Introduction

When you are learning how to pronounce vowels of a new language, it is useful to keep a number of points in mind. As with consonants, you will obviously want to be aware of the parts of the vocal tract that are involved in making a particular vowel. In addition, the narrowness of the passage through which the air exits the mouth is important. We saw that by varying the degree of narrowness of the air passage between, for example, the tongue and the hard palate, we can create different consonants. The same is true for vowels.

It is also important to consider where the narrowing occurs for vowels, as well as whether the air exits just the mouth or exits the nose as well. Also, just as consonants can be long or short, we also want to be aware of how long a vowel is and whether the quality of the vowel changes during its production. Finally, the shape of the lips—that is, whether the lips are protruded to form a small ‘o’ or are spread apart—is also relevant, perhaps more so than for consonants. In this chapter we will look at all these aspects of making a vowel.

In order to make a vowel, you should keep several general points in mind, as shown in the box at the top of page 52. Each of these questions will be addressed below.

Parts of the Vocal Tract
Involved in Making Vowels

Since all speech sounds are made by filtering the air as it passes through the mouth or
Making a Vowel Sound

- What parts of the vocal tract are involved in making the vowel?
- Where in the vocal tract is the air passage narrowed?
- How narrow is the air passage?
- What is the shape of the lips?
- Does the quality of the vowel change from start to finish?
- Does air flow through the nose as well as through the mouth?
- How long is the vowel?

nasal cavity, you should not be surprised to learn that similar parts of the vocal tract are used to create consonants and vowels. Yet, vowels differ from consonants in a number of ways. For example, we generally do not use the tip of the tongue to make a vowel. For vowels, it is movements involving the middle and back of the tongue that are especially important; together these two areas are often referred to as the tongue body. In addition, air flow is never completely obstructed in the vocal tract as it is for some consonants (stops). Despite this, vowels can be differentiated by more degrees of narrowness than consonants are. Because of these differences, it is worthwhile to have a closer look at the production of vowels in English and other languages.

Places Where the Air Passage Is Narrowed for Vowels

In this section we discuss an important function of the tongue: its back-and-forth movement in the mouth.

There are three basic positions used by speakers of most languages to make vowels. The first involves bunching the tongue toward the front of your mouth, as in [i] (beet).

Exercise 1: Horizontal Tongue Movement

To get a feel for your tongue moving back and forth, say the vowel in [æ:] as in cat; then say the vowel in [ɑ] as in cot. Repeat a number of times, concentrating on where in your mouth the tongue body is. It may help to look in a mirror while you are doing this.

You can also use your index finger to sense the movement: touch the tip of your index finger to the front of your tongue when you say the vowel in cat; now, make the vowel in cot without moving your finger. Your tongue should be moving away from your finger, toward the back of your mouth, when you say the vowel in cot.
This may be more noticeable when you contrast it with the pronunciation of [u] (boat), although you should ignore any differences in the shape of your lips. Vowels that are made with the tongue bunched forward are called front vowels.

(1) **Front vowels in American English**

<table>
<thead>
<tr>
<th>Sound</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i]</td>
<td>beet</td>
</tr>
<tr>
<td>[ɪ]</td>
<td>bit</td>
</tr>
<tr>
<td>[eɪ]</td>
<td>bait</td>
</tr>
<tr>
<td>[ɛ]</td>
<td>bet</td>
</tr>
<tr>
<td>[æ]</td>
<td>bat</td>
</tr>
</tbody>
</table>

In the second position, the tongue is pulled toward the back of the mouth; vowels made in this way are called back vowels. Comparing again the front vowel [i] (beet) with the back vowel [u] (boat), notice that when you say [u], the back of your tongue is pulled back so that it almost touches the back of your throat. The front-back distinction is very important and is used in virtually all languages.

(2) **Back vowels in American English**

<table>
<thead>
<tr>
<th>Sound</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>[u]</td>
<td>cool</td>
</tr>
<tr>
<td>[u]</td>
<td>could</td>
</tr>
<tr>
<td>[ou]</td>
<td>coat</td>
</tr>
<tr>
<td>[ɑ]</td>
<td>caught1</td>
</tr>
<tr>
<td>[ɑ]</td>
<td>cot</td>
</tr>
</tbody>
</table>

In the third position, the tongue is neither bunched up at the front of the mouth nor pulled all the way back, but rather it is positioned in between the two. This is the case in English for the sound that occurs in the word but; vowels with this third tongue position are called central vowels.

---

**Exercise 2: Front, Central, and Back Vowels**

Compare the pronunciation of front, central, and back vowels in English. To do this, say just the vowels in the following words slowly one after the other: bait [eɪ], but [ʌ], boat [ou]. Try to feel where your tongue is for the front vowel [eɪ], the central vowel [ʌ] and the back vowel [ou]. Practice this until you are able to feel your tongue moving back as you pronounce the three vowels. (Note that the vowel in but is sometimes written as [ə], a vowel referred to by linguists as 'schwa.')

---

1. Not all speakers of American English make a distinction between the vowels in caught and cot. For those that do not, the vowel [ɑ] is generally used. See the discussion in the next section.
Sounding Like a Native Speaker

Central vowels in American English

\[ \text{[i]} \text{ or } \text{[u]} \text{ cut} \]

Taking what you know about tongue placement in English, consider the front-central-back distinction among some vowels in the Korean language, as shown by the three forms in (4). English has [i] (beet) and [u] (boot), but not the central vowel [i].

Korean

<table>
<thead>
<tr>
<th>Front</th>
<th>Central</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i] [kil] ‘road’</td>
<td>[i] [kil] ‘letters’</td>
<td>[u] [kul] ‘oyster’</td>
</tr>
</tbody>
</table>

In both languages, the vowel [u] is pronounced with the lips protruded. Similarly, in both English and Korean, the vowel [i] is made with the lips spread, not protruded. Korean obviously differs from English in that it also has a central vowel [i] where the tongue body is positioned between where it would be for [u] and [i]. You can come fairly close to making a Korean [i] by drawing on your knowledge of English vowels. Start by making [i] (beet). Now, without protruding your lips, draw your tongue back toward its position for [u] (boot), though not completely. By doing this, you are approximating the pronunciation of the central vowel [i] which occurs not only in Korean but in Chinese, Turkish, and many other languages.

Narrowness of the Air Passage

We turn now to the narrowness of the air passage. The different degrees of narrowness that are used to distinguish vowels are generally referred to as vowel height distinctions. To be more precise, it is the height of the highest part of the tongue with respect to the roof of the mouth that is relevant. The higher the tongue, the narrower the air passage.

To get a feel for what we mean by the height of the tongue, say the vowel in the word beet and then the vowel in bat. Repeat several times, focusing on the position of the middle of your tongue in relation to the roof of your mouth. Notice that for the vowel in beet, your tongue is very high in your mouth, almost touching the hard palate. If it were any higher, you would be making a fricative or stop consonant. For the vowel in bat, on the other hand, the space between your palate and tongue is much greater. Your jaw will be much lower in this case as well. This is why doctors ask us to say “aaah” and not “eeeh”!

The image in Figure 4.1 shows X-ray tracings of the tongue position of an English speaker saying the vowels [i] (beet), [u] (boot), [æ] (bat), and [ɑ] (bottle; bought). Look for the narrowest passage between the tongue and the roof of the mouth in each case; it is closer to the middle of the mouth for [i] and closer to the back of the mouth for the other three vowels. Compare the very different tongue heights for the vowels you were just saying: [i] (beet) and [æ] (bat). Of all of the vowels illustrated, [i] and [u] have the highest tongue positions and so are referred to as high vowels. The vowels [æ] and [ɑ] are called low vowels because the tongue is low in the mouth.
There are five different degrees of narrowness (or vowel height) used in American English, illustrated by the front vowel sounds in (5). They can be described on a scale from high to mid to low, with the height of the two intermediate vowels labeled “higher mid” and “lower mid.”

(5) **Vowel height in American English front vowels**

<table>
<thead>
<tr>
<th>Height</th>
<th>Symbol</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>[i]</td>
<td>beet</td>
</tr>
<tr>
<td>Higher mid</td>
<td>[ɪ]</td>
<td>bit</td>
</tr>
<tr>
<td>Mid</td>
<td>[eɪ]</td>
<td>bait</td>
</tr>
<tr>
<td>Lower mid</td>
<td>[ɛ]</td>
<td>bet</td>
</tr>
<tr>
<td>Low</td>
<td>[æ]</td>
<td>bat</td>
</tr>
</tbody>
</table>

Practice feeling the height differences among the vowels in (5). Begin by pronouncing the vowel in *beet* by itself, without the two consonants. Notice that the tongue is very high in your mouth, close to the hard palate. Add a small bit of space between the tongue and the palate while keeping everything else in the same position. By doing this, you will be making the vowel in *bit*. Lower the tongue a bit more and you will have the vowel in *bait*. Lower it one more step and you will be making the vowel in *bet*. Now lower the tongue even further, drop the jaw, and you will have the vowel in *bat*. Try this a few times to familiarize yourself with the feeling of your tongue moving closer to and further away from the roof of your mouth.

American English also uses different vowel heights to distinguish back vowels, as shown in (6).

(6) **Vowel height in American English back vowels**

<table>
<thead>
<tr>
<th>Height</th>
<th>Symbol</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>[u]</td>
<td>cool</td>
</tr>
</tbody>
</table>
Higher mid  [u]   could
Mid        [ou]   coat
Lower mid  [ɔ]    caught
Low        [a]    cot

As noted earlier, not all speakers of American English make use of five height distinctions for back vowels. For many speakers, the vowels [ɔ] and [a] are not differentiated. Instead, words like *cot* and *caught* are both pronounced as [kat]. Determine for yourself whether or not you distinguish between these two vowels.

English is rather uncommon in having five vowel heights, given that most languages have three or four. This is good news for people who already know English and are learning another language. The odds are that you will already be familiar with the heights of the vowels in the new language. This means that producing the vowels and hearing differences among them will probably not be as difficult as it would be if you were going from, for example, a three-height to a five-height system.

Many languages have three vowel heights, including languages such as Arabic, Bulgarian, Greek, Hawaiian, Hebrew, Hungarian, Japanese, Korean, Latin, Farsi, Serbo-Croatian, Spanish, Swahili, Turkish, and Yiddish. In Spanish, Hawaiian, and Swahili, for example, the three back vowels are [u], [o], and [ɔ].

A number of other languages have four vowel heights, including Dutch, French, German, Italian, Polish, Russian, and Swedish. Dutch, for example, has the back vowels [u], [o], [ɔ], and [a].

### The Shape of the Lips

We saw in the last chapter that some consonants are made with the lips protruded, as in [w] *win*. Lip protrusion is often referred to as lip rounding because the lips form a small circle when protruded. Rounded vowels are quite common in languages. English, for example, has a number of rounded vowels, including [u] *boot*, [ou] *booth*, and, in some dialects, [ɔ] *bought*. While all the rounded vowels in English are also back, in other languages front vowels can be rounded as well, for example, French, German, Hungarian, Korean, Swedish, and Turkish, to name a few.

French, for example, has an especially rich inventory of front rounded vowels, as shown in (7).

(7) **French front rounded vowels**

<table>
<thead>
<tr>
<th>High front rounded</th>
<th>[y]</th>
<th>pu  [py] ‘could’</th>
<th>lu  [ly] ‘read’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid front rounded</td>
<td>[ø]</td>
<td>peu [pø] ‘little’</td>
<td>le  [lø] ‘the’</td>
</tr>
<tr>
<td>Lower mid front rounded</td>
<td>[œ]</td>
<td>peur [pœ] ‘fear’</td>
<td>leur [lœr] ‘their’</td>
</tr>
</tbody>
</table>

Making front rounded vowels is not difficult if you start with vowels that you are familiar with. Picking up from our discussion above, begin by making the vowel [i] as in
beet. Now protrude your lips as you would if you were producing [u] (boat), remembering to keep your tongue near the front of your mouth. You have just made the high front rounded vowel [y]! Now practice it a number of times to give your muscles a chance to remember how they are positioned when you make this vowel.

Let’s try another. To make the front mid rounded vowel [ø], start by making the English vowel [æ], as in bait. Now protrude your lips, again without moving your tongue. This is the vowel in French words like [pœ] peu ‘little’ and [lø] le ‘the.’

To produce the remaining French front rounded vowel, that is, the lower mid front rounded vowel [œ], begin with the lower mid front vowel [ɛ], as in English bet. Once more, protrude your lips. You have now made the vowel that occurs in words like [pœr] peur ‘fear’ and [lœr] leur ‘their.’ Congratulations!

Now practice pronouncing all three vowels one after another: [y], [ø], [œ].

Once again we have illustrated how you can make unfamiliar sounds from another language by drawing on the knowledge that you already have from your own language.

## Changing Vowel Quality from Start to Finish: Diphthongs

Most of the vowels that we have discussed so far are similar in that the quality of the vowel stays the same from beginning to end. For instance, the vowel [i] in bee is consistently pronounced as [i] from when it starts after the consonant [b] to when it ends. Vowels of this type are called **monophthongs**. Not all vowels have this property, however. The vowel [ɔɪ] in the word boy for example, begins as a mid back rounded vowel [o] but ends up as a higher mid front unrounded vowel [i]. A vowel of this type is called a **diphthong**: a vowel that starts out with one quality and ends up with another quality.

The full set of diphthongs in English is shown below in (8), including two that we have already seen: [ɛɪ] (bait) and [ɔʊ] (boat). Note that the change in quality is most detectable when the diphthong occurs at the end of a word, since in this position it is fairly long, allowing the end of the vowel to be more fully produced: compare bait vs. bay.

(8) **English diphthongs**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[æu]</td>
<td>cow, trounce</td>
</tr>
<tr>
<td>[ɔʊ]</td>
<td>go, sew, toad</td>
</tr>
<tr>
<td>[aɪ]</td>
<td>buy, bide</td>
</tr>
<tr>
<td>[ɔɪ]</td>
<td>soy, boy</td>
</tr>
<tr>
<td>[ɛɪ]</td>
<td>ray, say</td>
</tr>
</tbody>
</table>

Many languages do not have diphthongs, only monophthongs, including Arabic, Bulgarian, Ewe, Parisian French, Greek, German, Hawaiian, Hebrew, Hungarian, Italian, Japanese, Navaho, Spanish, Swahili, Zulu, and many others. In fact, all languages have monophthongs, while only some, like English, have diphthongs.
Air Flow through the Mouth and Nose

In addition to the topics above, another point to keep in mind when producing vowels is whether the vowel is nasal or oral. Just as we saw for consonants, whether the air exits the nose or the mouth can be meaningful. If the air exits only the mouth, we have an oral vowel. If it also exits the nose, the vowel is nasal.

The vowels of English are all basically oral. That is, we do not use the distinction between nasality and orality in vowels to change the meaning of words, as we do with vowel height, e.g. ([i] *beet* vs. [i] *bit*). This means that there are no two words in English that differ solely on the basis of whether the vowel is nasal or oral. Yet many languages do use this distinction.

Recall that to make a nasal consonant, the velum is lowered so that air can exit the nose. This is the case with consonants like [m] *some*, [n] *sung* and [ŋ] *sung*. Not surprisingly, nasal vowels are also made by lowering the velum.

Try to make a nasalized [a] (the oral [a] occurs in words like *father*). Start by pronouncing the sound [a], followed by [ŋ], as in *song*. Notice that the back of your tongue is touching the roof of your mouth in order to make the consonant. To remove the consonantal articulation but keep the nasality, lower the back of your tongue slightly so that it is no longer touching the top of your mouth. You should still be making a nasal sound, and if you are, then your velum is in a lowered position. You might even be able to feel air coming out of your nose. Now try to make just the vowel [a] with the velum lowered, that is, the nasal vowel [ã]. (A tilde over a vowel indicates that the vowel is nasal.) Practice this several times to get a sense of what a nasal vowel feels and sounds like.

As we mentioned above, in some languages the only difference between two words can be whether the vowel is nasal or oral, and so the meaning of a word depends on this quality of the vowel. In Polish, for example, there are two mid nasal vowels, spelled...
‘ę’ [ě] and ‘ą’ [ą]. The latter differentiates words that mean ‘I’ (which contains an oral vowel) and ‘she’ (which contains a nasal vowel), as shown in (9). The consonant [j], the height of the vowel, and the position of the tongue body and lips are the same.

(9) Polish oral and nasal lower mid back rounded vowels

[jo] ‘I, me’
[jɔ] ‘she, her’

In Polish, nasality on a vowel is “spelled” with a diacritic under the vowel, i.e. ‘ę’ and ‘ą.’ Another common way to denote nasality in spelling is to write a nasal consonant after the vowel, as is done in French and Portuguese. In French, for example, the word for good is spelled bon yet pronounced as [bɔ̃]; the ‘n’ in the spelling is not pronounced as a consonant, but instead indicates that the preceding vowel is nasal. As discussed in Chapter 6, a common mistake made by English speakers is to pronounce the ‘n’ as the consonant [n], rather than as nasalization on the vowel. Understanding the spelling conventions of the language that you are learning will help you to avoid this kind of error.

Length of the Vowel

An additional property of vowels that may be important is vowel length. In some languages, the amount of time that you hold the pronunciation of a vowel can be used to distinguish the meaning of words. Examples from the Turkish language, shown in (10), illustrate that in some words it is only the length of the vowel that differentiates words (a colon : after a vowel indicates that the vowel is longer than the same vowel without the colon). For example, the words for ‘beware’ and ‘quiet’ are identical, except that the first word [sakin] has a short [a] while the second word [saːkin] has a long vowel [aː].

(10) Turkish short and long vowels

<table>
<thead>
<tr>
<th>Shorter Duration</th>
<th>Longer Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>[sakin] ‘beware’</td>
<td>[saːkin] ‘quiet’</td>
</tr>
<tr>
<td>[meme] ‘breast’</td>
<td>[meːmur] ‘official’</td>
</tr>
<tr>
<td>[iman] ‘faith’</td>
<td>[iːman] ‘imam’</td>
</tr>
<tr>
<td>[surat] ‘face’</td>
<td>[sʊːret] ‘manner’</td>
</tr>
</tbody>
</table>

English vowels can also differ in duration, but these differences do not change the meaning of a word as they do in Turkish. Rather, the duration of the vowel is completely predictable from its context. A vowel is pronounced with a shorter duration if it comes before a voiceless consonant, such as [t, p, k, s, . . .], as in the word beat. A vowel is longer when it comes before a voiced consonant, such as [d, b, g, z, . . .], as in bead. Compare the vowel [i] in beat to the one in bead. Can you tell that the second one is longer? Now compare these two to the vowel [i] in bee. It should sound even longer, because in English the duration of a vowel is longest when it comes at the end of a word. A vowel
in English, then, is short before a voiceless consonant, longer before a voiced consonant, and longest at the end of a word. Since we can predict the relative length of a vowel by knowing what, if anything, follows it in a word, vowel length in English is not distinctive. On the other hand, it is distinctive in Turkish, as we saw in (10).

Summary

In this section we discussed six areas involved in the production of vowels that may be important to you as you learn new vowels.

(11) **Dimensions of difference for vowels**
- the height of the vowel: high, higher mid, mid, lower mid, low
- the horizontal position of the tongue body: front, central, back
- the position of the lips: rounded, unrounded
- whether the vowel is a monophthong or a diphthong
- whether the vowel is oral or nasal
- whether the vowel is long or short

These are the most common properties associated with vowels, and if you are aware of these, they will take you a long way in learning how to produce the sounds of another language.

Being familiar with these aspects of vowels, as well as with the additional components that we discussed in the previous chapter for consonants, should enable you to produce, with practice, almost any speech sound, even those very unusual sounds that may occur in only a few languages. Remember that when you are learning to make a new sound, it can be helpful to start from a sound that you already know. Recall that this was our strategy for producing the front rounded vowel [y]; we started from the English vowel [i] *beet* and added lip rounding, similar to English [u] *boot*. If you are unsure about how the new sound is produced and you are studying in a formal language learning setting, ask your instructor to describe where in the mouth and how the sound is made. Alternatively, you could ask a native speaker. Watch as the person pronounces the sound, and listen carefully. Then imitate the best you can, asking him for feedback on your pronunciation. Once you have it, there is only one thing left to do: PRACTICE, PRACTICE, PRACTICE! There is no substitute in language learning for practice.
Additional Exercise: Comparing Vowels

This exercise is similar to the one for consonants at the end of the previous chapter. The goal is to help you better understand how the vowels in a language that you are learning differ from those in English.

1. On the inside back cover of this book and the page opposite it, you will find charts with symbols for vowels in English and other languages.
   - Make a copy of the English vowel charts (or draw your own). Note that there is one for monophthongs and one for diphthongs.
   - Taking information that you have gathered from your language book, your instructor, the web, or other sources, draw a triangle around any English vowel that also occurs in the language you are learning. Take care to determine whether the vowels of your new language are monophthongal or diphthongal. Add any vowels from your new language that do not occur in English.
   - Now compare the vowels in the two languages:
     » What differences in the two systems do you notice? If there are vowels in your new language that do not occur in English, in what ways are they similar to or different from English vowels?
     » What aspect of pronouncing the new vowels do you find particularly challenging? How can you draw on your knowledge of English vowels to help overcome the challenges?

Reference