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# Support Materials: The Sounds of Language

# The Sounds of Language

These materials are designed to get you to think about speech sounds more deeply than you might be used to. There are some practical exercises within these materials. They are quite simple to do but doing them is key to getting the most from these materials.

## The vocal organs

The **vocal organs** are those parts of the body which are involved in the production of speech sounds. Examples include the **lips**, **teeth**, **palate**, **larynx** ('voice box') and **tongue**.

We will do a simple exercise to see what you can notice about what some of the vocal organs are doing when you speak. Say the words "loop" and "leap" to yourself over and over again: about 5 times should do for now. (You can do this silently or very quietly if you like – it may sound strange but this often helps us notice what we do when we speak.) Now say the words again, about five times each, this time focussing on what happens when you produce the first ('l') sound in each word.

You will almost certainly notice that in each case the tip of your tongue is raised up so that it touches the roof of your mouth just behind your upper teeth. The special name for this part of the roof of your mouth is the **alveolar ridge** (alveolar = al-vee-OH-luh). You might also notice that the sides of your tongue are lowered in each case. Because the sides of the tongue are lowered, we call this a **lateral** sound. Repeat your productions to check you can feel all this before moving on.

When you produced "loop" and "leap" you will almost certainly have noticed an important difference between the 'l' sounds. Say the words to yourself again a few times while paying attention to the shape of your lips at the start of the two words. Your lips will almost certainly be rounded in an 'oo'-like shape for the 'l' at the start of "loop", and spread out like you are smiling for the 'l' at the start of "leap". We can therefore describe the initial sound in "leap" as **spread** and "loop" as **rounded**, respectively.

## Consonants and vowels

When we describe speech sounds in languages we typically talk in terms of consonants and vowels. However, these terms do not have the meaning that you might be used to and do not relate in any straightforward way to letters of any alphabet. **Consonants** are sounds where one vocal organ gets close to or makes contact with another in making the sound. The sounds at the start and end of "loop" and "leap" are all consonants. In the case of the initial sounds, the tongue tip makes contact with the alveolar ridge; for the final sounds, the upper and lower lips come completely together and make a **plosive** sound where air is completely stopped from coming out of the mouth. Since both lips are involved, we say that this is a **bilabial plosive**.

**Vowels** are sounds produced without the vocal organs getting as close together as they do for consonants. Say the word "leap" again to yourself a few times, focussing on the sound in the middle (represented by 'ea' in the spelling). That sound is a vowel. You should notice that the front of the **tongue** – the bit behind the tongue tip – is close to the roof of the mouth. Because the tongue gets close to the roof of the mouth we say this is a **close** vowel. (The opposite would be an **open** vowel, as in a word like "lap".) You should also feel that the tongue is pushed forward towards the teeth for the vowel in "leap". We therefore also say this is a **front** vowel. And we know from our earlier experiment that this is produced with the lips spread. So we can bring this all together to say this is *a close front vowel produced with spread lips*. Say the word "loop" to yourself until you feel you understand why the vowel in that word is described as a *close **back** vowel produced with rounded lips*.

To help you 'see' the different positions which you should be able to feel when you produce the vowels in "leap" and "loop", look carefully at the pictures below. They are taken from magnetic resonance imaging (MRI) videos on the Seeing Speech website: www.seeingspeech.ac.uk. The picture on the left shows a speaker's vocal organs while producing a close front vowel like that in "leap"; the picture on the right shows a speaker's vocal organs while producing a close back vowel like that in "loop".

## Transcription

Anyone working with speech sounds in any detail will soon find themselves engaged in **transcription**: the act of preparing an accurate written record of the sounds a speaker has produced. Everyday alphabets do not offer us nearly enough distinct characters to let us note down the different speech sounds we can observe. For example, the Latin or Roman alphabet contains 26 characters, but most varieties of English have about 40 distinct sounds or **phonemes**. We might want to do quite a basic transcription where we have symbols for these distinct sounds: a **phonemic transcription**. You can see a version of phonemic transcription in good dictionaries, e.g. the *Concise Oxford English Dictionary*. For phonemic transcription we can use the symbols set out on this page at the University of Sheffield which also lets you hear the sounds which are transcribed:

http://learnipa.group.shef.ac.uk/english-phonemes.html

If we want a transcription which captures even more of the details we can notice when we listen carefully – such as when we observed the different lip positions in "loop" and "leap" – then we can look to the alphabet of the International Phonetic Association (IPA). This alphabet is designed to allow us to make very detailed transcriptions of speech sounds across all languages (**phonetic transcription**). You can see all the symbols on the IPA and watch video illustrations on this page at the University of Sheffield:

http://learnipa.group.shef.ac.uk/IPAChart/index.html

## Phonetics and phonology

Within linguistics there are two areas which deal specifically with speech sounds: **phonetics** and **phonology.** Both are equally important, and closely related, but look at speech sounds in different ways. Phonetics is concerned with how speech sounds are produced, perceived and analysed. You were engaged in a phonetic analysis when comparing the sounds in "loop" and "leap". You could, with a little effort, contort you vocal organs in such a way to produce a rounded 'l' at the start of 'leap' and a spread 'l' at the start of 'loop'. Such productions might sound (and look) a little unnatural but the meaning of the words would not be changed: someone hearing your productions would still know which word you intended.

This is different from, say, the sounds you get at the start of the words “fun” and “sun”: swapping one of those sounds for the other leads to a difference in meaning (creates different words). Phonology is concerned with how sounds work in systems to create meaning.

## Applications

Speech sounds are analysed for many different reasons, including:

• to help someone with their own speech production (e.g. l**anguage learning**, or **speech therapy**);

• as part of studies of how the sounds of languages change over time (**historical linguistics**), or how sounds are connected to social factors such as age, gender, regional origin, ethnicity, and socioeconomic status (**sociolinguistics**);

• in **forensic analysis** where the analysis of speech sounds is used to help in solving crimes;

• to help with **speech synthesis** (getting machines to speak) and **speech recognition** (getting machines to work out what someone has said).