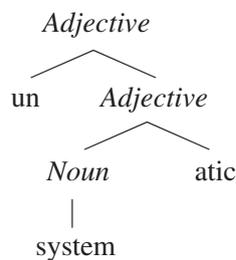


FIGURE 2.1 | Classification of English morphemes.

## The Hierarchical Structure of Words

We saw earlier that morphemes are added in a fixed order. This order reflects the *hierarchical structure* of the word. A word is not a simple sequence of morphemes. It has an internal structure. For example, the word *unsystematic* is composed of three morphemes: *un-*, *system*, and *-atic*. The root is *system*, a noun, to which we add the suffix *-atic*, resulting in an adjective, *systematic*. To this adjective, we add the prefix *un-*, forming a new adjective, *unsystematic*.

In order to represent the hierarchical organization of words (and sentences), linguists use **tree diagrams**. The tree diagram for *unsystematic* is as follows:



This tree represents the application of two morphological rules:

1. Noun + atic → Adjective
2. un + Adjective → Adjective

Rule 1 attaches the derivational suffix *-atic* to the root noun, forming an adjective. Rule 2 takes the adjective formed by rule 1 and attaches the derivational prefix *un-*. The diagram shows that the entire word—*unsystematic*—is an adjective that is composed of an adjective—*systematic*—plus *un*. The adjective is itself composed of a noun—*system*—plus the suffix *-atic*.

Hierarchical structure is an essential property of human language. Words (and sentences) have component parts, which relate to each other in specific, rule-governed ways. Although at first glance it may seem that, aside from order, the morphemes *un-* and *-atic* each relate to the root *system* in the same way, this is not the case. The root *system* is “closer” to *-atic* than it is to *un-*, and *un-* is actually connected to the adjective *systematic*, and not directly to *system*. Indeed, *\*unsystem* is not a word.

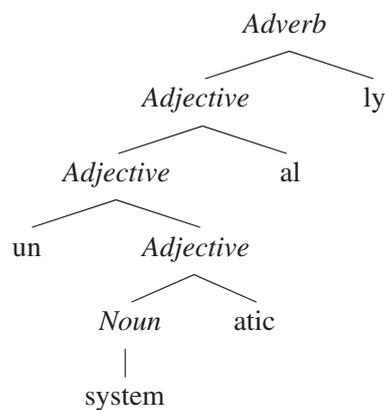
Further morphological rules can be applied to the given structure. For example, English has a derivational suffix *-al*, as in *egotistical*, *fantastical*, and *astronomical*. In these cases, *-al* is added to an adjective—*egotistic*, *fantastic*, *astronomic*—to form a new adjective. The rule for *-al* is as follows:

3. Adjective + al → Adjective

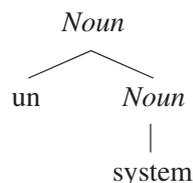
Another affix is *-ly*, which is added to adjectives—*happy*, *lazy*, *hopeful*—to form adverbs *happily*, *lazily*, *hopefully*. Following is the rule for *-ly*:

4. Adjective + ly → Adverb

Applying these two rules to the derived form *unsystematic*, we get the following tree for *unsystematically*:



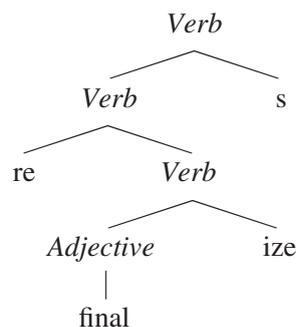
This is a rather complex word. Despite its complexity, it is well-formed because it follows the morphological rules of the language. On the other hand, a very simple word can be ungrammatical. Suppose in the above example we first added *un-* to the root *system*. That would have resulted in the nonword *\*unsystem*.



\**Unsystem* is not a possible word because the rule of English that allows *un-* to be added to nouns is restricted to very few cases, and those always nouns that already have a suffix such as *un + employment*, *un + acceptance* or *un + feasibility*. The large soft-drink company whose ad campaign promoted the *Uncola* successfully flouted this linguistic rule to capture people's attention. Part of our linguistic competence includes the ability to recognize possible versus impossible words, like \**unsystem* and \**Uncola*. Possible words are those that conform to the rules; impossible words are those that do not.

Tree diagrams make explicit the way speakers represent the internal structure of the morphologically complex words in their language. In speaking and writing, we appear to string morphemes together sequentially as in *un + system + atic*. However, our mental representation of words is hierarchical as well as linear, and this is shown by tree diagrams.

Inflectional morphemes are equally well represented. The following tree shows that the inflectional agreement morpheme *-s* follows the derivational morphemes *-ize* and *re-* in *refinalizes*:



The tree also shows that *re-* applies to *finalize*, which is correct as \**refinal* is not a word, and that the inflectional morpheme follows the derivational morpheme.

The hierarchical organization of words is even more clearly shown by structurally ambiguous words, words that have more than one meaning by virtue of having more than one structure. Consider the word *unlockable*. Imagine you are inside a room and you want some privacy. You would be unhappy to find the door is *unlockable*—‘not able to be locked.’ Now imagine you are inside a locked room trying to get out. You would be very relieved to find that the door is *unlockable*—‘able to be unlocked.’ These two meanings correspond to two different structures, as follows:

