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Tone and tone languages

We have seen in Chapter 2 that we are able to control the **pitch** of our voice. In this chapter we look at one of the most important functions of this pitch control. We will begin with a simple example. In the following examples, the words are given in phonetic transcription and each has a diagram of the pitch that is produced, with the upper line representing the highest pitch of the speaker, and the lower line the lowest pitch. We will not use square brackets for these examples, for the sake of clarity. The words are from Kono (Sierra Leone).

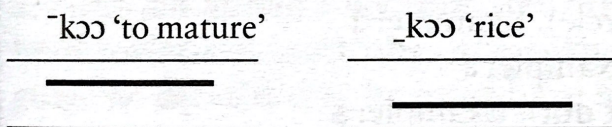


FIGURE 4.1 *Example of pitch level distinguishing a word*

Note that both words contain exactly the same segments, but they are different in pitch. In some cases it is the pitch level that distinguishes a word, while in others it is a pitch movement. We refer to these characteristics of pitch as **tone**. Each word in the above example has a distinctive tone. One of the interesting facts about languages is that some use tone in this distinctive way, while others (including most European languages) do not. Languages which use tone distinctively are called **tone languages**. It is probably true to say that the majority of the world's population speaks a tone language, so it is surprising how little importance is given to this aspect of speech in books on phonetics. Perhaps this shows that the subject is dominated by speakers of European languages. We find tone languages in South-East Asia (for example,

Chinese, Thai, and Vietnamese), in much of south and west Africa (for example, Hausa, Yoruba, and Zulu), and in indigenous languages of America (for example, Mixteco, Zapotec, Navajo).

Lexical and grammatical use of tone

Tone works in different ways in different languages. The easiest to explain is what we can call *lexical tone*, where the meaning of a word (as it would appear in a dictionary) is determined by its tone. So in Vietnamese, whose writing system is based on the Roman alphabet, vowels are represented with additional marks which indicate one of the language's six tones. Two of the tones, known as 'broken' tones, are (in the Northern dialect) accompanied by glottalization (rather like a rapid glottal stop in the middle of the **syllable**). A Vietnamese dictionary has to list the different words with their tones. The marks, and the tones they represent, are as follows:

- 1 Mid-level (no mark). Example: a
- 2 Low falling (grave accent). Example: à
- 3 High rising (acute accent). Example: á
- 4 Low, rising after dip (circle). Example: â
- 5 High 'broken' (tilde). Example: ã
- 6 Low 'broken' (subscript dot). Example: ă

In some languages, tone may function as a way of showing different aspects of grammar. In Kono, the following sentences differ only in the use of high and low tones (shown by the tone-marks placed before each syllable in the transcription):

˩_a ˩_a ˩_do ˩_ma ˩_ko 'Wash his shirt'

˩_a ˩_a ˩_do ˩_ma ˩_ko 'He has washed a shirt'

Tone levels and contours

In the phonetic study of tone, we are not just concerned with the meaning of tones, but with the physical nature of their sounds. In some tone languages, the most important thing about the tones is the difference between tone levels: whether the pitch is high or low. Some languages distinguish only high and low, while others

may have as many as four different levels. Each speaker will have their own individual pitch level for high and low, and for the tones in between, so the important thing is the difference between the tones rather than the exact pitch of the tone. In other languages, however, the important difference is between the shapes of the tones rather than the levels—tones can have rising pitch, falling pitch, falling–rising, or rising–falling, as well as level. It has been claimed for a long time that there is a fundamental difference between these two types of tone language (they are sometimes called *register* and *contour* tone languages), but there are many cases where it is difficult to decide which of the two types a language belongs to, so the distinction does not seem to be very useful.

Tones and context

Most speakers who do not speak a tone language would find it relatively easy to study tone if it were not for the fact that tones tend to vary in ways that are very difficult to predict, according to the context in which they occur. The story is told of a missionary who felt he had a vocation to work in West Africa, but when he discovered the difficulty of learning the tones of the local language he decided that he must have made a mistake in hearing the call from the Lord. Even if one can successfully recognize the individual tones of a tone language in words spoken in isolation, the tonal characteristics of those words may become very different when they occur in connected speech. Around two thousand years ago, Sanskrit grammarians in India made detailed studies of the effects of context on speech sounds, and gave the term **sandhi** to these effects. In *tonal sandhi*, a tone is modified by the tones of neighbouring syllables. An example is found in Mandarin Chinese, in which the tones are numbered as follows:

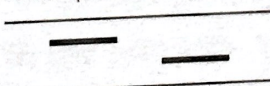
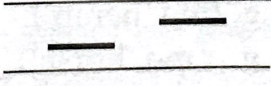
- 1 high level (e.g. ˉma ‘mother’)
- 2 high rising (e.g. /ma ‘hemp’)
- 3 falling-rising (e.g. ˇma ‘horse’)
- 4 high falling (e.g. \ma ‘scold’)

However, when a syllable carrying tone 3 is followed by another tone 3 syllable, the first syllable’s tone changes to tone 2. When a

tone 2 syllable is preceded by a tone 1 or tone 2, and is followed by a stressed syllable, it becomes a tone 1. This does not make life any easier for someone learning Chinese. To add to the complexity, there are other effects such as **downdrift**, where, as an utterance goes on, the tones in the utterance become gradually lower and lower until the speaker reaches the end of a sentence, or pauses for breath. This means that a low tone found at the beginning of an utterance might have the same pitch as a high tone syllable at the end of the utterance. There is yet another effect found, different from downdrift, which is **downstep**. In this case, a high tone when it occurs on a syllable between other tone-bearing syllables is pronounced on a lower pitch than it would have in isolation—this could be regarded as a special case of tonal sandhi.

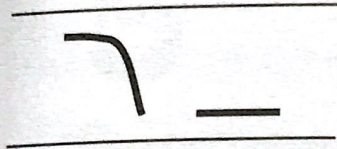
Tones and pitch-accents

Nobody has ever claimed that English is a tone language. However, pitch and pitch movements play an important role in English and similar languages in marking out certain syllables as distinctive and important. If you say the word 'important' on its own, you will probably notice that on the middle syllable the pitch of your voice steps up from the pitch of the first syllable, then glides down to the lower pitch of the final syllable. This distinctive pitch movement is sometimes known as **accent**, and the middle syllable can be said to be accented. It is not always easy to distinguish this function of pitch from the tonal contrasts that we have been looking at earlier in this chapter. In a number of languages which are not normally thought of as tone languages it is possible to find pairs of words which really seem to be distinguished from each other by pitch characteristics. One example is the following pair of Japanese words.

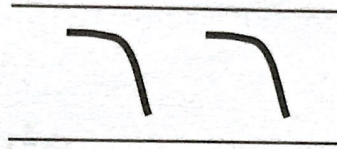
hási (meaning 'chopstick')	hasí (meaning 'bridge')
	

As the pitch diagrams show, these are distinguished by whether the pitch moves from high to low (as in the first word) or from low to high. Here is an example from Swedish:

anden ('duck')



anden ('spirit')



These are distinguished by the fact that in one, the pitch falls from high to low on the first syllable and remains low on the second, while in the other the pitch of each syllable falls from high to low. Similar examples can be found in Serbo-Croat.

In a tone language, pitch variation is used on practically all the syllables or words of the language, but in the cases just mentioned, only a limited number of words are distinguished by pitch. To avoid having to class Japanese, Swedish, Norwegian, and Serbo-Croat as tone languages, we say that they are pitch-accent languages, and that certain words are distinguished by pitch-accents.