

CHAPTER TWELVE

The Phonemes of German

THE CONSONANTS

At the end of Chapter Eleven it was stated that German has 20 consonant phonemes. In our IPA transcriptions we have been using 22 different consonant symbols, so two of these must not represent phonemes in their own right.

When determining the phonemes of a language we are interested in **inventory** and **distribution**. The inventory is the set of phonemes. The distribution is a set of statements about the environments in which the phonemes can occur, e.g. at any point in a word, only initially, etc., and the form they take in those environments. With these two factors in mind, let us again list the consonants of German as we have been transcribing them, this time giving, where possible, examples with the consonants in word-initial position, in word-medial position (between vowels), and in word-final position¹.

Consonant	Initially	Medially	Finally
[p]	passe [ˈpasə]	Raupen [ˈraʊpən]	rieb [ˈriːp]
[b]	Bass [ˈbas]	rauben [ˈraʊbən]	
[t]	Tasse [ˈtasə]	baten [ˈbaːtən]	riet [ˈriːt]
[d]	das [ˈdas]	baden [ˈbaːdən]	
[k]	Kasse [ˈkasə]	Haken [ˈhɑːkən]	Sieg [ˈziːk]
[g]	Gasse [ˈgasə]	Hagen [ˈhɑːgən]	
[f]	fasse [ˈfasə]	Höfe [ˈhøːfə]	reif [ˈraɪf]
[v]	was [ˈvas]	Löwe [ˈløːvə]	
[s]		reißen [ˈraɪsən]	Reis [ˈraɪs]
[z]	Satz [ˈzats]	reisen [ˈraɪzən]	
[ʃ]	Schatz [ˈʃats]	rauschen [ˈraʊʃən]	Rausch [ˈraʊʃ]
[ʒ]	Genie [ʒeˈniː]	Rage [ˈrɑːʒə]	
[ç]	China [ˈçiːna]	reichen [ˈraɪçən]	reich [ˈraɪç]
[x]		rauchen [ˈraʊxən]	Rauch [ˈraʊx]
[m]	Masse [ˈmasə]	hemmen [ˈhɛmən]	Ramm [ˈram]
[n]	nasse [ˈnasə]	Hennen [ˈhɛnən]	rann [ˈran]
[ŋ]		hängen [ˈhɛŋən]	rang [ˈraŋ]
[l]	lasse [ˈlasə]	Kohle [ˈkoːlə]	will [ˈvɪl]
[ʀ]	Rasse [ˈrasə]	bohre [ˈbøːrə]	wirr [ˈvɪr]
[ʁ]			wir [ˈvɪːʁ]
[j]	Jacke [ˈjakə]	Koje [ˈkoːjə]	
[h]	hasse [ˈhasə]		

¹This list, with certain minor changes, is taken from Moulton (1962:21).

All consonants are listed in [] to indicate that we are not prejudging which are phonemes and which are allophones of some other phoneme. One obvious thing to look for is gaps, and there are plenty of them here. We notice, for instance, that [b,d,g,v,z,ʒ] do not occur word-finally, whereas [p,t,k,f,s,ʃ] **do** occur in that position. This might indicate that [b] and [p] are allophones of one phoneme. This does not turn out to be the case, however, for [b] and [p] are clearly in contrast. Substituting one for the other changes meaning. *Bass* ≠ *Pass*; *Raupen* ≠ *rauben*. The same is true of the other voiceless-voiced pairs. **None of the voiced obstruents occurs word-finally**. This is simply a rule of German phonology.

One set of gaps has been eliminated. Let us now look at some others. We have already discussed the complementary distribution of /h/ and /ŋ/. Lack of phonetic similarity rules out grouping them together.

We are left with the gaps in the distribution of [s] and [z] and with the gaps in the distribution of [ʀ] and [ʁ].

[s] and [z] are not in contrast initially or finally, but they are in contrast in medial position: [ˈraɪsən] and [ˈraɪzən] are a minimal pair - they mean different things. Therefore /s/ and /z/ are different phonemes, even though both of them have a somewhat strange distribution. /z/ never occurs finally, but /z/ is a voiced obstruent, and we have already seen that voiced obstruents never occur finally. /z/ is therefore regular in that respect. /s/ does not occur initially, but occurs medially, in contrast with /z/, and finally. This is a gap in the distribution of /s/. Such gaps occur, as we have seen before with voiced obstruents, which do not occur finally. /s/ does not occur initially, and we must simply record that fact and move on.

[ʀ] and [ʁ] seem to be in contrast only in word-final position. But a little testing will show that they are, in fact, **never** in contrast. The distribution is as follows:

- [ʀ] occurs 1) initially, 2) medially, 3) finally after lax vowel,
- [ʁ] occurs only after tense vowels when not followed by another vowel.

Furthermore, [ʁ] alternates with [ʀ] in different forms of the same word. For instance, *ihr* "her" is [ˈʔi:ʁ] in a phrase like *ihr Buch* "her book". But in a phrase like *ihre Bücher* it is [ˈʔi:ʀə]. Here the phonetic environments are different. In [ˈʔi:ʁ], [ʁ] occurs at the end of a word after a tense vowel. In [ˈʔi:ʀə], [ʀ] occurs between vowels. [ʁ] and [ʀ] are therefore in complementary distribution in that they never occur in the same environment, and therefore they can be grouped together as allophones of one phoneme, which we can call /r/. We will symbolise the concept of alternation with the symbol ~ and write [ʀ] ~ [ʁ] to indicate that the two allophones of /r/ alternate with each other.

The other grouping we can make is [ç] and [x]. These two are in complementary distribution and therefore never occur in the same environment. Only [ç] occurs initially². Both occur medially and finally, but further investigation shows that even in those positions they are not in contrast. The distribution is as follows:

²Bear in mind that we are describing *North* German standard speech. In the South [ç] does not occur initially. *China* is pronounced [ˈki:na].

[ç] occurs 1) initially, 2) medially and finally after /i,ɪ,y,ʏ,e,ɛ,ø,œ,aɪ,ɔɪ/, 3) after the consonants /n,l,r/.

[x] occurs medially and finally only after /ɑ,a,o,ɔ,u,ʊ/ and /aʊ/.

In other words, [x] occurs only after back vowels, and [ç] occurs after front vowels, after consonants and at the beginnings of words. Put even more simply, [x] occurs after back vowels and [ç] occurs elsewhere. [x] alternates with [ç] in many pairs of words, typically in noun singulars and plurals. *Loch* vs. *Löcher* is an instance. *Loch* [ˈlɔx] ~ *Löcher* [ˈlœçɐ]. *Bauch* [ˈbaʊx] ~ *Bäuche* [ˈbɔɪçə]. *Buch* [ˈbuːx] ~ *Bücher* [ˈbyːçɐ]. *Dach* [ˈdax] ~ *Dächer* [ˈdɛçɐ]. This alternation is a result of the vowel alternations in the noun singulars and plurals.

Now that the consonant sounds of German have been grouped into phonemes, we are in a position to revise the chart of German consonants given in Figure 8.3. The new chart will include only the consonant **phonemes**. This means that the glottal stop, which is always a part of an allophonic variant of a vowel, will not be included. [ç] is not included, as it is an allophone of /x/, and [ŋ] is not included as it is an allophone of /r/.

	Labial	Apico-Alveolar	Dorso-Palatal	Dorso-Velar	Dorso-Uvular	Glottal
stops						
voiceless	p	t		k		
voiced	b	d		g		
fricatives						
voiceless	f	s	ʃ	x		h
voiced	v	z	ʒ			
nasals	m	n		ŋ		
liquids		l			r	
semivowel			j			

Legend: **position of articulation** horizontally

manner of articulation (stop ≠ fricative), **nasals**, **liquids** and **semivowel** vertically
voiced versus voiceless is indicated only for stops and fricatives (i.e. **obstruents**), since all nasals, liquids and semivowels are inherently **voiced**.

Figure 12.1 - Features of articulation of German consonant phonemes

When we describe German consonant **phonemes** now, we can confine our description to the features given in this table. /p/ is a voiceless bilabial stop. Whether or not it is aspirated is not part of its phonemic description but rather of its phonetic description. For a phonemic description it is necessary to mention only those articulatory features which consistently distinguish a particular phoneme, in this case /p/, from all other phonemes in the language. /p/ is distinguished from /b/ by voice, /p/ is distinguished from /t/ and /k/ by place of articulation, /p/ is distinguished

from /f/ by manner of articulation and from /m/ by being oral and not nasal. In **phonemic** terms it is not necessary to say more. In a **phonetic** description we would have to add that the allophone of /p/ used in word-initial position is aspirated, that the allophone used after /f/ is unaspirated, and that there is free variation between aspirated, unaspirated and unreleased variants in final position. Since these variants are automatic and therefore predictable, we need not distinguish among them and can refer to them collectively as /p/. The same is true of other phonemes.

The distribution of German consonant phonemes

Now that we have determined the consonant inventory of German we can proceed to discuss the distribution of the various consonant phonemes. A complete discussion would include such matters as the combinations various consonants can occur in. Combinations of consonants are called consonant **clusters**. A complete description of consonant clusters is beyond the scope of this work. We will be concerned in this section with gaps in the distribution of German consonant phonemes and with positional variants (allophones). Clusters will be mentioned only insofar as they involve one of these factors.

Obstruents

The German obstruents (stops and fricatives) occur in neatly matched pairs with two exceptions. There are three voiceless stops matched by three voiced stops, and there are five voiceless fricatives, but there are only three voiced fricatives. /x,h/ have no voiced counterparts.

The stops

The **voiceless stops** /p,t,k/ all share a number of properties. All are aspirated in word initial position, all are unaspirated after /f/ or /s/. (/p/ and /t/ occur after word-initial clusters with /f/, e.g. *speisen*, *steigen* and /k/ occurs after word-initial clusters with /s/, e.g. *Skizze*.) In final position all have three possible allophones - aspirated, unaspirated, unreleased. All alternate with their voiced counterparts, i.e. /p/ ~ /b/ as /t/ ~ /d/ and /k/ ~ /g/, e.g. /'di:p ~ 'di:bə/, /'pfa:t ~ 'pfa:də/, /'tɑ:k ~ 'tɑ:gə/. There are therefore very good reasons to think of the voiceless stops as a natural class of phonemes in German.

The **voiced stops** /b,d,g,/ also share a number of properties. All are unaspirated, none occur in word-final position, and all alternate, as we have just seen, with their voiceless counterparts /p,t,k/. They also form a natural class.

The fricatives

The fricatives do not form as neat a picture as the stops. There are three voiceless-voiced pairs: /f,v/, /s,z/ and /ʃ,ʒ/. The other two voiceless fricatives, /x/ and /h/, do not have voiced counterparts.

/f/ alternates with /v/ in words like /'bra:f ~ 'bra:və/. /s/ alternates with /z/ in words like /'maʊs ~ 'mɔ:izə/.

/s/ and /z/ have somewhat defective distribution. In the North, /s/ occurs initially only in clusters, e.g. /sk/, i.e. /s/ does not occur initially before vowels³. /z/, being a voiced obstruent, does not occur finally. /s/ and /z/ therefore contrast only in medial position, but the difference is very real, as the pair /'raisən/ ≠ /'raizən/ shows.

/ʃ/ does **not** alternate with /ʒ/ in different forms of the same word. This lack of alternation sets this pair off from the other voiceless-voiced obstruent pairs. The reason for this is historical. /ʒ/ occurs only in foreign loans, primarily from French, whereas /ʃ/ is a "native" sound. The two therefore have never occurred in different forms of the same word and hence have never alternated. /ʃ/, predictably, occurs in all environments. /ʒ/, being a voiced obstruent, does not occur finally.

/h/ has strange distribution. It occurs freely initially, e.g. in /'hu:pən/, but it occurs medially only when immediately followed by a stressed vowel, e.g. /bə'hauptən/. It does not occur finally and never occurs in combination with another consonant.

/x/ and its allophones [x] and [ç] have already been sufficiently discussed. It should perhaps be mentioned at this point that the distribution of the allophones as described here does not hold in all varieties of standard German. In Switzerland [x] is typically used after the consonants /l,n,r/ as well as after back vowels, so that the Swiss typically say ['manxə, 'vɛlxə] and ['dʊrx] rather than ['mançə, 'vɛlçə, 'dʊrç], and in Austria [x] is used after /r/, e.g. ['dʊrx]. This is also the usual pattern in Bavaria. In the Rhineland [ç] is often pronounced [ʃ] in all positions.

Resonants

Nasals

/m/ and /n/ occur freely initially, medially and finally. /ŋ/ occurs only medially and finally. Otherwise the nasals are unremarkable, although it is interesting to note that the three nasals have the same positions of articulation as the stop pairs /p,b/, /t,d/ and /k,g/.

Liquids

Liquids are consonants which are vowel-like. German has two, /l/ and /r/. /r/ has one allophone which is very unvoiced-like, namely [ʀ], which is a voiced dorso-uvular fricative. The other allophone, [ʁ], is definitely vowel-like.

The lateral /l/ occurs freely initially, medially and finally. Its major interest for us is its phonetic difference from English /l/, particularly after vowels. Compare the final *l* sound of English *will*, German *will*.

/r/ has the allophones [ʀ] and [ʁ], which we have already discussed, but their distributional characteristics will be repeated here. [ʀ] occurs initially, e.g. ['ʀa:t], medially before vowel, e.g. ['ʀən], and after **lax** vowel before consonant or before word boundary, e.g. ['ʀɪt, 'vɪʀ]. [ʁ] occurs after **tense** vowel before a word boundary or before a consonant, e.g. ['vi:ʁ, 'pfe:ʁt]. This is the

³Except in a few borrowings like *Satin* and *Safeway*.

usual distribution in North German standard speech, although there are a few possible variations on this theme.

Some speakers also use [ɣ] after **lax** vowels before word boundary or consonant so that *irrt* is [ʔɪrɪt] rather than [ʔɪrt]. This is a pronunciation which speakers of Standard German seem quite happy to accept. For such speakers [ʀ] and [ɣ] are in free variation in this one environment but in complementary distribution elsewhere. Many speakers also use a voiceless uvular fricative [χ] after lax vowel before final voiceless consonant, so that *Wirt* is [ˈvɪχt] rather than [ˈvɪrt]. This voiceless [χ] is also accepted quite readily by speakers of the standard. Finally, in the South, including Bavaria, Austria and Switzerland, /r/ is typically articulated in all positions by tapping the tip of the tongue (the apex) against the back of the upper teeth. In these varieties [ʀ] and [ɣ] are not used at all. This dental pronunciation is usually symbolised [ɾ].

There is one final variant of /r/ which we must discuss. This is the final sound of words like *Vater* [ˈfa:tɐ] and *bitter* [ˈbɪtɐ]. We shall see later in this chapter that this is the **phonetic** (i.e. concrete) realisation of the **phonemic** (i.e. abstract) string /ər/ before word boundary or consonant. Further discussion will be postponed until then.

The semivowel /j/

There is very little work to be done here except to establish that /j/ really is a consonant. It is easy to find minimal pairs, e.g. /ˈjakə/ ≠ /ˈhakə/; /ˈko:jə/ ≠ /ˈko:lə/. /j/ thus occurs initially and medially. It does not occur in clusters with other consonants and does not occur finally, unless the final element of the diphthongs /aɪ, ɔɪ/ is analysed as /j/.

THE VOWELS

It is now time to examine the vowel phonemes of German in more detail. As with the consonants, we are interested in inventory and distribution.

The distinctive features of German vowel articulation have already been established. These are **tongue height**, **tongue position**, **lip rounding** and **tenseness**. We have also established that the vowels traditionally referred to as "short", i.e. the lax vowels, are spoken more towards the centre of the mouth than the vowels traditionally referred to as "long", which are spoken more towards the periphery of the mouth. This gives us two convenient subsets of vowels. For each of the seven lax vowels (i.e. for each more centralised vowel) there is a corresponding tense vowel (i.e. a peripheral vowel). This is a remarkably symmetrical system. In the following list⁴ minimal pairs for each tense-lax pair are given in a consistent environment, namely before /lə/.

Stiele	[ˈfti:lə]	Stille	[ˈftɪlə]
stehle	[ˈfte:lə]	Stelle	[ˈftɛlə]
Buhle	[ˈbu:lə]	Bulle	[ˈbʊlə]
Sohle	[ˈzo:lə]	solle	[ˈzɔlə]
fühle	[ˈfy:lə]	fülle	[ˈfʏlə]
Höhle	[ˈhø:lə]	Hölle	[ˈhœlə]
fahle	[ˈfa:lə]	falle	[ˈfalə]

⁴This list is taken from Moulton (1962:61).

/i, y, e, ø/ are articulated with the tongue higher and further forward than are /ɪ, ʏ, ε, œ/, and /u, o/ are articulated with the tongue higher and further back than are /ʊ, ɔ/. /a/ is articulated with the tongue lower and with the mouth more open than /a/.

In addition to these fourteen paired vowels there are three diphthongs /aɪ, aʊ, ɔɪ/ and the unstressed vowels /ə/ and [ɐ]. And there is a long /ɛ:/, which is prescribed by all of the pronouncing dictionaries, but which is used irregularly by most speakers of standard German and not at all by some. We shall have more to say about /ɛ:/ later, but for now we will merely mention that this is the vowel one is **supposed** to use to pronounce what is written *ä* in such words as *spät, Universität, wären*.

The tense vowels are phonetically quite long when stressed, and the lax vowels are phonetically very short. The long-short distinction is neutralised in unstressed position, where all vowels are short. The tense-lax distinction is maintained, however, in unstressed position, thus demonstrating that the **phonemic** distinction between /i/ and /ɪ/ is tense-lax, while the distinction long-short is merely **phonetic**, albeit still very important for those of us who wish to speak German the way the Germans do.

English vowels and German vowels

It is worthwhile comparing German vowels with Australian vowels at this point, since the systems are quite different, both phonemically and phonetically. Australian English is usually analysed as having nineteen stressed vowel phonemes and one unstressed vowel phoneme. The nineteen stressed vowels are illustrated in the following list of words.

peat, pit, pate, pet, pat, part, pot, bought, boat, put, boot,
Bert, but, bite, bout, Boyd, beer, bear, tour.

English, like German, also has a vowel which occurs only in unstressed syllables, and as in German the vowel is /ə/. One problem for speakers of Australian English is that there is only the one vowel which occurs only in unstressed syllables, whereas German has two. This leads many Australians not to distinguish between *bitte* and *bitter*, for instance, using for both the Australian version of /ə/, which is not phonetically identical with **either** German vowel.

Something else which causes a problem for Australians, along with most other speakers of English, is the fact that the phonetic realisation of most vowels in English is a diphthong. This is especially true of the tense high and mid vowels in words like *peat, pate, boot* and *boat*. The corresponding vowels in German are all long monophthongs which are never diphthongs. Diphthongising these vowels in German, i.e. pronouncing them as if they were English vowels, leads to a very obvious and easily detectable foreign accent in German. In addition to this, most of the lax vowels of English can also be diphthongised, particularly before voiced consonants. All English vowels are phonetically longer before voiced consonants than before voiceless consonants, e.g. *bet, bed; beat, bead*. German lax vowels are always phonetically very short. Substituting English vowels for their perceived German counterparts again leads to a detectable foreign accent in German.

Vowels before /r/

The Australian vowels in the English words *beer, bear* and *tour* are conventionally symbolised /ɪə/, /eə/ and /ʊə/. These three diphthongs often occur before intervocalic /r/ in extended forms, e.g. [ˈbɪəri], [ˈbɛəriŋ], [ˈtʊəriŋ]. I have used [r] here to represent English intervocalic *r*, which is quite

different from any variety of German /r/. We can establish by comparing Australian English with other varieties, e.g. Irish English and the English spoken by most North Americans, that, with a very few exceptions such as *Theatre*, these three vowels occur before what was until relatively recently an /r/. English spelling, which proceeds primarily on historical principles, retains -r in most words which, in Australian English, contain these vowels. Irish English and most varieties of American English retain the [r]. Given these facts, it is evident that these three vowels in Australian English developed from earlier sequences of vowel + /r/.

The first elements of these diphthongs are all lower than the first elements of the German [i:r], [e:r], [u:r] in *Bier*, *der*, *Uhr*. Substituting the Australian vowels /ɪə/, /ɛə/ and /ʊə/ for their German counterparts results in a detectable mispronunciation and can also lead to confusion.

In English there is a contrast between tense vowels and their lax counterparts only before intervocalic /r/. *Nearer* and *mirror* have /ɪə/ and /ɪ/ respectively. *Mary* and *merry* have /ɛə/ and /ɛ/ respectively. *Touring* and *fury* have /ʊə/ and /ʊ/ respectively. On the other hand, there is no contrast in monosyllables in Australian English.

In German, tense **and** lax vowels contrast before /r/ in all positions. Before intervocalic /r/ German has such contrasts as⁵:

ihre ≠ *irre*, *zehre* ≠ *zerre*, *Haare* ≠ *harre*, *bohre* ≠ *Lorre*, *Fuhre* ≠ *murre*, *führe* ≠ *Dürre*,
höre ≠ *dörre*.

Before word final /r/ or /r/ + consonant German has such contrasts as:

Wir ≠ *wirr*, *Heer* ≠ *Herr*, *Haar* ≠ *Narr*, *bohrt* ≠ *Bord*, *Geburt* ≠ *Kurt*, *Tür* ≠ *dürr*,
hört ≠ *dörtr*.

It is sometimes difficult for Australian students of German to hear the differences between these vowels. The reason is, of course, the lack of such contrasts in English. Furthermore, the fact that the first element of the diphthongs /ɪə/, /ɛə/ and /ʊə/ is always lower than the first element of the German phonemic sequences /ir/, /er/, /ur/ causes German speakers to hear the Australian vowels as [ɪɹ], [ɛɹ] and [ʊɹ] respectively, which are acceptable alternatives in Standard German for [ɪr], [er] and [ʊr], but **not** for /ir, er, ur/. It is thus necessary for Australian students of German to be aware that German tense and lax vowels contrast in **all** phonetic environments, whereas English tense and lax vowels do not.

The vowel /ɛ:/, spelled ä

In order to discuss this vowel properly, we must first say something about its history. In modern German, referred to from a historical point of view as *New High German*, there is a regular alternation in the spelling system between the sounds spelled with umlauts (ä, ö, ü, äü) and the corresponding vowels without umlauts (a, o, u, au). This shows up typically in noun singulars and plurals, e.g. *Hand* - *Hände*, *Loch* - *Löcher*, *Buch* - *Bücher*, *Baum* - *Bäume*. These spellings correspond to regular alternations in the phonemic system between /u,y/, /ʊ,x/ for orthographic *u,ü*, /o,ø/, /ɔ,œ/ for orthographic *o,ö*, /aʊ,ɔɪ/ for orthographic *au,äu*, and, for orthographic *a,ä*, between /a,ɛ/ and /a/ and another vowel which is, for some speakers, /e/ and for others /ɛ:/. In earlier periods

⁵Moulton (1962:61).

of German the spelling system was different. There was a lack of symmetry. While there was a regular spelling alternation between *u* and *ü* and *o* and *ö*, the vowel which alternated with *a* was written *e*. The grammarians of the 16th to 18th centuries carried out a spelling reform in which all examples of orthographic *e* which could historically be traced back to *a* were rewritten with *ä*. That this exercise was not completely successful is indicated by the survival of *e* in the words *behende* "nimble; quick" (related to *Hand*) and *Eltern*, which, once one thinks about it, is obviously related to *alt* and its comparative *älter*. Occasionally words were newly written with *ä* which had never had any association with *a* at all, e.g. *Bär*.

The next stage of the process was that some people began to pronounce this new vowel in a different way, particularly when it was tense. This "erudite" pronunciation of *ä* has now been institutionalised to the point that the major pronouncing dictionaries of German prescribe /ɛ:/ whenever *ä* is written and is pronounced long, e.g. in *spät*, *Universität*, *fährst*, etc. In North Germany the distinction between /e/ and /ɛ:/ is usually ignored and /e/ is used throughout, so that *spät* is [ʃpɛ:t], *Universität* is [ʔuniverzi'tɛ:t], and *fährst* is [fɛ:ɣst], as opposed to the prescribed [ʃpɛ:t, [ʔuniverzi'tɛ:t] and [fɛ:ɣst]. North Germans use /ɛ:/ in formal or mock-formal speech and to indicate the difference between such pairs as *wehren* and *wären*, but in everyday informal speech the vowel is largely unused. In the South, on the other hand, there has always been a difference between /e/ and /ɛ:/, but it does not accord with the difference in the orthography. In the South *Leder* and *Leben*, which, according to the pronouncing dictionaries, are supposed to be [lɛ:dɐ] and [lɛ:bən], are often pronounced with /ɛ:/, and *zählen*, which was rewritten with *ä* because of its connection with *Zahl*, is regularly pronounced [tʃɛ:lən], despite the prescribed [tʃɛ:lən]. The reason for these southern pronunciations is that the vowel of *zählen* was always higher than the vowel of *Leder* and *Leben*, and that distinction has been maintained. In the North, the higher vowel of *zählen* and the lower vowel of *Leder* merged to /e/. Both areas, therefore, pronounce long *ä* in a way which is contrary to what is prescribed. This is typical of what happens when people start basing pronunciation on spelling rather than on history.

In the rest of this discussion, which is based on North German standard speech, I will include this vowel, but I will put it in () to indicate that it is marginal and is not used by all speakers.

The vowel [ɐ]

The vowel [ɐ] occurs only in unstressed syllables. In this respect it is like /ə/, but whereas /ə/ is a phoneme, [ɐ] can be shown to be the phonetic realisation of the phonemic sequence /ər/. This vowel occurs in alternation with phonetic [ər] in inflected forms, e.g. *bitter* ['bitɐ] vs. *bittere* ['bitərə], *ich wandere* ['vandərə], *du wanderst* ['vandɛst], *Lehrer* ['lɛ:rɐ], *Lehrerin* ['lɛ:rərɪn].

Let us start with the adjectives. Normally when *-e* /ə/ is added to an adjective stem the final sound of the stem either remains the same, e.g. *bunt* ['bʊnt], *bunte* ['bʊntə], or it is replaced, if a consonant, by its voiced counterpart, e.g. *lieb* ['li:p], *liebe* ['li:bə]. If the adjective ends in a vowel the stem remains the same and /ə/ is added directly to the other vowel, e.g. *roh* ['rɔ:], *rohe* ['rɔ:ə]. Yet, uniquely, if an adjective ends in [ɐ], that vowel is replaced by a sequence of a (different) vowel and a consonant, [ər], when the adjective ending is added. The simplest way to analyse this is to analyse [ɐ] as the phonetic realisation of phonemic /ər/ in these instances. This puts adjectives which end in [ɐ] in line with all other adjectives. Similar arguments can be put for verb forms and for feminine nouns derived from masculine nouns. Once we have decided to analyse one set of occurrences of [ɐ] as /ər/ on the grounds that [ɐ] alternates regularly with [ər], we can analyse **all** occurrences of [ɐ] as /ər/, even when there is no alternation, e.g. *Vater*, as long as there is no contrary evidence, and there is none.

Vowels in word-initial position

In North German standard speech word-initial vowels are always preceded by a glottal stop [ʔ]. The glottal stop occurs also in compound and derived words at word boundaries, e.g. *uralt* [ʔuːɔ̯ʔalt], *erinnern* [ʔɛŋʔmɛn]. Otherwise vowels are not preceded by glottal stops. This is obvious complementary distribution. Thus the simplest analysis is that every German vowel (except /ə/) has (at least) two allophones, one of which begins with glottal stop and which is used at word boundaries. The other allophone is used elsewhere.

Distributional Classes

Now that the **inventory** of German vowels has been settled, we can proceed to the **distribution**. We have seen that there is one vowel, /ə/, which occurs only in unstressed syllables. Other vowels occur both stressed and unstressed, but only /ə/ occurs only unstressed. It therefore forms a distributional class of its own.

The rest of the vowels of German can be divided into two groups. One group occurs freely at the ends of words, before other vowels and before consonants. The other group occurs only before consonants, i.e. the vowels of this group never end words and never occur before other vowels. Since the latter group must be followed by consonants, we will, following Moulton (1962), call them *checked* (German *gedeckt*) vowels. The group which can end words and occur before other vowels we will call *unchecked* (German *ungedeckt*).

The checked vowels number seven. They are presented in schematised format below, with the front vowels on the left, back vowels on the right. High, mid and low are indicated by vertical position. Examples are given to the right of the diagram. The contrast round ≠ unround has been ignored in this diagram.

i, y	u	bin, dünn	dumm
ɛ, œ	ɔ	denn, gönnt	von
	a	dann	

The checked vowels of Modern Standard German

The **checked** vowels are identical with the **lax** vowels.

The **unchecked** vowels are the tense vowels plus the three diphthongs. These are diagrammed below, and examples are given in similar format below to show them in their three possible positions of occurrence.

i, y	u		
e, ø	o		
(ɛ:)			ɔɪ
	ɑ	aɪ	aʊ

The unchecked vowels of Modern Standard German

Sie, früh	Schuh		
See, Bö	so		
(zäh)			Heu
	sah	Mai	Bau

The unchecked vowels in word final position

ziehen, frühe	Schuhe		
sehen, Höhe	hohe		
(säen)			scheuen
	sahen	Laien	bauen

The unchecked vowels before another vowel

sieht, bemüht	Flut		
seht, erhöht	Boot		
(spät)			scheut
	Draht	Leit	Haut

The unchecked vowels before a consonant