derived form for each example.
11. For each of the following words of English, tell what the root word is and the process through which the word was formed.
 

a. bound	f. discover
b. toenail	g. mama
c. Sarah's	h. mice
d. were	i. ladybug
e. undomesticated	j. rang
12. In Catalan, the form for 'to go' is [əna], and the form for 'I go' is [batʃ]. Which morphological process is this an example of? How do you know?
13. The forms for 'dancer' and 'student' in ASL are shown in (a) and (b).

- i. What part of the **meaning** of 'student' and 'dancer' is similar? (*Hint:* Ask yourself, What is a dancer? What is a student?)
- ii. What part of the **form** of these two signs is similar?
- iii. Which morphological process is responsible for the formation of the signs DANCER and STUDENT? How do you know?

#### a. ASL: STUDENT

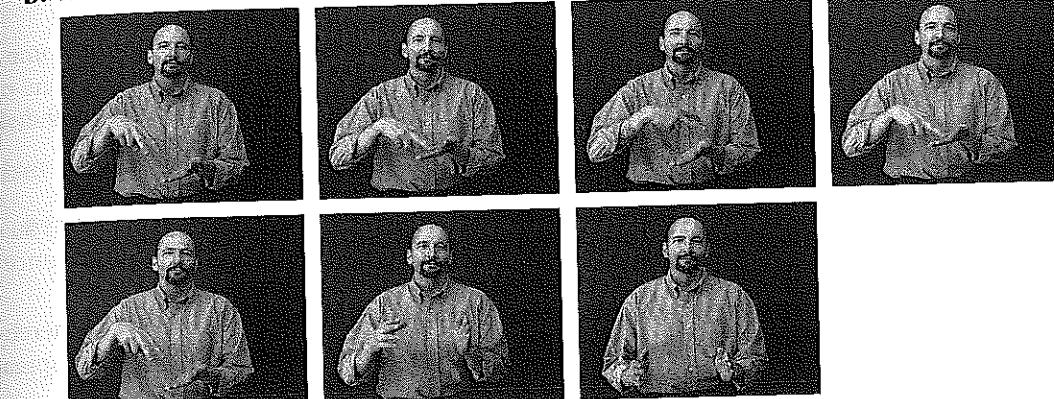


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(cont.)

## File 4.6 Practice

#### b. ASL: DANCER



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14. Refer to image (7) in File 2.7. Explain, as specifically as you can, how the form for the uninflected sign MEET differs from the form of the inflected sign I MEET YOU. What is the simultaneous affix that is used in the sign I MEET YOU?

15. i. In Hebrew, the following pattern is found in the derivation of color terms. (Pay particular attention to the consonants; the vowel change is not as important to this data set.) Which morphological process is this an example of? How do you know?

[lavan]	'white'	[ivanvan]	'whitish'
[kaxol]	'blue'	[kxalxal]	'bluish'
[jayok]	'green'	[jyakyak]	'greenish'
[tahov]	'yellow'	[tshavhay]	'yellowish'
[vayod]	'pink'	[vyadyad]	'pinkish'
[saxoy]	'black'	[saxayxay]	'blackish'

- ii. The Hebrew word for 'red' is [adom]. Based only on the data above, what would you predict the word for 'reddish' to be?
- iii. The actual Hebrew word for 'reddish' is [admumi]. Is this word at all similar to what you predicted? If so, how? Can you guess a reason for why the actual word might be different from what you predicted? (Do not attempt to explain why it takes the form that it does; just try to explain why the expected pattern may have failed.)

### Discussion Questions

16. i. Look again at the data given in Exercise 15 and consider this new fact: the Hebrew word for the color 'violet' is [sagol]. Based only on the data above, what would you expect that the word [sgalgal] would mean?

- ii. The word [sgalgal] actually means 'oval.' Can you think of any examples in English or some other language where you might predict, based on morphological principles, that a form would mean one thing, but in fact it turns out to mean something else? What do these sorts of cases tell us about morphology and the lexicon of a language?

17. Assume that the English word *raspberry* can be analyzed into *rasp* + *berry* and *cranberry* into *cran* + *berry*. Discuss how these two words behave differently from other morphologically complex English words. Is this process more like affixation, or is it more like compounding? How is this process similar to each? How is it different from each?

**Activity**

- 18.** There are some cases in English where a certain adjective-noun pair has become a compound noun for some speakers but is still two separate words for others. One of these is *cream cheese*. Some speakers put a stress only on the first syllable, while others treat it as two words and give each its own stress.

Construct a survey:

- Choose a number of noun-adjective pairs that are compound nouns for you or one of your classmates. Your goal will be to find out how other people pronounce these as compounds or as separate words.
- Design questions such that you do not have to say the word yourself (thereby biasing the person responding); for example, "What do you call the white spread that people eat on bagels?"
- Collaborate with others in your class: each of you should ask your set of questions to some number of people (to be specified by your instructor).
- Afterwards, share your findings with your classmates.

**File 4.3—Morphological Types of Languages****Discussion Question**

- 19.** Often, when people are exposed to languages with properties that are different from those of languages that they already know, their immediate reaction is to think that the new type of language is much more complicated. Of course, this is true regardless of which type of language they speak to begin with. For each of the four types of language presented in File 4.3, list some attributes of that kind of language that would make it easier to learn or to understand the grammar.

**Activity**

- 20.** With a group of your classmates, make up a fragment of a synthetic language. You should decide whether it will be agglutinative or fusional. Perform the following steps in order to create your language fragment. Be sure to write out the decisions that you make at each step along the way.

- i. First, come up with a name for your language.
- ii. Next, create a small lexicon. It will contain ten words; you can choose to create ten nouns, ten verbs, or five of each. For each of your lexical items, you will need to specify a phonological form (using the IPA) and a meaning (using an English gloss).
- iii. Decide on four morphological functions that you will want to be able to perform: two should be derivational, and two should be inflectional. (Examples: marking nouns for nominal case; marking verbs as past tense, turning nouns into adjectives; turning verbs into nouns, etc.) Don't feel the need to restrict yourself to morphological functions found in English!
- iv. Decide what morphological process your language will use to perform each of these functions. Don't forget to specify how—if at all—these processes will interact with your language's phonology!
- v. Now, write all of the possible derived forms and inflected forms that you can make based on the words of your language and the morphological rules that you have created. For each, tell both the form (using the IPA) and the meaning (using an English gloss).

(cont.)

- vi. Is your language fusional or agglutinative? What evidence shows that this is the case?

**File 4.4—The Hierarchical Structure of Derived Words****Exercises**

- 21.** All of the words below contain two morphemes: a root and a suffix. First, identify the root in each word and the suffix. Then state the lexical category of the root word and the lexical category of the whole word. (*Hint:* In each list, the lexical categories are the same for all three words.)

- |               |             |
|---------------|-------------|
| a. government | d. messy    |
| speaker       | bookish     |
| contemplation | mountainous |
| b. fictional  | e. calmest  |
| childish      | lovelier    |
| colorful      | sillier     |
| c. happiness  |             |
| rarity        |             |
| creativity    |             |

- 22.** Isolate the affixes and roots in the following groups of words. Then name the lexical category of the root, and say whether the affixation results in a word belonging to a different lexical category (and if so, which one).

- |             |           |           |              |
|-------------|-----------|-----------|--------------|
| a. spiteful | b. unsure | c. retake | d. stoppable |
| healthful   | untrue    | review    | fixable      |
| truthful    | unhappy   | relive    | laughable    |

- 23.** From the examples given for each of the following suffixes, determine: (i) the lexical category of the word whose stem the suffix combines with, and (ii) the lexical category of the words resulting from the addition of the suffix.

- a. **-ify:** solidify, intensify, purify, clarify, rarefy
- b. **-ity:** rigidity, stupidity, hostility, intensity, responsibility
- c. **-ize:** unionize, terrorize, hospitalize, crystallize, magnetize
- d. **-ive:** repressive, active, disruptive, abusive, explosive
- e. **-ion:** invention, injection, narration, expression, pollution
- f. **-less:** nameless, penniless, useless, heartless, mindless

- 24.** Draw tree diagrams for each of the following words:

- |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|
| g. a. disappearance   | j. international      | s. unmistakable       |
| b. unaffordable       | k. misunderstandable  | t. insincerity        |
| c. un-American        | l. reconstruction     | u. dysfunctional      |
| d. manliness          | m. unrespectable      | v. inconclusive       |
| e. impersonal         | n. nonrefundable      | w. premeditatedly     |
| f. irreplaceability   | o. mismanagement      | x. overgeneralization |
| g. oversimplification | p. underspecification | y. reformer           |
| h. unhappiness        | q. restatement        | z. infertility        |
| i. decommission       | r. inflammability     | aa. dishonesty        |

- 25.** Consider the two columns of words below. What do the words in each column have in common? Come up with two more words that go in each column. Do the words in both columns have the same suffix, or do the words on the right have a different suffix from those on the left? Justify your answer.

teacher	stapler
baker	juicer
singer	copier
writer	toaster
fighter	hole-puncher
painter	lighter

- 26.** Consider the English prefix *anti-*. Make a list of words you can think of that begin with *anti-*. Try to come up with at least ten words. (You may use a dictionary if you like.) What lexical categories contain words that can serve as root words for *anti-*? In each case, what are the lexical categories of the output?

- 27.** The made-up words *embiggens* and *introubleating* were introduced in question 6. Draw tree diagrams for these two words.

### Activity

- 28.** Make up your own English word that you've never heard before that is composed of at least four morphemes. (If you can't think of a word right now, you are welcome to use *semiunducklike*, as in "A rhinoceros isn't like a duck at all, but a goose is only semi-unducklike." However, it's more fun to make your own word!)

- Indicate the morphemes that make it up.
- Provide the meaning of each morpheme and state whether it is (1) free or bound; (2) a root, prefix, or suffix; and (3) derivational, inflectional, or neither.
- Provide the meaning of the whole word.
- Draw a tree diagram showing how it was put together.

### File 4.5—Morphological Analysis

#### Exercises

##### Beginning Exercises

###### 29. Isthmus Zapotec

Examine the following data from Isthmus Zapotec, a language spoken in Mexico. Answer the questions that follow.

a. [palu]	'stick'	g. [spalube]	'his stick'	m. [spalulu]	'your stick'
b. [ku:bä]	'dough'	h. [sku:babe]	'his dough'	n. [sku:balu]	'your dough'
c. [tapa]	'four'	i. [stapabe]	'his four'	o. [stapalu]	'your four'
d. [geta]	'tortilla'	j. [sketabe]	'his tortilla'	p. [sketalu]	'your tortilla'
e. [bere]	'chicken'	k. [sperebe]	'his chicken'	q. [sperelu]	'your chicken'
f. [do?o]	'rope'	l. [sto?obe]	'his rope'	r. [sto?olu]	'your rope'

- i. Isolate the morphemes that correspond to the following English translations:

- \_\_\_\_\_ possession (genitive)  
\_\_\_\_\_ third person singular  
\_\_\_\_\_ second person plural

(cont.)

### File 4.6 Practice

- ii. List the allomorphs for the following translations:

\_\_\_\_\_ 'tortilla' \_\_\_\_\_ 'rope'  
\_\_\_\_\_ 'chicken'

- iii. What phonological environment triggers the alternation between these allomorphs?

#### 30. Turkish

Examine the following data from Turkish and answer the questions that follow.

a. [deniz]	'an ocean'	i. [elim]	'my hand'
b. [denize]	'to an ocean'	j. [eller]	'hands'
c. [denizin]	'of an ocean'	k. [difler]	'teeth'
d. [eve]	'to a house'	l. [disimizin]	'of our tooth'
e. [evden]	'from a house'	m. [dislerimizin]	'of our teeth'
f. [evdžikden]	'from a little house'	n. [eldzike]	'to a little hand'
g. [denizdžikde]	'in a little ocean'	o. [denizerimizde]	'in our oceans'
h. [elde]	'in a hand'	p. [evdžiklerimizde]	'in our little houses'

- i. Give the Turkish morpheme that corresponds to each of the following translations:

\_\_\_\_\_ 'an ocean' \_\_\_\_\_ 'in' \_\_\_\_\_ 'my'  
\_\_\_\_\_ 'a house' \_\_\_\_\_ 'to' \_\_\_\_\_ 'of'  
\_\_\_\_\_ 'a hand' \_\_\_\_\_ 'from' \_\_\_\_\_ 'our'  
\_\_\_\_\_ 'a tooth' \_\_\_\_\_ 'little' \_\_\_\_\_ (plural marker)

- ii. What is the order of morphemes in a Turkish word (in terms of noun stem, plural marker, etc.)?

- iii. How would one say 'of our little hands' in Turkish?

#### 31. Luiseño

Examine the following data from Luiseño, a Uto-Aztecan language of Southern California, and answer the questions that follow.

a. [nokaamaj]	'my son'	m. [pokaamaj]	'his son'
b. [?oki]	'your house'	n. [poki]	'his house'
c. [potaana]	'his blanket'	o. [notaana]	'my blanket'
d. [?ohuukapi]	'your pipe'	p. [pohuukapi]	'his pipe'
e. [?otaana]	'your blanket'	q. [nohuukapi]	'my pipe'
f. [noki]	'my house'	r. [?okaamaj]	'your son'
g. [?omkim]	'your (pl.) houses'	s. [pompeewum]	'their wives'
h. [nokaamajum]	'my sons'	t. [pomki]	'their house'
i. [popeew]	'his wife'	u. [tsampeewum]	'our wives'
j. [?opeew]	'your wife'	v. [tsamhuukapim]	'our pipes'
k. [?omtaana]	'your (pl.) blanket'	w. [?omtaanam]	'your (pl.) blankets'
l. [tsamhuukapi]	'our pipe'	x. [pomkaamaj]	'their son'

- i. Give the Luiseño morpheme that corresponds to each English translation. Note that the plural marker has two allomorphs; list them both.

\_\_\_\_\_ 'son' \_\_\_\_\_ 'my' \_\_\_\_\_ 'their'  
\_\_\_\_\_ 'house' \_\_\_\_\_ 'his' \_\_\_\_\_ (plural marker)  
\_\_\_\_\_ 'blanket' \_\_\_\_\_ 'your (sg.)' \_\_\_\_\_ 'pipe'  
\_\_\_\_\_ 'wife'

\_\_\_\_\_ 'your (pl.)'

- ii.** Are the allomorphs of the plural marker phonologically conditioned?  
**iii.** If so, what are the conditioning environments?

### 32. Quiché

Some sentences from Quiché, a Native American language spoken in Guatemala, Central America, are given with their English translation in (a)–(h). Analyze the morphemes in these sentences and then fill in the exercises that follow the language data. Note that [x] is a voiceless velar fricative.

#### Quiché

- a. [kiŋsikíx le líbr]
- b. [kusikíx le líbr]
- c. [kiŋwetamáx le kém]
- d. [kataxín kiŋwetamáx le kém]
- e. [kataxín kawetamáx le kém]
- f. [ʃiŋwetamáx]
- g. [ʃuwetamáx le kém]
- h. [ʃasikíx le líbr iwír]

#### English

- 'I read (present tense) the book'
- 'He reads the book'
- 'I learn the (art of) weaving'
- 'I continually learn the (art of) weaving'
- 'You continually learn the (art of) weaving'
- 'I learned (it)'
- 'He learned the (art of) weaving'
- 'You read the book yesterday'

- i.** Fill in the blanks with the corresponding Quiché morphemes:

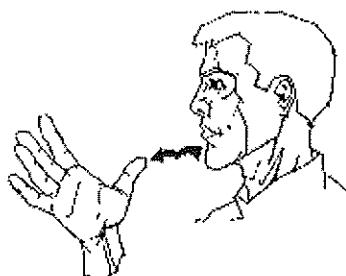
_____ 'I'	_____ 'learn'	_____ (present tense)
_____ 'he'	_____ 'read'	_____ (past tense)
_____ 'you'	_____ 'the'	_____ 'continually'
_____ 'book'	_____ 'weaving'	_____ 'yesterday'

- ii.** What is the order of Quiché morphemes (in terms of subject, verb, object, and tense marker)?

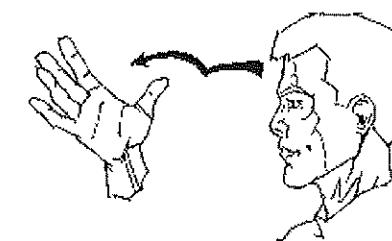
### 33. American Sign Language

Each of the four signs below includes one affix. The two signs on the left have the same affix. The two signs on the right share a different affix.

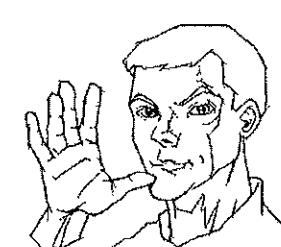
a. GRANDMOTHER



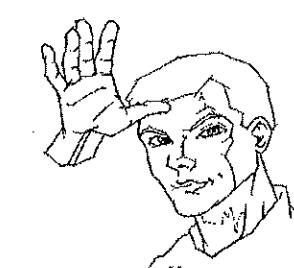
c. GRANDFATHER



b. MOTHER



d. FATHER



- i.** Which phonological parameter differentiates these two affixes: place of articulation, movement, handshape, hand orientation, or non-manual marker?  
**ii.** Describe the difference in form between the affix in the signs on the left and the affix in the signs on the right.  
**iii.** Are these two affixes prefixes, suffixes, infixes, or simultaneous affixes?  
**iv.** What is the meaning of the affix used on the left? What is the meaning of the affix used on the right?

### 34. Michoacan Aztec

Examine the following words from Michoacan Aztec, a language of Mexico, and answer the questions that follow.

- |                |              |                 |                  |
|----------------|--------------|-----------------|------------------|
| a. [nokali]    | 'my house'   | f. [mopelo]     | 'your dog'       |
| b. [nokalimes] | 'my houses'  | g. [mopelomes]  | 'your dogs'      |
| c. [mokali]    | 'your house' | h. [ikwahmili]  | 'his cornfield'  |
| d. [ikali]     | 'his house'  | i. [nokwahmili] | 'my cornfield'   |
| e. [nopelo]    | 'my dog'     | j. [mokwahmili] | 'your cornfield' |

- i.** Fill in the blanks with the corresponding Michoacan morphemes:

_____ 'house'	_____ 'my'
_____ 'dog'	_____ 'your'
_____ 'cornfield'	_____ 'his'
_____ (plural marker)	

- ii.** What is the English translation for the Michoacan word [ipelo]?

- iii.** How would you say 'his cornfields' in Michoacan?

### 35. Cebuano

The following nouns are from Cebuano, a language of the Philippine Islands. Examine them and answer the questions that follow.

- |              |                    |                |                        |
|--------------|--------------------|----------------|------------------------|
| a. [bisaja]  | 'a Visayan'        | f. [binisaja]  | 'the Visayan language' |
| b. [inglis]  | 'an Englishman'    | g. [ininglis]  | 'the English language' |
| c. [tagalog] | 'a Tagalog person' | h. [tinagalog] | 'the Tagalog language' |
| d. [ilocano] | 'an Ilocano'       | i. [inilokano] | 'the Ilocano language' |
| e. [sibwano] | 'a Cebuano'        | j. [sinibwano] | 'the Cebuano language' |

- i.** State the rule (in words, precisely) for deriving language names from the names of ethnic groups.

- ii.** What type of affixation is this?

**36. Isleta**

Consider the following data from Isleta, a dialect of Southern Tiwa, a Native American language spoken in New Mexico, and answer the questions that follow.

- |                     |              |                      |                |
|---------------------|--------------|----------------------|----------------|
| <b>a.</b> [temiban] | 'I went'     | <b>d.</b> [mimiaj]   | 'he was going' |
| <b>b.</b> [amiban]  | 'you went'   | <b>e.</b> [tewanban] | 'I came'       |
| <b>c.</b> [temiwe]  | 'I am going' | <b>f.</b> [tewanhi]  | 'I will come'  |

- i. List the morphemes corresponding to the following English translations.

_____ 'I'	_____ 'go'	_____ (present progressive)
_____ 'you'	_____ 'come'	_____ (past progressive)
_____ 'he'	_____ (past)	_____ (future)

- ii. What sort of affixes are the subject morphemes?

- iii. What sort of affixes are the tense morphemes?

- iv. What is the order of morphemes in Isleta?

- v. How would you say each of the following in Isleta?

- 'He went.'
- 'I will go.'
- 'You were coming.'

**37. German**

Identify all the plural morphemes and all the different morphological processes that can be involved in the pluralization of nouns in German. Don't worry about trying to describe which plural morpheme goes with which type of word. Just list the morphemes. (Note that the data below are given in normal German orthography, not IPA; vowels <ü> and <ö> are front rounded vowels and <äu> is pronounced [ɔɪ].)

<i>Singular</i>	<i>Plural</i>	<i>Gloss</i>
<b>a.</b> Bild	Bilder	'picture'
<b>b.</b> Büro	Büros	'office'
<b>c.</b> Tüte	Tüten	'bag'
<b>d.</b> Loch	Löcher	'hole'
<b>e.</b> Uhr	Uhren	'watch'
<b>f.</b> Rind	Rinder	'bull/cow'
<b>g.</b> Wagen	Wagen	'vehicle'
<b>h.</b> Stift	Stifte	'pen'
<b>i.</b> Haus	Häuser	'house'
<b>j.</b> Laus	Läuse	'louse'
<b>k.</b> Hut	Hüte	'hat'
<b>l.</b> Hütte	Hütten	'hut'
<b>m.</b> Buch	Bücher	'book'
<b>n.</b> Dach	Dächer	'roof'
<b>o.</b> Kind	Kinder	'child'

**File 4.6 Practice***Intermediate Exercises***38. Swahili**

Examine the following data from Swahili, a language spoken in East Africa, and answer the questions that follow.

- |                         |                          |                          |                            |
|-------------------------|--------------------------|--------------------------|----------------------------|
| <b>a.</b> [atanipenda]  | 's/he will like me'      | <b>o.</b> [atanipiga]    | 's/he will beat me'        |
| <b>b.</b> [atakupenda]  | 's/he will like you'     | <b>p.</b> [atakupiga]    | 's/he will beat you'       |
| <b>c.</b> [atampenda]   | 's/he will like him/her' | <b>q.</b> [atampiga]     | 's/he will beat him/her'   |
| <b>d.</b> [atatupenda]  | 's/he will like us'      | <b>r.</b> [ananipiga]    | 's/he is beating me'       |
| <b>e.</b> [atwapenda]   | 's/he will like them'    | <b>s.</b> [anakupiga]    | 's/he is beating you'      |
| <b>f.</b> [nitakupenda] | 'I will like you'        | <b>t.</b> [anampiga]     | 's/he is beating him/her'  |
| <b>g.</b> [nitampenda]  | 'I will like him/her'    | <b>u.</b> [amekupiga]    | 's/he has beaten you'      |
| <b>h.</b> [nitawapenda] | 'I will like them'       | <b>v.</b> [amenipiga]    | 's/he has beaten me'       |
| <b>i.</b> [utanipenda]  | 'you will like me'       | <b>w.</b> [amempiga]     | 's/he has beaten him/her'  |
| <b>j.</b> [utampenda]   | 'you will like him/her'  | <b>x.</b> [alinipiga]    | 's/he beat me'             |
| <b>k.</b> [utampenda]   | 'we will like him/her'   | <b>y.</b> [alikupiga]    | 's/he beat you'            |
| <b>l.</b> [watampenda]  | 'they will like him/her' | <b>z.</b> [alimpiga]     | 's/he beat him/her'        |
| <b>m.</b> [wametulipa]  | 'they have paid us'      | <b>aa.</b> [atakusumbua] | 's/he will annoy you'      |
| <b>n.</b> [tulikulipa]  | 'we paid you'            | <b>bb.</b> [unamsumbu]   | 'you are annoying him/her' |

- i. Give the Swahili morphemes corresponding to the following English translations:

_____ 'I'	_____ 'we'	_____ (past marker)
_____ 'pay'	_____ 'like'	_____ (present progressive)
_____ 's/he'	_____ 'annoy'	_____ (future marker)
_____ 'me'	_____ 'him/her'	_____ (present perfect)
_____ 'beat'	_____ 'they'	_____ 'you' (if subject)
_____ 'us'	_____ 'them'	_____ 'you' (if object)

- ii. What is the order of morphemes in Swahili (in terms of subject, object, verb, and tense)?

- iii. Give the Swahili word for the following English translations:

- 'I have beaten them.'
- 'They are beating me.'
- 'They have annoyed me.'
- 'You have beaten us.'
- 'We beat them.'
- 'I am paying him/her.'

- iv. Give the English translation for the following Swahili words.

- [atanilipa]
- [utawapiga]
- [walikupenda]
- [nimemsumbu]

**39. Cree**

Examine the following data from Cree, an Algonquian language spoken in Canada, and answer the questions that follow.

- a. [tʃimə:n] 'canoe'
- b. [nitʃimə:n] 'my canoe'
- c. [so:nja] 'money'
- d. [nisonija] 'my money'
- e. [wijas] 'meat'
- f. [niwija:s] 'my meat'
- g. [e:mihkwa:n] 'spoon'
- h. [nitemihkwa:n] 'my spoon'
- i. [astotin] 'hat'
- j. [nitastotin] 'my hat'
- k. [ospwa:kan] 'pipe'

- l. [nitospwakan] 'my pipe'
- m. [akimew] 's/he counts'
- n. [nitakimen] 'I count'
- o. [apiw] 's/he sits'
- p. [nitapin] 'I sit'
- q. [ispelohkew] 's/he rests'
- r. [nitispelohken] 'I rest'
- s. [kaakimew] 's/he will count'
- t. [nikaakimen] 'I will count'
- u. [kaapiw] 's/he will sit'
- v. [nikaapin] 'I will sit'

- i. What are the Cree morphemes for the following?

\_\_\_\_\_ 'I'  
\_\_\_\_\_ 's/he'

\_\_\_\_\_ 'my'  
(future tense)

- ii. What are the allomorphs for 'I' and 'my'?

- iii. What are the conditioning environments for the allomorphs?

- iv. How does the morpheme 'I' differ from the morpheme 'my' (with respect to form, not meaning)?

**40. Zoque**

Examine the following data from Zoque, a language spoken in Mexico, and answer the subsequent questions.

- a. [kenu] 'he looked'
- b. [sikku] 'he laughed'
- c. [wihtu] 'he walked'
- d. [ka?u] 'he died'
- e. [cihcu] 'it tore'
- f. [sohsu] 'it cooked'

- g. [kenpa] 'he looks'
- h. [sikpa] 'he laughs'
- i. [witpa] 'he walks'
- j. [ka?pa] 'he dies'
- k. [cicpa] 'it tears'
- l. [sospa] 'it cooks'

- i. What is the Zoque morpheme indicating the present tense?

- ii. For each verb, give the meaning and list the allomorphs of the stem.

- iii. Given any Zoque verb with two stem allomorphs, what morphological category determines the choice of stem? That is, how do you know which stem to use when?

- iv. Describe the relationship between the stem allomorphs in terms of phonological form.

- v. What is the Zoque morpheme meaning 'he' or 'it'?

**File 4.6 Practice****41. Serbo-Croatian**

Examine the following data from Serbo-Croatian, a Slavic language spoken in Bosnia and Herzegovina, Croatia, Montenegro, and Serbia, and answer the questions below. The data are given in standard Roman orthography.

- |              |                         |               |                          |
|--------------|-------------------------|---------------|--------------------------|
| a. svirati   | 'to play' (infinitive)  | o. kupovati   | 'to buy' (infinitive)    |
| b. diram     | 'I touch'               | p. dirati     | 'to touch' (infinitive)  |
| c. gledanje  | 'the watching'          | q. sviranje   | 'the playing'            |
| d. gledaju   | 'they watch'            | r. sviraju    | 'they play'              |
| e. stanujem  | 'I live'                | s. diraju     | 'they touch'             |
| f. stanovati | 'to live' (infinitive)  | t. nazivanje  | 'the calling'            |
| g. kupuju    | 'they buy'              | u. gladovati  | 'to starve' (infinitive) |
| h. kupujem   | 'I buy'                 | v. gladovanje | 'the starving'           |
| i. kupovanje | 'the buying'            | w. gladujem   | 'I starve'               |
| j. nazivati  | 'to call' (infinitive)  | x. gladuju    | 'they starve'            |
| k. sviram    | 'I play'                | y. diranje    | 'the touching'           |
| l. gledam    | 'I watch'               | z. stanovanje | 'the living'             |
| m. gledati   | 'to watch' (infinitive) | aa. nazivam   | 'I call'                 |
| n. stanuju   | 'they live'             | bb. nazivaju  | 'they call'              |

- i. What is the first-person singular present tense suffix?

- ii. What is the third-person plural present tense suffix?

- iii. What is the infinitival suffix?

- iv. What is the suffix that turns verbal stems into deverbal nouns like *the living* or *the calling*?

- v. Some verbal stems above have exactly the same form regardless of which suffix is added to them (e.g. *sviram*, *sviraju*, *svirati*, *sviranje*), while other verbal stems have one form when you add the first- or third-person present tense suffix to it, and a different form if it occurs with the infinitive or the noun-forming suffix (e.g. *kupujem*, *kupuju* vs. *kupovati*, *kupovanje*). If you look at the infinitive form of a verb in Serbo-Croatian, how can you tell whether the stem will stay the same or change when combined with the first- or third-person present tense suffix? Describe as precisely as you can how the form of these stems changes.

- vi. Given the answers you came up with for (i-v), fill in the blanks below.

- |          |                       |           |                           |
|----------|-----------------------|-----------|---------------------------|
| darovati | 'to give a present'   | darujem   | 'I give a present'        |
| _____    | 'they give a present' | _____     | 'the giving of a present' |
| razaram  | 'I destroy'           | _____     | 'they destroy'            |
| _____    | 'to destroy'          | razaranje | 'the destruction'         |
| stvarati | 'to create'           | _____     | 'I create'                |
| _____    | 'they create'         | _____     | 'the creation'            |
| ratuju   | 'they wage war'       | _____     | 'the waging of a war'     |
| _____    | 'to wage war'         | _____     | 'I wage war'              |

**42. Hanunoo**

Hanunoo is a language spoken in the Philippine Islands. Compare the data from this language horizontally (e.g., (a)-(h)-(o) go together), and answer the questions that follow.

a. [?usa]	'one'	b. [duwa]	'two'	c. [tulu]	'three'	d. [?upat]	'four'	e. [lima]	'five'	f. [?unum]	'six'	g. [pitu]	'seven'	h. [kas?a]	'once'	i. [kadwa]	'twice'	j. [katlu]	'three times'	k. [kap?at]	'four times'	l. [kalima]	'five times'	m. [kan?um]	'six times'	n. [kapitu]	'seven times'	o. [?usahi]	'make it one'	p. [duwahi]	'make it two'	q. [tuluhi]	'make it three'	r. [?upati]	'make it four'	s. [limahi]	'make it five'	t. [?unumi]	'make it six'	u. [pituhi]	'make it seven'
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- Two affixes are illustrated in these data. Identify each of them, state what kind of affix each one is, and tell what information or change is associated with each affix.
- Considering the horizontal sets of words, describe the phonological alternations in the stems in each set. (If you have already completed the phonology files, use the relevant terms for phonological processes in your descriptions.)

**Advanced Exercises****43. Hungarian**

Examine the Hungarian data below and answer the questions that follow. Note that [y] represents a high front rounded vowel.

	Singular	Plural
a. 'table'	[?ost?l]	[?ost?lok]
b. 'worker'	[munka:f]	[munka:fok]
c. 'man'	[ember]	[emberek]
d. 'white'	[feher]	[feherrek]
e. 'this'	[ez]	[ezek]
f. 'line'	[for]	[forok]
g. 'eyeglasses'	[semyveg]	[semyvegek]
h. 'shirt'	[inj]	[injek]
i. 'head'	[fey]	[feyek]
j. 'box'	[doboz]	[dobozok]
k. 'drum'	[dob]	[dobok]
l. 'age'	[kor]	[korok]
m. 'coat'	[kobait]	[kobartok]
n. 'flower'	[vira:g]	[vira:gok]

- What are the allomorphs of the Hungarian plural marker?
- State the conditioning environment for each allomorph.

**44. Popoluca**

Examine the following data from Popoluca, a language spoken in Mexico, and answer the questions that follow. (Note: 'you' is singular throughout this exercise.)

a. [?in]ku?tpa]	'you eat it'	f. [?ampetpa]	'I sweep it'
b. [?anhokspa]	'I hoe it'	g. [?impet]	'you swept it'
c. [?iku?t]	'he ate it'	h. [?antek]	'my house'
d. [?imo:ja]	'his flower'	i. [?inhokspa]	'you hoe it'
e. [mo:ja]	'flower'	j. [no:mi]	'boss'

(cont.)

**File 4.6 Practice**

k. [?ano:mi]	'my boss'	n. [?amo:ja]	'my flower'
l. [?ika:ma]	'his cornfield'	o. [?ino:mi]	'your boss'
m. [?in]ka:ma]	'your cornfield'		

- List all of the Popoluca allomorphs corresponding to the following translations:

_____	'cornfield'	_____	(past tense)
_____	'flower'	_____	(present tense)
_____	'boss'	_____	'I/my'
_____	'house'	_____	'you/your'
_____	'eat'	_____	'he/his'
_____	'sweep'	_____	'hoe'

- For those morphemes with more than one allomorph, state the phonetic environments that determine the occurrence of each allomorph.

**45. Mongolian**

Examine the following Mongolian data. Note that [y] represents a high front rounded vowel, [ø] represents a mid front rounded vowel, and [x] represents a voiceless velar fricative.

	Stem	Future Imperative
a. 'enter'	[or-]	[oro:roi]
b. 'go'	[jav]	[javarrai]
c. 'sit'	[su:-]	[surgarai]
d. 'come'	[ir-]	[ire:rei]
e. 'do'	[xi:-]	[xi:ge:rei]
f. 'come out'	[gar-]	[gara:rar]
g. 'take'	[av-]	[ava:rar]
h. 'study'	[sur-]	[sura:rai]
i. 'finish'	[byte:-]	[byte:gerrei]
j. 'drink'	[y:-]	[ygør:rø]
k. 'find out'	[ol-]	[olo:roi]
l. 'conquer'	[jal-]	[jalaxrai]
m. 'ask'	[asu:-]	[asurga:rai]
n. 'finish'	[tøgsg-]	[tøgsgør:rø]
o. 'beat'	[dev-]	[deverrei]
p. 'give'	[øg-]	[øgør:rø]
q. 'say'	[xel-]	[xelerrei]
r. 'meet'	[u:lz-]	[u:lza:rai]
s. 'become'	[bol-]	[bolot:roi]
t. 'write'	[bitf-]	[bitfe:rei]
u. 'develop'	[xøgdʒ-]	[xøgdžør:rø]

- List all of the allomorphs of the Mongolian future imperative marker.
- What environments condition the appearance of the different allomorphs?

**46. Japanese**

Consider the following inflected Japanese verb forms and answer the questions that follow. (X, Y, and Z are used as "dummy" pronouns in the glosses—they are not actually expressed morphologically in the data.)

a. [tabeta]	'X ate Y'
b. [aketa]	'X opened Y'

(cont.)

- c. [tabesaseta] 'X made Y eat Z'
- d. [akesaseta] 'X made Y open Z'
- e. [taberareta] 'X was eaten'
- f. [akerareta] 'X was opened'
- g. [tabesaserreta] 'X was made to eat Y'
- h. [akesaserreta] 'X was made to open Y'
- i. [tabesasenai] 'X doesn't/won't make Y eat Z'
- j. [tabenai] 'X doesn't/won't eat Y'
- k. [tabesaserareru] 'X is/will be made to eat Y'

i. Give the Japanese morphemes for the following English translations:

- 'open'
- 'eat'
- passive marker ('... be VERB-ed,' e.g., 'They were opened/eaten')
- causative marker ('... make X VERB,' e.g., 'Robin makes Tracey laugh')
- nonpast marker (present or future tense)
- past marker
- negative marker

ii. Suppose a Japanese verb form were to include the following sets of morphemes. For each set, indicate the order in which the morphemes would occur in a verb form.

- passive, root, past, causative
- causative, nonpast, root
- root, negative, causative

iii. Give the Japanese verb form that would be used for each of the following English translations. Remember that you don't need to worry about words like *she*, *him*, and *them*.

- '(She) will make (him) open (them).'
- '(He) will be made to open (them).'

iv. In Japanese, [uketa] means '(She) took (a test).' Using this fact along with what you've observed above, how would you say the following in Japanese? Again, don't try to translate the items in parentheses.

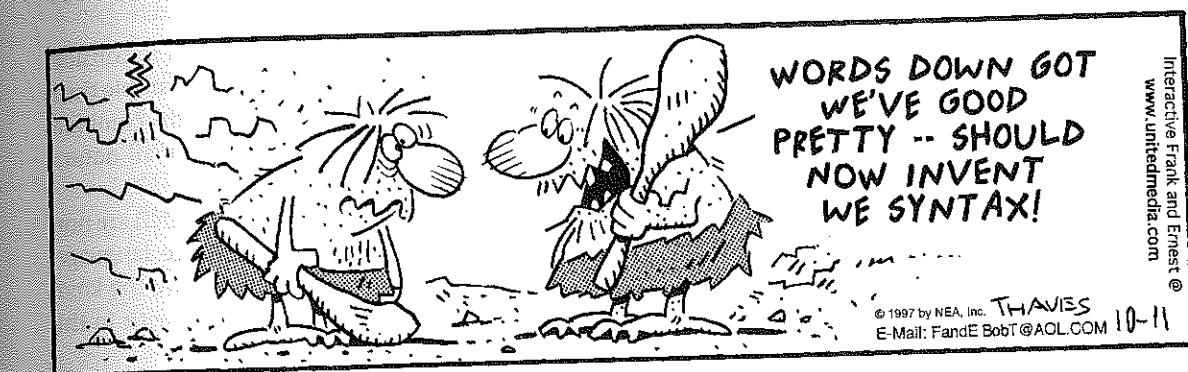
- '(She) was made to take (a test).'
- '(She) makes (him) take (a test).'
- '(She) will not take (a test).'

#### Further Readings

- Aronoff, M., and K. Fudeman. (2010). *What is morphology?* New York: John Wiley and Sons.  
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# CHAPTER 5

## Syntax



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