CHAPTER FOURTEEN

Morphology, Part 1

In volume one you were introduced to the International Phonetic Alphabet and were given practice in applying it to German. You have now been introduced to the concept of the *phoneme*, and the consonant and vowel phonemes of German and some of their allophones have been described. Finally you have been given a brief introduction to some phonological processes in German. It is now time to move on to larger units of language, to words and to sentences.

We will begin with *morphology*. Morphology is concerned with small meaningful units on the grammatical level of language. Up to now we have dealt exclusively with the phonological (sound) level of language. The smallest units on the phonological level of language are called *phonemes*. Phonemes serve to distinguish meaning but have no meaning themselves. The difference in meaning between *Kasse* and *Gasse* has nothing to do with any inherent difference in meaning between /k/ and /g/, just as the difference between English *mist* and *fist* has nothing to do with any inherent meaning difference between /m/ and /f/ in English. Words mean what they do because the speakers of a language are in general agreement as to what they mean, not because the sounds themselves have any inherent meaning. The assignment of meaning to a particular sound sequence seems to be totally arbitrary.

A *morpheme* is the smallest meaningful unit on the grammatical level of language. *Meaning* is to be understood in a very broad sense here, to encompass both *lexical* meaning (dictionary meaning) and *grammatical* meaning. We will return to this distinction in a moment.

Morphemes are constructed of phonemes. **A morpheme is a sequence of phonemes with a meaning**. A morpheme can be of practically any length. The German word *an* /'an/ is a morpheme which consists of two phonemes. *Berlin* /bɛr'lin/ is a morpheme consisting of six phonemes and two syllables. A morpheme is therefore not identical with a syllable - *Berlin* is one morpheme but two syllables. Nor is a morpheme necessarily identical with a word. Both *an* and *Berlin* are one-morpheme words, but a word like *Leberkrankheiten* contains four morphemes, *am* contains two and *Berliner* contains two or three, depending on whether it is intended to be singular or plural.

Berlin consists of only one morpheme because it cannot be subdivided into meaningful units. The same is true of *an*. *Leberkrankheiten*, on the other hand, can be subdivided into *Leber* "liver", *krank* "sick", *heit* "suffix which turns an adjective into a noun" and *en* "noun plural". We can see that *heit* and *en* have a different kind of meaning from *Leber* and *krank*. The latter we call lexical morphemes, i.e. the kind that are conventionally contained in dictionaries, while the former we call grammatical morphemes, a term which is difficult to define, but the distinction between lexical and grammatical should be clear enough from the examples given.

There are certain techniques involved in isolating the morphemes of a language. Before we look at German we will consider a few languages spoken in other parts of the world which are not related to German.

The following data come from Zoque, an American Indian language spoken in Mexico[1]. The phonological forms are given followed by an English translation, conventionally referred to as a *gloss*. The transcription is intended to be phonemic. Slant lines around each Zoque form are omitted as a convenience.

1)	pən	"man"	pəntaʔm	"men"
2)	nanah	"mother"	nanahtaʔm	"mothers"
3)	yomo	"woman"	yomotaʔm	"women"
4)	ʔune	"child"	ʔunetaʔm	"children"

The technique involved is to look for items which recur (occur more than once) with the same meaning. The data here consist of four lexical morphemes and one grammatical morpheme. /pən/ occurs twice in this sample and appears to have the same meaning - "man". /nanah/ occurs twice and has the same meaning - "mother". /yomo/ occurs twice and has the same meaning - "woman". And /ʔune/ occurs twice and means "child" in both occurrences. Finally, /taʔm/ occurs four times and always means something like "more than one of the preceding noun", i.e. *Noun Plural*. The simplest way to arrive at this analysis is to subtract the singular forms from the plural forms. What is left, /taʔm/, must be what accounts for the difference in meaning between the forms in the left column and those in the right column.

This is a simple and very straightforward example. This information has, of course, been carefully chosen to make plural formation appear very simple in this language when it might, in fact, be much more complicated. For instance, consider a Zoque speaker trying to analyse English and confronted with the data above. He or she would probably conclude that noun plural formation in English is extremely complicated, when we know that it is, in fact, relatively simple.

Let us now look at a second example. These data[2] come from Ganda, a language of Uganda.

1)	omukazi	"woman"	abakazi	"women"
2)	omusawo	"doctor"	abasawo	"doctors"
3)	omusika	"heir"	abasika	"heirs"
4)	omuwala	"girl"	abawala	"girls"
5)	omulenzi	"boy"	abalenzi	"boys"

Each word consists of two parts, both of which recur. All of the words in the left column contain /omu/. All of the words in the right column contain /aba/ precisely where the words in the left column contain /omu/. The second half of each word in the left column is identical to the second half of a word in the right column, which is to say that /kazi/, /sawo/, /sika/, /wala/ and /lenzi/ occur in both columns. To these *recurrent partials* (partial = part of a word) we assign the lexical meanings "woman", "doctor", "heir", "girl" and "boy" respectively. What we have done is to

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[1]These data are taken from Nida, Eugene A. 1949. *Morphology: The Descriptive Analysis of Words*. 2nd edition. Ann Arbor: University of Michigan Press.

[2]Data from Gleason, Henry A., Jr. 1955. *Workbook in Descriptive Linguistics*. New York: Holt, Rinehart and Winston, Inc.

assign the part of the meaning which is the same in the left and right columns to the parts of the words which are identical in both columns. And we will now assign the parts of the meanings which are different to the parts of the words which are different. /omu/ occurs only in singular forms; /aba/ occurs only in plural forms. We therefore assign the grammatical meaning "Noun Singular" to /omu/ and the meaning "Noun Plural" to /aba/.

A final exotic example follows, this time from Kekchi[3], an American Indian language spoken in Guatemala.

1)	tinbeq	"I will walk"
2)	tatbeq	"you will walk"
3)	ninbeq	"I walk"

The one thing common to all three of these forms is /beq/. The one common element of meaning is "walk". Therefore we (tentatively) equate /beq/ with "walk". Forms 1) and 2) differ by one element of meaning - 1st person singular vs. second person singular. It seems reasonable to consider the difference in form between 1) and 2) to be responsible for the difference in meaning. After all, the hearer of the utterance has nothing else to go on. /tinbeq/ contains the phonemic sequence /in/ where /tatbeq/ contains the sequence /at/. Therefore /in/ is (tentatively) equated with "I" and /at/ with "you". 1) and 2) form a *morphological minimal pair* in much the same way the *Kasse* and *Gasse* form a phonological minimal pair. Just as *Kasse* and *Gasse* differ by one element of sound, /tinbeq/ and /tatabeq/ differ by one element of meaning.

1) and 3) form another morphological minimal pair (as well as a phonological minimal pair). The difference in meaning between "I will walk" and "I walk" is a difference between future and present respectively. The difference between /tinbeq/ and /ninbeq/ is the difference between the initial sounds /t/ and /n/. We therefore identify /t/ with FUTURE and /n/ with PRESENT. We have therefore identified five morphemes: /t/ FUTURE, /n/ PRESENT, /in/ "I", /at/ "you", /beq/ "walk". Given these three forms we should be able to predict reasonably confidently that "You walk" would be /natbeq/.

In all of the examples which we have looked at so far, each morpheme has had the same phonemic shape in each of its occurrences. This is, of course, not always the case. Morphemes, like phonemes, are abstract units and may have more than one concrete realisation.

Let us now turn to English for an instance of different concrete forms of the same underlying morpheme.

English plural formation is quite straightforward, or so we are told. To form the plural of a noun in English we simply add an *s*, although on occasion we add *es*. And a handful of English plurals are irregular. Let us look first at some regular forms.

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[3]These data are from Nida 1949.

Examples:	*Singular*	*Plural*	*Formed by adding*
	horse	horses	-s
	dog	dogs	-s
	cat	cats	-s
	boy	boys	-s
	batch	batches	-es
	badge	badges	-s
	rose	roses	-s
	bush	bushes	-es
	garage	garages	-s

What we are looking at in this table is part of the spelling system of English. We should know by now that spelling in English (and in German) is not phonemic. The chart will be repeated here, but this time in phonemic transcription.

Singular	*Plural*	*Formed by adding*
/ˈhɔs/	/ˈhɔsəz/	/-əz/
/ˈdɔg/	/ˈdɔgz/	/-z/
/ˈkæt/	/ˈkæts/	/-s/
/ˈbɔɪ/	/ˈbɔɪz/	/-z/
/ˈbætʃ/	/ˈbætʃəz/	/-əz/
/ˈbædʒ/	/ˈbædʒəz/	/-əz/
/ˈroz/	/ˈrozəz/	/-əz/
/ˈbʊʃ/	/ˈbʊʃəz/	/-əz/
/ˈgæraʒ/	/ˈgæraʒəz/	/-əz/

The second table tells a different story. In the first table *-s* was added seven times and *-es* twice, but in the second table /-əz/ is added in six instances, /-z/ in two and /-s/ in only one. We are dealing with three distinct phonemic sequences here, /-s/, /-z/ and /əz/.

There is, despite this apparently confusing situation, complete predictability as to which ending will be used. Let us look at these and some additional examples:

/-s/ occurs in *caps, cats, backs, gaffs, breaths*
/-z/ occurs in *cabs, cads, bags, leaves, paths, pins, homes, songs, rolls, cars, paws, boys*
/-əz/ occurs in *gases, roses, batches, badges, ashes, garages*

This is, of course, **complementary distribution**. The different forms of the plural morpheme occur in mutually exclusive phonetic environments. We should now be able to make a general statement about the distribution of these different forms of the English plural. /-əz/ occurs after nouns which end in /s,z,ʃ,ʒ,tʃ,dʒ/. These are s-like or sh-like sounds, commonly referred to as *sibilants*. /-əz/ occurs after sibilants and only after sibilants. /-s/ occurs after other voiceless sounds. The only voiceless sounds in English (and German) are consonants, so /-s/ occurs after voiceless non-sibilant consonants, i.e. after /p,t,k,f,θ[4]/. And /-z/ occurs elsewhere, *elsewhere* being in this instance after voiced non-sibilants, which include vowels.

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[4] /θ/ is the IPA symbol for the voiceless "th" of words like *breath, thin,* whereas /ð/ is used for the voiced "th" of words like *this*, *then* and *paths*.

These different concrete forms of morphemes are called *allomorphs*. Allomorphs are to morphemes as allophones are to phonemes. Allomorphs of a morpheme: (1) have the same meaning and (2) occur in complementary distribution. The English noun plural has several allomorphs. The three allomorphs which we have just dealt with are predictable on the basis of the phonetic environment in which they occur. This type of predictability is called *phonological conditioning*, and we say that the choice of the allomorphs /-s, -z, -əz/ of the English noun plural is **phonologically conditioned**.

There are, of course, a few irregular noun plurals in English. *Man* has the plural *men* (/'mæn/ ≠ /'mɛn/), *goose* has the plural *geese* (/'gus/ ≠ /'gis/), *ox* has the plural *oxen* with the ending /-ən/, *sheep* has the plural *sheep*. Let us take the last form first.

In sentence 1) below every word is a singular. That *sheep* is singular is shown by the fact that it is preceded by a singular article *this* and by the fact that the verb which agrees with it in person and number is singular *is*. In sentence 2) every word is plural. That *sheep* is plural is indicated by the fact that it is preceded by a plural article *these* and by the fact that the verb is plural.

    1) This sheep is a Merino.
    2) These sheep are Merinos.

These sentences are parallel to sentences like 3) and 4), where the singular-plural distinction is clearly marked on the nouns.

    3) This cat is an Abyssinian.
    4) These cats are Abyssinians.

Sheep, along with a number of other words for certain types of animals, has the same form in the singular as in the plural. This is simply a characteristic of these words. We will return to this example in a moment.

Ox has the plural *oxen*. Given the fact that *ox* is /'ɒks/, which ends in /s/, we would expect the plural to be **oxes*[5] (/'ɒksəz/), just as the plural of *box* is *boxes*, not **boxen* and the plural of *fox* is *foxes*, not **foxen*. The phonetic environment is the same in *ox*, *box* and *fox* - all end in /ɒks/. The fact that *ox* takes the ending /-ən/ is a peculiarity of that particular morpheme. The choice of /-ən/ is not phonologically conditioned. It is **morphologically conditioned**, which is to say that it is the morpheme *ox* itself rather than its phonological shape which conditions the choice of allomorph of the plural. Morphological conditioning can be thought of simply as non-predictability or irregularity.

Up until this point all of the allomorphs of the plural in English have been endings, i.e. have been phonological material added to the ends of the nouns in question. What, then, do we do with *sheep* and its plural *sheep*? The usual approach is to treat *sheep* (plural) as having a structure similar to *cats*, i.e. as consisting of a noun plus an ending. In this case the ending is zero (symbolised -∅), making -∅ another allomorph of the noun plural in English. The use of a zero suffix in *sheep* (and also in *trout*, *salmon*, *deer*) may seem to be an analytic trick, but it is necessary to distinguish *sheep* singular from *sheep* plural in some way. Every single occurrence of the noun *sheep* is either singular or plural, just as every occurrence of any other English noun will be either singular or plural. As we have seen in sentences 1) and 2) above, other elements in the utterance are sensitive to the singularity or plurality of *sheep*. The difference between *sheep* and *cat* is that *sheep* is

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[5]The asterisk (*) before a form is used to indicate that the form does not occur.

ambiguous between singular and plural and that *cat* is not, but every occurrence of *sheep* is still either a singular or a plural. Our analysis indicates this by representing the singular as /'ʃip/ and the plural as /'ʃip + Ø/, just as *cat* is /'kæt/ and *cats* is /'kæt + s/. This type of analysis seems to fit well with the intuition of the native speaker of English that every plural noun of English consists of a singular noun plus something else, even if it is zero. In German, zero is a frequently used noun plural allomorph.

Finally there remain the plurals *men*, *geese*, *mice*, *lice*, *feet*, *women* and *children*. *Children* is different from the rest of these in that it has an overt ending, so we will treat it last. The others differ from their singulars in that the vowel of the plural is different from the vowel of the singular. Thus we have /'mæn/ ≠ /'mɛn/, /'gus/ ≠ /'gis/, /'maʊs/ ≠ /'maɪs/, /'laʊs/ ≠ /'laɪs/, /'fʊt/ ≠ /'fit/, /'wʊmən/ ≠ /'wɪmən/. The *process* that seems to take place here is that the vowel of the singular is *replaced* by another vowel, e.g. /æ/ is replaced by /ɛ/ to form the plural of /'mæn/. This is obviously morphological as opposed to phonological conditioning, for words which rhyme with *man* form their plurals by adding /-z/, which is what we would expect, e.g. *bans, cans, pans*. Irregular plural forms like *men* and *geese*, however, cannot be analysed as noun + ending, although they can certainly be analysed as noun + *something*, because the native speaker's intuition is that, e.g. *geese* is *goose* + *plural*, just as *cats* is *cat* + *plural*. What is usually done is to analyse /'mæn/, /'gus/ etc. as single morphemes and then to analyse the allomorphs of the plural as the actual process of replacement of /æ/ by /ɛ/, /u/ by /i/ etc. /'mɛn/ therefore consists of two morphemes, /'mæn/ and PLURAL. PLURAL in this case takes the form of the replacement of /æ/ by /ɛ/. The other forms can be analysed in a similar fashion. This type of replacement is rare in English nouns, although it is quite common in verbs in English. In German it is common in nouns, verbs and in the comparison of adjectives.

Thus far we have the following allomorphs of the noun plural morpheme in English:

> 1) /-əz/, occurring after nouns which end in sibilants,
> 2) /-z/, occurring after nouns which end in other voiced sounds,
> 3) /-s/, occurring after nouns which end in other voiceless consonants,
> 4) /-ən/, occurring after the noun /'ɒks/ *ox*,
> 5) /-Ø/, occurring after *sheep*, *fish*, *moose* and a number of other words for animals,
> 6) replacives, including:
> > /æ/ is replaced by /ɛ/ in /'mæn/,
> > /u/ is replaced by /i/ in /'gus/,
> > /aʊ/ is replaced by /aɪ/ in /'maʊs, 'laʊs/,
> > /ʊ/ is replaced by /i/ in /'fʊt/,
> > /ʊ/ is replaced by /ɪ/ in /'wʊmən/.

The choice of 1) - 3) above is phonologically conditioned, while the choice of the others is morphologically conditioned.

Child /'tʃaɪld/ with its plural *Children* /tʃɪldrən/ represents a blending of a replacive (/aɪ/ is replaced by /ɪ/) plus the addition of an ending /-rən/, which occurs in no other English noun plural. This is obviously morphological conditioning with a vengeance.

Types of morphemes

We have already seen that a word can consist of more than one morpheme. The word *horses* consists of two morphemes, /'hɔs/ and a morpheme we can call "noun plural" and which we can