### Abbreviations

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ps  past subordinate
qm  question marker
recip reciprocal
redup reduplicative
refl reflexive
rel relativizer
res resultative
sg  singular
stat stative
sub subject
subord subordinating morph
tri trial
v, V verb; vowel; theme vowel
1.1 An Introduction to Morphology and Morphological Analysis

1.1.1 The morphology of everyday life

Let’s start with some morphological facts of everyday life. If you had been walking down the street in Ithaca, New York a few years ago, you might have looked up and seen a sign for the music store “Rebop,” a name that owes its inspiration to the jazz term rebop. Rebop was originally one of the many nonsense syllables that jazz musicians threw into their vocal improvisations, starting in the early 1920’s. In the 1940’s, rebop became interchangeable with bebop, a term of similar origin, as the term for the rhythmically and harmonically eccentric music played by young black musicians. By the 1950’s the name of this musical style was quite firmly established as simply bop. Today, the original use of rebop is known only to cognoscenti, so that most people who pass by the store will be likely to interpret the word as composed of the word bop and the prefix re-, which means approximately ‘again’. This prefix can attach only to verbs, so we must interpret bop as a verb here. Rebop must therefore mean ‘bop again’, if it means anything at all. And this music store, appropriately, specialized in selling used CDs. There’s something going on here with English morphology. Of course, rebop is not a perfectly well-formed English word. The verb bop means something like ‘bounce’, but the prefix re- normally attaches only to a verb whose meaning denotes an accomplishment. The verb rebop therefore makes little sense. But names of stores and products are designed to catch the consumer’s attention, not necessarily to make sense, and this one does so by exploiting people’s knowledge of English in a fairly complex way and breaking the rules so as to attract attention, as verbal art often does.

Consider now the following phrases, taken from a Toni Braxton song:
(1) Unbreak my heart
Uncry these tears

We have never seen anyone unbreak something, and you certainly can’t uncry tears. But every English speaker can understand these words. We all know what it means to unbreak somebody’s heart or to wish that one’s heart were unbroken. If we asked somebody, “unbreak my heart,” we would be asking them to reverse the process of having our heart broken. We can visualize “uncry these tears,” too — we just think of a film running backwards. We can understand these words because we know the meaning of un-, which basically reverses or undoes an action. The fact that these particular actions, breaking a heart and crying tears, cannot be reversed only adds poignancy to the song.

All human beings have this capacity for generating and understanding novel words. Sometimes someone will create an entirely new word, as J.R.R. Tolkien did when he coined the word orc. But more often than not, we build new words from preexisting pieces, as with unbreak and uncry. A more complex example of this type is bambification, defined by Douglas Coupland as “the mental conversion of flesh and blood living creatures into cartoon characters possessing bourgeois Judeo-Christian attitudes and morals.” We could easily go on to create more words on this pattern; we could talk about the Mickey-Mousification of politics, for example.

Novel words are all around us. Jerry Seinfeld has talked about about the shushers, the shushees, and the unshushables in a movie theater. Morley Safer was dubbed quirkologist—expert on quirky people—on a special episode of 60 Minutes. For those who hate buffets, the TV character Frasier Crane came up with the term smorgsaphobia. Finally, the longest novel morphologically complex word we have been able to find in the daily press is deinstitutionalization, from the New York Times.
These are everyday morphological facts, the kind you run across every day as a literate speaker of English. What these words — rebop, unbreak, uncry, bambification, quirkologist, smorgsaphobia, deinstitutionalization — have in common is their newness. When we see or hear them, they leap out at us, for the simple reason that we have probably never seen or heard them before. It is interesting that novel words do this to us, because novel sentences do not. When you hear a new sentence, you generally don’t realize that this is the first time that you’ve heard it — unless, perhaps, it’s the first time you hear Noam Chomsky’s “Colorless green ideas sleep furiously.” And you don’t say to yourself, “What a remarkable sentence,” unless it happens to be one from Proust or Joyce or some other verbal artist. That morphology differs from syntax in this way is an observation that many people have made, going back at least to Otto Jespersen.

Now let’s move to some slightly more abstract complex morphological facts. These are the kind of morphological facts that you don’t notice every day. They are so embedded in your language that you don’t even think about them. They are more common than the ones we have just looked at, but at the same time deeper and more complex.

If you speak English and are concerned about your health, you might say:

(2) I eat one melon a day.

Let’s imagine that we are even more concerned about our health than you are. We don’t just eat one melon a day, rather:

(3) We eat two melons a day.

It is fact about English that we cannot say:

(4) *We eat two melon a day.
However, if we were speaking Indonesian or Japanese, we would say the equivalent of *two melon* (*three melon, four melon*, etc.) because these languages don’t use morphological plurals in sentences like this.

\[(5)\] Indonesian:

Saiga makan dua buah semangka (se) tiap hari

I eat two fruit melon every day

‘I eat two melons every day.’

Japanese:

mainichi futatsu-no meron-o tabemasu
every day two-GEN melon-OBJ eat.IMPERF

‘I eat two melons every day.’

The morphological grammar of English tells us that we have to put an *-s* on *melon* whenever we are talking about more than one. This fact of English is so transparent that native speakers don’t notice it. If we happen to be speakers of language without obligatory plural marking, however, we will notice it because we are going to have a lot of trouble with it.

We have now observed something about English morphology. If a word is plural, it takes the suffix *-s*. Suppose we don’t just eat melons, however. We eat other things too. In fact,

\[(6)\] We eat two melons, three fish, and four children a day.

Everyone agrees that *fish* is plural, but there is no plural marker. *Children* is also plural, but it has a very unusual plural suffix, *-ren*, plus an internal change: we say [tʃild-] instead of [tʃajld]. In other words, it’s not always the case that we mark plural...
words with an s-like thing; there are other ways in which we can mark plurals. And that is something you have to know if you know English.

Consider the following:

(7) Today they **claim** that they will fix the clock tower by Friday, but yesterday they **claimed** that it would take at least a month.

When we are talking about today, we use one form of the verb, but when we’re talking about yesterday we use another. Again, this is not true for all languages. If we were speaking Vietnamese, for example, we wouldn’t make any distinction between *claim* and *claimed* — we wouldn’t mark the verb at all. If we were speaking Chinese, we would not distinguish between *claim* and *claimed* in a sentence like this, because the adverb *zuótiān* ‘yesterday’ is sufficient to indicate past tense:

(8) jíntiān tāmen shuō tāmen xǐngqǐ wū kě yī xiū hǎo zhōnglóu,
    today they say they Friday can fix well clock.tower
kě shì zuótiān tāmen què shuō zhī shǎo xū yào yíge yuè
    but yesterday they however say at least need a month
    ‘Today they claim that they will fix the clock tower by Friday, but yesterday they claimed that it would take at least a month.’

If we were to leave out *zuótiān* ‘yesterday’, we would need to use the particle *le* after the verb to show that the action took place in the past. In other words, whether or not a speaker must indicate past tense in Chinese depends on context.

Notice what happens in English when we use some other verbs besides *claim*:

(9) Today they **say** . . . but yesterday they **said** . . .

*tell us*                      *told us*
*know*                        *knew*
That these verbs and others do not simply add -t, -d, or -'d to make their past tense is an elementary fact about English morphology. We’ll talk more about verbs like these later in the chapter.

The next observation about English morphology has to do with pronouns. Imagine that the following exchange took place between two six-year olds:

(10) Who farted?
   Me.

In this context, a six-year-old would never respond with the subject pronoun *I*. But if he were to answer with a sentence, the response would be *I did*, not *Me did*. In that case, the object form of the pronoun would be ungrammatical. Without formally knowing anything at all about subjects and objects, English-speaking six-year-olds (and children even younger) master the pronoun system of their language.

Given the following sentence, how many children does Joan have?

(11) All of Joan’s children are brilliant and play musical instruments surpassingly well.

From this statement you cannot know how many children Joan has, but one thing is certain: she has more than two. If Joan had only two children, we would normally say *both her children* because it is a fact about English that there is a morphological distinction among universal quantifiers between the one designating all of two (*both*) or more than two (*all*) of a particular type of entity. In some other languages, marking for dual is even more pervasive. This is the case in Ancient Greek, as shown by the following examples:

(12) ho stratiō:tes lambánei tous híppous
    the.NOM.SG soldier.NOM.SG take.3SG the.ACC.PL horses.ACC.PL

‘The soldier takes the horses.’
‘The two soldiers take the horses.’

‘The soldiers (three or more) take the horses.’

While English does not have special affixes to mark the dual, it keeps track of the distinction through words like *all* and *both*. There are actually languages in the world like Manam (Papua New Guinea; Gregersen 1976) and Larike (Central Maluku, Indonesia; Laidig and Laidig 1990) that do not only distinguish singular, dual, and plural, but trial as well. The use of singular, dual, trial, and plural second person subject prefixes in Larike is illustrated below:

(13)  
\[
\text{Ai-} \quad \text{rala} \quad \text{iter-} \quad \text{lawa} \quad \text{pe?a-?o} \quad ?
\]

2SG.SUB- chop.down 1PL.INCL.SUB- garden finish- QM

‘Did you (sg.) finish clearing our garden?’


if 1SG.SUB- eat 2DU certainly 2DU.SUB- eat also

‘If I eat, certainly you both will eat too.’


if 2TRI.SUB- NEG- go 1SG.SUB-IRR- go.home

‘If you three don’t want to go, I’m going home.’
1.1.2 What is morphology?

Let’s move now to some generalizations that have been made about the morphologies of various languages, some of which you may have heard before. As far as we know, these statements are largely true:

(14) Vietnamese has no morphologically complex words.²

Every Greek verb has about 400 forms.

Every Navajo verb has about 2,000 forms.

Every Turkish verb has about 10,000 forms.

Every Greenlandic Eskimo verb has an infinite number of forms.

These statements show how diverse languages are in their morphological complexity.

These are the kinds of facts that we deal with when we talk about morphology. But what is morphology? The term is generally attributed to Goethe, who coined it early in the nineteenth century, but in a biological context. Its etymology is clearly Greek: *morph-* means ‘shape, form’, and so *morphology* is the study of form or forms. While the term is used in biology to refer to the study of the form and structure of organisms and in geology to refer to the study of the configuration and evolution of land forms, its linguistic use has to do with the internal structure of grammatically complex words.

The philosopher Saul Kripke observed that most words in everyday use carry with them a historical baggage. For this reason we cannot give a precise definition of
morphology (or for that matter, any other pretheoretical term). In a sense, when we use a word like *morphology*, we carry with us the entire history of our use of the word, plus other people’s use of it over a long period of time. The only way for a word to get a simple, single definition is as a technical term within a theory. Since we are not really interested in technical terms within theories for the moment, we cannot give you a more solid definition, though we will certainly flesh out our definition as we go on.

In other branches of linguistics, such as syntax or phonology, the term *morphology* takes on special meanings. When formal syntacticians working within the generative tradition have reason to refer to morphology, for example, they are usually concerned with hypothesized abstract morphosyntactic elements that are believed to be present in the syntax and interpreted by the morphology. What the morphology does with these hypothetical abstract elements is not the business of the syntactician. For example, it is inconsequential to a syntactician that the abstract morphosyntactic feature PAST corresponds to a suffix -d in the word *prepared*, but not in the word *ate*. Turning now to phonology, most phonologists will be able to tell you about words like *prepared, jumped, and calculated*, but will not have much to say about words like *ate or knew*. Why not? Because for a phonologist, forms like *prepared* are morphologically complex and clearly contain two elements, which we call *morphs* or *morphemes*, but *ate* contains only one element. From their point of view, it is morphologically simplex. Notice that for a syntactician, these two words are morphologically complex in exactly the same way. They are both past tenses of English verbs, and their abstract syntactic structure, whatever it is, will be the same. For a phonologist, they are two very different animals.
In short, morphology is like the proverbial elephant. What it is depends on your point of view. If you’re interested in syntax, it’s one thing. If you’re interested in phonology, it’s another. And if you’re interested in lexical processing, it’s still another. This book is a general introduction to morphology and morphological analysis from the point of view of a morphologist. The purpose is not to advocate any particular theory or to give the truth (whatever that is), but rather to get you, the reader, to where you can look for it by yourself.

1.1.3 Prejudices and Principles

It is inevitable that some of our remarks will be colored by our own beliefs and background. We would therefore like to present what we believe to be our prejudices about linguistics and linguistic methodology.

First, we believe that languages differ from one another. You might be thinking, “Of course they do!” But we mean this in a very special way. Some linguists are always looking for ways that languages are similar, and at times, we do that, too. But we believe that if you focus only on the similarities between languages, you miss out on all of the exciting ways in which they differ. What’s more, you may find parallels and similarities where none really exist. We try to approach linguistic analysis with as open a mind as possible, and to do this, it is first necessary to appreciate the uniqueness and diversity of the world’s languages.

Our second prejudice is that languages, which we can write with a small $l$, are different from Language, with a capital $L$. There are thousands of individual languages in the world. But we may also speak of language in general to mean the general phenomenon of Language that encompasses all individual languages. There is an important distinction between these two uses of the word language and each is
equally important to linguistics. Individual languages have properties that Language does not have. To tie this prejudice in with the preceding one, we strongly believe that morphological theory and morphological analysis must be grounded in morphological description. If we want to appreciate what morphology really is, it’s best to have some idea of what the morphology of individual languages is like.

Our next belief is that morphology is a distinct component of languages or grammars. If you are not already familiar with some of the controversy surrounding morphology, this prejudice needs an explanation. The fact that some languages have no morphologically complex words has led some people to conclude that morphology is not part of linguistics. The reasoning is that if linguistics is concerned with properties of all languages, and if there are languages that don’t have this particular property, then morphology is not a property of all languages, and linguists don’t have to worry about it. It has been shown elsewhere (Aronoff 1994), however, that there are aspects of morphology which cannot be attributed to the syntax or the phonology, or anything else. We’ll examine some of these aspects in later chapters.

Our next prejudice is that morphologies are systems. This is a very old observation. Because of it, it is impossible to talk about isolated facts in a language — everything holds together. This prejudice together with the second one, above, are the reasons why we’ll be looking carefully at the morphology of a particular language, Kujamaat Jóola, throughout this book. Considering the morphology of Kujamaat Jóola in close to its entirety will give us a valuable perspective that we would never gain if we only focused on isolated facts from several languages.

So far, we have given you our prejudices about the nature of language and morphology. We also have some methodological prejudices. The first is to take an attitude of skeptical realism. Albert Einstein said that a physicist must be both a
realist and a nominalist, a realist in the sense that you must believe that what you
ultimately find will be real, but a nominalist in the sense that you must never believe
that you’ve found what you’re looking for. Martin Joos made a similar statement
about linguistics. On the one hand, you should always believe that what you are
looking for is God’s truth, but on the other, you should believe that all you have found
so far is hocus-pocus. We believe strongly in the value of having a linguistic theory,
but we believe equally strongly that you should never trust it completely.

Our other methodological prejudice can be summed up as “Anything goes.”
We take a no-holds-barred approach to linguistics. We’ll use any tool or method that
will tell us how language works. This attitude stems in part from our skepticism about
theories. People who are wedded to individual theories tend to believe in using tools
that are theory-based. Our tools are not theory-based. If a tool does the job, we are
happy to use it, whether it is a traditional linguistic tool, an experimental tool, or a
statistical tool. We are interested in language and languages. And fundamentally, that
is what we want to know about.

There are two complementary approaches to morphology. The linguist needs
both — you can’t use just one. The analytic approach, from a purely parochial
morphological point of view, has to do with breaking words down. The goal is to look
for the smallest pieces that retain a grammatical function. If we take the English word
representation, we can break it up into three morphemes: re-, present, and -ation.
Present is the stem of the word, re- is a prefix, and -ation is a suffix. Prefixes and
suffixes are both types of affixes.

This notion of morphological analysis is usually associated with American
structuralist linguistics. There is a good reason for this. The structuralists were often
dealing with languages that they had never encountered before and about which they
had no preconceived notions. It was therefore crucial that they have very explicit methods of linguistic analysis. No matter what language we’re looking at, we need analytic methods that will be independent of the structures we are examining; preconceived notions might interfere with an objective, scientific analysis. This is especially true when dealing with unfamiliar languages.

The second approach to morphology is more often associated with theory than with methodology, perhaps unfairly. This is the synthetic approach. It basically says, “I have a lot of little pieces here. How do I put them together?” This question presupposes that you already know what the pieces are. So in a sense, analysis in some way must precede synthesis.

Say that you’ve broken a clock and taken it apart, and now you have to put all the little pieces back together. There’s a catch: you don’t know how. You could always go by trial and error. But the most efficient way would be to have some theory of how the clock goes together. Synthesis really involves theory construction.

From a morphological point of view, the synthetic question you ask is, “How do I produce a grammatically complex word?” This already assumes that you know what you are making it out of. We think that one of the real problems of a morphological theory is that we don’t always have a good idea of what the pieces are. Syntacticians can supply us with tools: case and number, for example, are ancient syntactic notions that we can use in our morphology. And if we have a good morphological theory, it will help us to account for the syntax. It’s really a two-way street.

Constructing a theory of morphology without knowing what the pieces are is much like smashing the clock instead of taking it apart in a reasonable fashion, and then trying to put it back together. You can’t tell how the clock works unless you’ve
been given a theory by God or by the Swiss watchmaker who gave you the clock. Since morphologists are scientists, we can’t rely on God or Swiss watchmakers to tell us anything, and so the only way we can really find anything out is by pulling words apart carefully, taking great care to note where each piece came from to begin with.

Before we encounter any actual problems, we would like to give you some analytical principles used in morphology. The principles are fairly simple, and there aren’t that many. These are taken from Eugene Nida’s (1949; revised edition 1965) textbook *Morphology.*

The first principle is given in (21):

(21) Principle 1

Forms with the same meaning and the same sound shape in all their occurrences are instances of the same sign.

Step one in morphological analysis is to look for elements that have the same form and the same meaning. This is the basic type-token problem. Let’s say that we have a bunch of coins. Each is a token, a form. If we look at them carefully, we see that three of them look very much the same (they are all nickels), and two of them are identical — they both say 1997. These are tokens of the same type: they have identical forms and identical meanings.

To apply this to words, consider the Spanish words *buenísimo* ‘very good’ (< *bueno* ‘good’), *ricísimo* ‘very delicious’ (< *rico* ‘delicious*’), and *utilísimo* ‘very useful’ (< *útil* ‘useful*’). In each case, the suffix –*ísimo* contributes the same superlative meaning, and it has the same shape. We logically conclude that the suffix is the same for all three words.

But this isn’t the whole story, as Principle 2 tells us:

(22) Principle 2
Forms with the same meaning but different sound shapes may be instances of the same sign if their distributions do not overlap.

In Kujamaat Jóola, for example, the stem /baj-/ has two possible shapes, [baj-] and [b´j-], but their distributions don’t overlap. [baj-] occurs in the presence of a morph with an underlyingly tense vowel, but [baj-] does not. When two or more instances of a given sign occur with different shapes, we call them allomorphs, or variants.

The regular plural marker in English has several allomorphs — voiceless alveolar fricative /s/, voiced alveolar fricative /z/, schwa plus voiced alveolar fricative /z/, syllablic alveolar nasal /n/, and Ø — as shown in (23):

(23) shade-/z/  
    seat-/s/  
    hedg-/ɔz/  
    ox-/n/  
    fish-Ø

As in the previous example, the distributions of these signs do not overlap, and they all have the same meaning. We can infer that they are instances of the same sign.

(24) Principle 3  

Not all signs are segmental.

Normally, when we think of linguistic signs, we think of forms that can be pronounced in some sense, e.g. *chicken, the, un-, -ize*. But some linguistic signs can’t be pronounced on their own. They are dependent on other signs. In English, for example, vowel alternations may serve to differentiate present and past forms of the verb (25). We refer to these alternations as ablaut:

(25) run ran  
    speak spoke
We know that there is a past tense marker distinguishing the words in the second column from those in the first. But what is it? It is not the /æ/ of *ran* or the /ʊ/ of *spoke*. In fact, it is not segmental at all. We must look at both the present and past tense forms of these verbs, because it is the contrast between them that is important.

This observation leads into the final principle that we present here:

(26) Principle 4

A sign may have zero as one of its variants provided it has a non-zero allomorph.

*Fish* is an example of a word with a zero plural: one fish, two fish-∅. We can say that it has a zero plural because other words, like *frogs*, have non-zero plurals. This is an analytic procedure, not a theoretical point. We cannot posit a zero unless it contrasts with some non-zero sign. In Japanese, where *sakana* means both ‘fish (sg)’ and ‘fish (pl)’, we cannot posit a zero plural (*sakana-∅*) because in Japanese, -∅[PL] doesn’t contrast with a non-zero allomorph.

As you make your way through the rest of this book, keep these principles in mind, particularly as you work on the exercises.
1.2 Introduction to Kujamaat Jóola

The Kujamaat Jóola people (who call themselves Kujamaat and their language Kujamutay) live in the Basse-Casamance region of Senegal. Their language is a cluster of dialects, of which Kujamaat, sometimes called Foñy, and Kasa are the most important. The total number of speakers in 1998 was about 186,000 (Grimes 2002). Kujamaat Jóola belongs to the Atlantic (sometimes called West Atlantic) language family, of which the best known languages are Wolof, the national language of Senegal, and Fula. Historically, the Atlantic languages are a branch of the most widespread language family in Africa, Niger-Congo, which is also one of the largest language families in the world. Kujamaat Jóola has a number of features — most particularly its intricate system of noun classes and agreement — which are remarkably similar to those of the distantly related but much larger and better known subfamily of Niger-Congo, the Bantu languages.

The most pervasive and characteristic morphological features of Kujamaat Jóola are (i) a simple and elegant vowel harmony system, (ii) an extensive noun class or gender system, (iii) rich agreement morphology, and (iv) agglutinative verbal morphology. Over the course of this book we will be exploring these and other topics in Kujamaat Jóola morphology as they relate to issues raised in individual chapters.

A general theme that will run through the book is that certain languages have lots of what we call unmotivated morphology. One of the most interesting aspects of morphology is the extent to which languages have it, though they don’t need it. We can think of morphology as a disease. A few languages escape it entirely; others have minor cases of the disease; others, like Kujamaat Jóola, have a fairly severe case of
morphology, which is one of the major reasons for our selection of this language as an example. Kujamaat Jóola has the added advantage that its morphology, though complex and sometimes unusual (as all good morphologies are), is highly regular, which makes it an excellent teaching vehicle. The morphology is also spread out across nouns, verbs, and adjectives. The inflection, especially, includes some of the most common types that one is likely to find: nominal gender, agreement, and verbal tense and aspect. Finally, there is J. David Sapir’s superb grammar, from which almost all of the Kujamaat Jóola data in this book is drawn, which provides a wonderfully lucid description of the language and especially of the morphology. The grammar has also stood the test of time: it speaks to us as clearly today as it did when it was written over thirty years ago.

Of all the distinct aspects of language, morphology is the most deeply entwined with others. There is simply no way to talk about morphology without also talking about phonology, syntax, semantics, and pragmatics. Phonology is especially important, for there is no way to get at the morphology of a language without first stripping away the effects of phonology on the forms of words. For that reason our introduction to Kujamaat Jóola phonology must be preceded by a brief overview of its phonology. Treatment of Kujamaat Jóola vowel harmony can be found in chapter 3.

The phonemic inventory of Kujamaat Jóola is given in (1). Kujamaat Jóola has a set of voiceless and voiced stops in three places of articulation — bilabial, alveolar, and velar — and nasal consonants in four — bilabial, alveolar, palatal, and velar. It has voiceless and voiced postalveolar affricates /tʃ/ and /dʒ/, transcribed here as <c> and <j> (following Sapir 1965), voiceless labiodental and alveolar fricatives /f/ and /s/, two liquids /l/ and /r/, and labiovelar and palatal glides /w/ and /y/. Vowels occur in tense-lax
pairs and may be short or long; what Sapir represents as schwa is realized as “…a tense unrounded high-mid central vowel…” under stress (Sapir 1965: 6), and is the tense counterpart to /a/. Tense variants of the high vowels are underscored:

(1) Consonants

<table>
<thead>
<tr>
<th>Consonants</th>
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<tbody>
<tr>
<td>p t k</td>
</tr>
<tr>
<td>b d g</td>
</tr>
<tr>
<td>m n n</td>
</tr>
<tr>
<td>c j</td>
</tr>
<tr>
<td>f s</td>
</tr>
<tr>
<td>l</td>
</tr>
<tr>
<td>r</td>
</tr>
<tr>
<td>(w) y (w)</td>
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</tbody>
</table>

Vowels (long and short)

<table>
<thead>
<tr>
<th>Vowels</th>
</tr>
</thead>
<tbody>
<tr>
<td>i i u u</td>
</tr>
<tr>
<td>e ø o</td>
</tr>
<tr>
<td>ε ø</td>
</tr>
<tr>
<td>a</td>
</tr>
</tbody>
</table>

Kujamaat Jóola words showing all of the vowels are listed in (2):
(2)  

bəsîkən  ‘mortar’
ksı:t  ‘feather’
gis  ‘tear’
i:s  ‘show’
ebe  ‘cow’
-fe:giɾ  ‘three’
ɛfɛl  ‘to untie’
ɛfe:l  ‘to annoy’
ekəl  ‘type of antelope’
ekə:l  ‘to be partially ripe’
kafa:le:n  ‘to continue’
ɛgɔl  ‘stick’
ɛgɔ:l  ‘corner’
fuko  ‘head’
feito  ‘to take big handfuls’
ɛku:ku  ‘mouse’
kəku:kul  ‘to cultivate in dry ground’
kəku:kul  ‘type of tree’

Nasal-nasal and nasal-consonant clusters are very common. Of these, only /mb/ and /nd/ occur freely, including at the beginning of a word; /nnl, /mf/ (transcribed here as <nf>, following Sapir), and /ns/ clusters occur only word-medially. The remaining clusters can occur in either medial or final position in a word. In all cases the two
consonants have the same place of articulation (they are homorganic). Both /lt/ and /rt/ occur in medial position, as well, though very rarely. There are no other consonant clusters. Some examples are given in (3):\(^7\)

(3)  
\begin{align*}
\text{k̑gũ:m̑p} & \quad \text{‘ashes’} \\
\text{mba} & \quad \text{‘or’} \\
\text{nimamman̑} & \quad \text{‘I want’} \\
\text{-bunte̱} & \quad \text{‘cause to lie’} \\
\text{nicence̱} & \quad \text{‘I asked’} \\
\text{-man̑} & \quad \text{‘know’} \\
\text{aŋkaŋk} & \quad \text{‘hard’} \\
\text{emunguno} & \quad \text{‘hyena’} \\
\text{fanfaŋ} & \quad \text{‘lots’} \\
\text{ndaw} & \quad \text{‘a man’s name’} \\
\text{-salte} & \quad \text{‘be dirty’} \\
\text{-orti} & \quad \text{‘negative suffix’}
\end{align*}

Kujamaat Jóola syllables are generally of the shape C(onsonant) V(owel), although VC, CVC, and CVNC (where N represents any nasal) syllables occur as well. Vowels may be long or short, except before consonant clusters, where they are always short. Stress is stem-initial.

The most salient feature of Kujamaat Jóola phonology is its pervasive vowel harmony. Vowel harmony is the agreement among vowels in a word with respect to a given feature, such as height, rounding, or backness. We will explore Kujamaat Jóola
vowel harmony in depth in chapter 3. Until then, keep an eye out for how certain morphs influence the shape of Kujamaat Jóola stems, and more often, vice versa.
CHAPTER ONE: EXERCISES

1. Create five new English words.

2. Most words in English make their plural by adding –s, but there are many exceptions.

   Make a list of all the possible ways of forming plurals in English, with examples of each.

3. Many product names are novel English forms coined by marketers. Look at the following list of product names and make hypotheses about how people came up with their names.

   Possibilities include, but are not limited to, the following: (i) combination of elements already occurring in English, (ii) combination of Latin or Greek morphemes, (iii) new use for a term already existing in English, (iv) use of a proper name.

   a) pHisoderm: A pH balanced cleanser
   b) Nescafé: Coffee made by Nestlé
   c) Ajax: A strong, household cleanser
   d) Eucerin: Moisturizing lotion
   e) Friskies: Cat food
   f) Tums: Antacid tablets
   g) Trident: Chewing gum
   h) Life savers: Hard candy shaped like a donut
   i) Kodak: Brand of photographic equipment
   j) Spam: Canned meat similar to ham
4. Isolate the morphemes of each form below. Then, determine whether the stems can occur in isolation, or only in combination with one or more affixes.

a) inky milky cheeky sticky
b) friendly manly cowardly womanly
c) president correspondent student regent
d) adulterous vociferous venous anonymous
e) directness rightness stillness illness
f) detachment merriment torment shipment
g) archaism methodism theism fetishism
h) regal legal frugal conjugal
i) realize moralize actualize atomize
j) denude deodorize delouse debunk
k) beguile behold belabor belittle
l) impart intend import infect
m) intolerable impossible improbable intangible
n) evolve evoke evade erode
o) retain revolve resist retail

5. Identify the morphemes in the following forms by comparing the forms below to the stem found in the corresponding infinitives. (An infinitive is a citation form, such as to eat, to jump.) List those forms which have a zero morpheme. Then list those forms that have a zero morpheme plus some other structural difference. Finally, list the forms that have some other overt change from the infinitive. (Adapted from Nida 1965: 55.)
walked  fought  sang  rode
played  jumped  bled  slept
ran  pounded  kept  bought
hit  cut  meant
met  split  rang
worked  spit  swam

6.  English (Nida 1965: 74)

   Write the verb and corresponding noun forms out in phonemic notation. Determine the pattern of stress change.

   a) inlay
   b) impact
   c) import
   d) increase
   e) contrast
   f) insult
   g) insert
   h) protest
   i) convert
   j) transfer
   k) convict
   l) project
   m) rebel
n) conflict

7. Aztec, Veracruz dialect (Mexico) (Nida 1965: 11)

List all morphemes and give the meaning of each.

- ikalwewe ‘his big house’
- petatci-n ‘little mat’
- ikalsosol ‘his old house’
- ikalmeh ‘his houses’
- ikalci-n ‘his little house’
- komitmeh ‘cooking-pots’
- komitwewe ‘big cooking-pot’
- petatmeh ‘mats’
- komitsosol ‘old cooking pot’
- ko-yameci-n ‘little pig’
- komitci-n ‘little cooking-pot’
- ko-yamewewe ‘big male pig’
- petatwewe ‘big mat’
- ko-yameilama ‘big female pig’
- petatsosol ‘old mat’
- ko-yamemeh ‘pigs’

8. Zoque (Mexico) (Nida 1965: 12)

List all morphemes and give the meaning of each.

- pøn ‘man’
- yomotañm ‘women’
- pøntañm ‘men’
- yomohiñη ‘with a woman’
- pønkøsi ‘on a man’
- yomotih ‘just a woman’
- pønkotoya ‘for a man’
- yomoñune ‘girl’
- pønhìñη ‘with a man’
- kahñìñune ‘chick’
<table>
<thead>
<tr>
<th>Morpheme</th>
<th>Meaning</th>
<th>Morpheme</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>pɔnkɔsita?m</td>
<td>‘on men’</td>
<td>kahji</td>
<td>‘hen’</td>
</tr>
<tr>
<td>pɔnkɔsi?eh</td>
<td>‘as on a man’</td>
<td>libru</td>
<td>‘book’</td>
</tr>
<tr>
<td>pɔn?eh</td>
<td>‘manlike’</td>
<td>libru?une</td>
<td>‘booklet’</td>
</tr>
<tr>
<td>pɔn?ehta?m</td>
<td>‘like men’</td>
<td>wetu</td>
<td>‘fox’</td>
</tr>
<tr>
<td>nanah</td>
<td>‘mother’</td>
<td>wetu?une</td>
<td>‘fox whelp’</td>
</tr>
<tr>
<td>nanahta?m</td>
<td>‘mothers’</td>
<td>te? pɔn</td>
<td>‘the man’</td>
</tr>
<tr>
<td>nanahkotoya</td>
<td>‘for a mother’</td>
<td>maŋu te? pɔn</td>
<td>‘the man went’</td>
</tr>
<tr>
<td>?unehi?ŋ</td>
<td>‘with a child’</td>
<td>maŋjpa te? pɔn</td>
<td>‘the man goes’</td>
</tr>
<tr>
<td>?unehi?ŋta?m</td>
<td>‘with children’</td>
<td>maŋke?tpa te? yomo</td>
<td>‘the woman also goes’</td>
</tr>
<tr>
<td>naka</td>
<td>‘skin, leather’</td>
<td>minpa te? ?une</td>
<td>‘the child comes’</td>
</tr>
<tr>
<td>nakapit</td>
<td>‘by means of leather’</td>
<td>minu te? ?une</td>
<td>‘the child came’</td>
</tr>
<tr>
<td>nakapit?eh</td>
<td>‘as if by leather’</td>
<td>maŋke?tu</td>
<td>‘he also went’</td>
</tr>
<tr>
<td>yomo</td>
<td>‘woman’</td>
<td>maŋutih</td>
<td>‘he went (and did nothing more)’</td>
</tr>
</tbody>
</table>

9. **Congo Swahili, Elisabethville dialect**

List all morphemes and give the meaning of each.

<table>
<thead>
<tr>
<th>Morpheme</th>
<th>Meaning</th>
<th>Morpheme</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ninasema</td>
<td>‘I speak’</td>
<td>ninaona</td>
<td>‘I see’</td>
</tr>
<tr>
<td>wunasema</td>
<td>‘you (sg.) speak’</td>
<td>ninamupika</td>
<td>‘I hit him’</td>
</tr>
<tr>
<td>anasema</td>
<td>‘he speaks’</td>
<td>tunasema</td>
<td>‘we speak’</td>
</tr>
<tr>
<td>munasema</td>
<td>‘you (pl.) speak’</td>
<td>wutakapikiwa</td>
<td>‘you (sg.) will be hit’</td>
</tr>
<tr>
<td>wanasesma</td>
<td>‘they speak’</td>
<td>ninapikiwa</td>
<td>‘I am hit’</td>
</tr>
</tbody>
</table>
ninapika ‘I hit’
nilanupika ‘I hit you (pl.)’
ninakupika ‘I hit you (sg.)’
ninawapika ‘I hit them’
ananipika ‘he hits me’
ananupika ‘he hits you (pl.)’
nilipika ‘I have hit’
nilikaka ‘I hit (remote time)’
wunapikizwa ‘you (sg.) cause being hit’
wunanipikizwa ‘you (sg.) cause me to be hit’
unanipika ‘I do not hit you (pl.)’
hatanupika ‘he does not hit you (pl.)’
hutanupika ‘we do not hit you (pl.)’
hawatatupika ‘they do not hit us’
unapikizwa ‘you (sg.) will cause me to be hit’

Supplementary information:

a. The future -taka- and the negative -ta- are not related.

b. The final -a may be treated as a morpheme. Its meaning is not indicated in this set.

c. The passive morpheme may be described as having two forms, -iw- and -w-. Its form depends on what precedes it.

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1 We thank Krin Gabbard for the etymology of rebop.

2 This statement is almost true. Vietnamese has no affixes, but it does have compound words.

3 Nida has six principles; we present four here.
Nida uses the word *morpheme*. We have chosen to use the word *sign* here on principled grounds.


We choose to present the Jóola data in the transcription systems used by the above-mentioned authors because being able to deal with different transcription systems is an essential skill for all linguists. Elsewhere in this book, we will generally use IPA transcription.

In subsequent chapters NC clusters will be written <nj>, <nc>, <ng>, and <nk>, respectively, following Sapir. In other words, we do not represent assimilation in place of the nasal to the following consonant (e.g., /ŋk/).