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## 10 Stress in simple words

### 10.1 The nature of stress

🔊 AU10 (CD 2), Ex 1

Stress has been mentioned several times already in this course without an explanation of what the word means. The nature of stress is simple enough: practically everyone would agree that the first syllable of words like ‘father’, ‘open’, ‘camera’ is stressed, that the middle syllable is stressed in ‘potato’, ‘apartment’, ‘relation’, and that the final syllable is stressed in ‘about’, ‘receive’, ‘perhaps’. Also, most people feel they have some sort of idea of what the difference is between stressed and unstressed syllables, although they might explain it in different ways.

We will mark a stressed syllable in transcription by placing a small vertical line (ˈ) high up, just before the syllable it relates to; the words quoted above will thus be transcribed as follows:

ˈfɑːðə	pəˈteɪtəʊ	əˈbaʊt
ˈəʊpən	əˈpɑːtmənt	rɪˈsɪv
ˈkæmfrə	rɪˈleɪʃn	pəˈhæps

What are the characteristics of stressed syllables that enable us to identify them? It is important to understand that there are two different ways of approaching this question. One is to consider what the speaker does in producing stressed syllables and the other is to consider what characteristics of sound make a syllable seem to a listener to be stressed. In other words, we can study stress from the points of view of **production** and of **perception**; the two are obviously closely related, but are not identical. The production of stress is generally believed to depend on the speaker using more muscular energy than is used for unstressed syllables. Measuring muscular effort is difficult, but it seems possible, according to experimental studies, that when we produce stressed syllables, the muscles that we use to expel air from the lungs are often more active, producing higher subglottal pressure. It seems probable that similar things happen with muscles in other parts of our vocal apparatus.

Many experiments have been carried out on the perception of stress, and it is clear that many different sound characteristics are important in making a syllable recognisably stressed. From the perceptual point of view, all stressed syllables have one characteristic in common, and that is **prominence**. Stressed syllables are recognised as stressed because they

are more prominent than unstressed syllables. What makes a syllable prominent? At least four different factors are important:

- i) Most people seem to feel that stressed syllables are **louder** than unstressed syllables; in other words, loudness is a component of prominence. In a sequence of identical syllables (e.g. ba:ba:ba:ba:), if one syllable is made louder than the others, it will be heard as stressed. However, it is important to realise that it is very difficult for a speaker to make a syllable louder without changing other characteristics of the syllable such as those explained below (ii–iv); if one literally changes *only* the loudness, the perceptual effect is not very strong.
- ii) The **length** of syllables has an important part to play in prominence. If one of the syllables in our “nonsense word” ba:ba:ba:ba: is made longer than the others, there is quite a strong tendency for that syllable to be heard as stressed.
- iii) Every voiced syllable is said on some **pitch**; pitch in speech is closely related to the frequency of vibration of the vocal folds and to the musical notion of low- and high-pitched notes. It is essentially a *perceptual* characteristic of speech. If one syllable of our “nonsense word” is said with a pitch that is noticeably different from that of the others, this will have a strong tendency to produce the effect of prominence. For example, if all syllables are said with low pitch except for one said with high pitch, then the high-pitched syllable will be heard as stressed and the others as unstressed. To place some **movement** of pitch (e.g. rising or falling) on a syllable is even more effective in making it sound prominent.
- iv) A syllable will tend to be prominent if it contains a vowel that is different in **quality** from neighbouring vowels. If we change one of the vowels in our “nonsense word” (e.g. ba:bi:ba:ba:) the “odd” syllable bi: will tend to be heard as stressed. This effect is not very powerful, but there is one particular way in which it is relevant in English: the previous chapter explained how the most frequently encountered vowels in weak syllables are ə, ɪ, i, u (syllabic consonants are also common). We can look on stressed syllables as occurring against a “background” of these weak syllables, so that their prominence is increased by contrast with these background qualities.

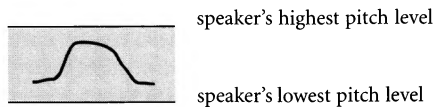
Prominence, then, is produced by four main factors: (i) loudness, (ii) length, (iii) pitch and (iv) quality. Generally these four factors work together in combination, although syllables may sometimes be made prominent by means of only one or two of them. Experimental work has shown that these factors are not equally important; the strongest effect is produced by pitch, and length is also a powerful factor. Loudness and quality have much less effect.

## 10.2 Levels of stress

Up to this point we have talked about stress as though there were a simple distinction between “stressed” and “unstressed” syllables with no intermediate levels; such a treatment would be a **two-level** analysis of stress. Usually, however, we have to recognise one or more intermediate levels. It should be remembered that in this chapter we are dealing only with

stress *within the word*. This means that we are looking at words as they are said in isolation, which is a rather artificial situation: we do not often say words in isolation, except for a few such as ‘yes’, ‘no’, ‘possibly’, ‘please’ and interrogative words such as ‘what’, ‘who’, etc. However, looking at words in isolation does help us to see stress placement and stress levels more clearly than studying them in the context of continuous speech.

Let us begin by looking at the word ‘around’ ə'raʊnd, where the stress always falls clearly on the last syllable and the first syllable is weak. From the point of view of stress, the most important fact about the way we pronounce this word is that on the second syllable the pitch of the voice does not remain level, but usually falls from a higher to a lower pitch. We can diagram the pitch movement as shown below, where the two parallel lines represent the speaker’s highest and lowest pitch level. The prominence that results from this pitch movement, or **tone**, gives the strongest type of stress; this is called **primary stress**.



In some words, we can observe a type of stress that is weaker than primary stress but stronger than that of the first syllable of ‘around’; for example, consider the first syllables of the words ‘photographic’ fəʊtə'græfɪk, ‘anthropology’ ænθrə'pɒlədʒi. The stress in these words is called **secondary stress**. It is usually represented in transcription with a low mark ( ) so that the examples could be transcribed as fəʊtə'græfɪk, ænθrə'pɒlədʒi.

We have now identified two levels of stress: primary and secondary; this also implies a third level which can be called **unstressed** and is regarded as being the absence of any recognisable amount of prominence. These are the three levels that we will use in describing English stress. However, it is worth noting that unstressed syllables containing ə, ɪ, i, u, or a syllabic consonant, will sound less prominent than an unstressed syllable containing some other vowel. For example, the first syllable of ‘poetic’ pəʊ'etɪk is more prominent than the first syllable of ‘pathetic’ pə'θetɪk. This *could* be used as a basis for a further division of stress levels, giving us a third (“tertiary”) level. It is also possible to suggest a tertiary level of stress in some polysyllabic words. To take an example, it has been suggested that the word ‘indivisibility’ shows four different levels: the syllable bɪl is the strongest (carrying primary stress), the initial syllable ɪn has secondary stress, while the third syllable vɪz has a level of stress which is weaker than those two but stronger than the second, fourth, sixth and seventh syllable (which are all unstressed). Using the symbol ɹ to mark this tertiary stress, the word could be represented like this: ɹɪndɪvɪzə'bɪlətɪ. While this may be a phonetically correct account of some pronunciations, the introduction of tertiary stress seems to introduce an unnecessary degree of complexity. We will transcribe the word as ɹɪndɪvɪzə'bɪlətɪ.

### 10.3 Placement of stress within the word

We now come to a question that causes a great deal of difficulty, particularly to foreign learners (who cannot simply dismiss it as an academic question): how can one select

the correct syllable or syllables to stress in an English word? As is well known, English is not one of those languages where word stress can be decided simply in relation to the syllables of the word, as can be done in French (where the last syllable is usually stressed), Polish (where the syllable before the last – the penultimate syllable – is usually stressed) or Czech (where the first syllable is usually stressed). Many writers have said that English word stress is so difficult to predict that it is best to treat stress placement as a property of the individual word, to be learned when the word itself is learned. Certainly anyone who tries to analyse English stress placement has to recognise that it is a highly complex matter. However, it must also be recognised that in most cases (though certainly not all), when English speakers come across an unfamiliar word, they can pronounce it with the correct stress; in principle, it should be possible to discover what it is that the English speaker knows and to write it in the form of rules. The following summary of ideas on stress placement in nouns, verbs and adjectives is an attempt to present a few rules in the simplest possible form. Nevertheless, practically all the rules have exceptions and readers may feel that the rules are so complex that it would be easier to go back to the idea of learning the stress for each word individually.

In order to decide on stress placement, it is necessary to make use of some or all of the following information:

- i) Whether the word is morphologically **simple**, or whether it is **complex** as a result either of containing one or more affixes (i.e. prefixes or suffixes) or of being a compound word.
- ii) What the grammatical category of the word is (noun, verb, adjective, etc.).
- iii) How many syllables the word has.
- iv) What the phonological structure of those syllables is.

It is sometimes difficult to make the decision referred to in (i). The rules for complex words are different from those for simple words and these will be dealt with in Chapter 11. Single-syllable words present no problems: if they are pronounced in isolation they are said with primary stress.

Point (iv) above is something that should be dealt with right away, since it affects many of the other rules that we will look at later. We saw in Chapter 9 that it is possible to divide syllables into two basic categories: **strong** and **weak**. One component of a syllable is the **rhyme**, which contains the syllable peak and the coda. A strong syllable has a rhyme with

*either* (i) a syllable peak which is a long vowel or diphthong, with or without a following consonant (coda). Examples:

‘die’ daɪ            ‘heart’ hɑ:t            ‘see’ si:

*or* (ii) a syllable peak which is a short vowel, one of ɪ, e, æ, ʌ, ɒ, ʊ, followed by at least one consonant. Examples:

‘bat’ bæʔ            ‘much’ mʌʔf            ‘pull’ pʊʔ

A weak syllable has a syllable peak which consists of one of the vowels ə, i, u and no coda except when the vowel is ə. Syllabic consonants are also weak. Examples:

‘fa’ in ‘sofa’ 'səʊfə

‘zy’ in ‘lazy’ 'leɪzi

‘flu’ in ‘influence’ 'ɪnfluəns

‘en’ in ‘sudden’ 'sʌdn̩

The vowel ɪ may also be the peak of a weak syllable if it occurs before a consonant that is initial in the syllable that follows it. Examples:

‘bi’ in ‘herbicide’ 'hɜːbɪsaɪd

‘e’ in ‘event’ ɪ'vent

(However, this vowel is also found frequently as the peak of stressed syllables, as in ‘thinker’ 'θɪŋkə, ‘input’ 'ɪnpʊt.)

The important point to remember is that, although we do find unstressed strong syllables (as in the last syllable of ‘dialect’ 'daɪəlekt), *only* strong syllables can be stressed. Weak syllables are always unstressed. This piece of knowledge does not by any means solve all the problems of how to place English stress, but it does help in some cases.

## Two-syllable words

⌈ AU10 (CD 2), Ex 3

In the case of simple two-syllable words, either the first or the second syllable will be stressed – not both. There is a general tendency for verbs to be stressed nearer the end of a word and for nouns to be stressed nearer the beginning. We will look first at verbs. If the final syllable is weak, then the first syllable is stressed. Thus:

‘enter’ 'entə

‘open’ 'əʊpən

‘envy’ 'envi

‘equal’ 'iːkwəl

A final syllable is also unstressed if it contains əʊ (e.g. ‘follow’ 'fɒləʊ, ‘borrow’ 'bɒrəʊ).

If the final syllable is strong, then that syllable is stressed even if the first syllable is also strong. Thus:

‘apply’ ə'plai

‘attract’ ə'trækt

‘rotate’ rəʊ'teɪt

‘arrive’ ə'raɪv

‘assist’ ə'sɪst

‘maintain’ meɪn'teɪn

Two-syllable simple adjectives are stressed according to the same rule, giving:

‘lovely’ 'lʌvli

‘divine’ dɪ'vaɪn

‘even’ 'iːvən

‘correct’ kə'rekt

‘hollow’ 'hɒləʊ

‘alive’ ə'laɪv

As with most stress rules, there are exceptions; for example: ‘honest’ 'ɒnɪst, ‘perfect’ 'pɜːfɪkt, both of which end with strong syllables but are stressed on the first syllable.

Nouns require a different rule: stress will fall on the first syllable unless the first syllable is weak and the second syllable is strong. Thus:

'money' 'mʌni	'divan' dɪ'væn
'product' 'prɒdʌkt	'balloon' bə'lu:n
'larynx' 'læriŋks	'design' dɪ'zaɪn

Other two-syllable words such as adverbs seem to behave like verbs and adjectives.

### Three-syllable words

Here we find a more complicated picture. One problem is the difficulty of identifying three-syllable words which are indisputably simple. In simple verbs, if the final syllable is strong, then it will receive primary stress. Thus:

'entertain' ,entə'teɪn	'resurrect' ,rezə'rekt
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If the last syllable is weak, then it will be unstressed, and stress will be placed on the preceding (penultimate) syllable if that syllable is strong. Thus:

'encounter' ɪŋ'kaʊntə	'determine' dɪ'tɜ:mɪn
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If both the second and third syllables are weak, then the stress falls on the initial syllable:

'parody' 'pærədi	'monitor' 'mɒnɪtə
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Nouns require a slightly different rule. The general tendency is for stress to fall on the first syllable unless it is weak. Thus:

'quantity' 'kwɒntəti	'emperor' 'empərə
'custody' 'kʌstədi	'enmity' 'enməti

However, in words with a weak first syllable the stress comes on the next syllable:

'mimosa' mɪ'məʊzə	'disaster' dɪ'zɑ:stə
'potato' pə'teɪtəʊ	'synopsis' sɪ'nɒpsɪs

When a three-syllable noun has a strong final syllable, that syllable will not usually receive the main stress:

'intellect' 'ɪntələkt	'marigold' 'mæriɡəʊld
'alkali' 'ælkəlaɪ	'stalactite' 'stæləktat

Adjectives seem to need the same rule, to produce stress patterns such as:

'opportune' 'ɒpətju:n	'insolent' 'ɪnsələnt
'derelict' 'derəlɪkt	'anthropoid' 'ænrəpɔɪd

The above rules certainly do not cover all English words. They apply only to major categories of lexical words (nouns, verbs and adjectives in this chapter), not to function

words such as articles and prepositions. There is not enough space in this course to deal with simple words of more than three syllables, nor with special cases of loan words (words brought into the language from other languages comparatively recently). Complex and compound words are dealt with in Chapter 11. One problem that we must also leave until Chapter 11 is the fact that there are many cases of English words with alternative possible stress patterns (e.g. ‘controversy’ as either 'kɒntrəvɜːsi or kən'trɒvəsi). Other words – which we will look at in studying connected speech – change their stress pattern according to the context they occur in. Above all, there is not space to discuss the many exceptions to the above rules. Despite the exceptions, it seems better to attempt to produce *some* stress rules (even if they are rather crude and inaccurate) than to claim that there is no rule or regularity in English word stress.

### Notes on problems and further reading

The subject of English stress has received a large amount of attention, and the references given here are only a small selection from an enormous number. As I suggested in the notes on the previous chapter, incorrect stress placement is a major cause of intelligibility problems for foreign learners, and is therefore a subject that needs to be treated very seriously.

10.1 I have deliberately avoided using the term *accent*, which is found widely in the literature on stress – see, for example, Cruttenden (2008), p. 23. This is for three main reasons:

- i) It increases the complexity of the description without, in my view, contributing much to its value.
- ii) Different writers do not agree with each other about the way the term should be used.
- iii) The word *accent* is used elsewhere to refer to different varieties of pronunciation (e.g. “a foreign *accent*”); it is confusing to use it for a quite different purpose. To a lesser extent we also have this problem with the word *stress*, which can be used to refer to psychological tension.

10.2 On the question of the number of levels of stress, in addition to Laver (1994: 516), see also Wells (2008).

10.3 It is said in this chapter that one may take one of two positions. One is that stress is not predictable by rule and must be learned word by word (see, for example, Jones 1975: Sections 920–1). The second (which I prefer) is to say that, difficult though the task is, one must try to find a way of writing rules that express what native speakers naturally tend to do in placing stress, while acknowledging that there will always be a substantial residue of cases which appear to follow no regular rules. A very thorough treatment is given by Fudge (1984). More recently, Giegerich (1992) has presented a clear analysis of English word stress (including a useful explanation of *strong*, *weak*, *heavy* and *light* syllables); see p. 146

and Chapter 7. I have not adopted the practice of labelling syllables *heavy* and *light* to denote characteristics of phonological structure (e.g. types of peak and coda), though this could have been done to avoid confusion with the more phonetically-based terms *strong* and *weak* introduced in Chapter 9. For our purposes, the difference is not important enough to need additional terminology.

There is another approach to English stress rules which is radically different. This is based on **generative phonology**, an analysis which was first presented in Chomsky and Halle (1968) and has been followed by a large number of works exploring the same field. To anyone not familiar with this type of treatment, the presentation will seem difficult or even unintelligible; within the generative approach, many different theories, all with different names, tend to come and go with changes in fashion. The following paragraph is an attempt to summarise the main characteristics of basic generative phonology, and recommends some further reading for those interested in learning about it in detail.

The level of phonology is very abstract in this theory. An old-fashioned view of speech communication would be that what the speaker intends to say is coded – or *represented* – as a string of phonemes just like a phonemic transcription, and what a hearer hears is also converted by the brain from sound waves into a similar string of phonemes. A generative phonologist, however, would say that this phonemic representation is not accurate; the representation in the brain of the speaker or hearer is much more abstract and is often quite different from the ‘real’ sounds recognisable in the sound wave. You may hear the word ‘football’ pronounced as fʊpbɔ:l, but your brain recognises the word as made up of ‘foot’ and ‘ball’ and interprets it phonologically as fʊtbɔ:l. You may hear ə in the first syllable of ‘photography’, in the second syllable of ‘photograph’ and in the third syllable of ‘photographer’, but these ə vowels are only the *surface* realizations of *underlying* vowel phonemes. An abstract phonemic representation of ‘photograph’ (including the relevant part of ‘photography’, ‘photographic’ and ‘photographer’) would be something like fɔ:tɒgrɑf; each of the three underlying vowels (for which I am using symbols different from those used in the rest of this book) would be realised differently according to the stress they received and their position in the word: the ɔ: in the first syllable would be realised as əʊ if stressed (‘photograph’ ˈfəʊtəgrɑ:f, ‘photographic’ ˈfəʊtəˈgræfɪk) and as ə if unstressed (‘photography’ fəˈtɒgrəfi); the ɒ in the second syllable would be realised as ɒ if stressed (‘photography’ fəˈtɒgrəfi) and as ə if unstressed (‘photograph’ ˈfəʊtəgrɑ:f), while the a in the third syllable would be realised as æ if stressed (‘photographic’ fəʊtəˈgræfɪk), as either ɑ: or æ if in a word-final syllable (‘photograph’ ˈfəʊtəgrɑ:f or ˈfəʊtəgræf) and as ə if unstressed in a syllable that is not word-final (‘photography’ fəˈtɒgrəfi). These vowel changes are brought about by *rules* – not the sort of rules that one might teach to language learners, but more like the instructions that one might build into a machine or write into a computer program. According to Chomsky and Halle, at the abstract phonological level words do not possess stress; stress (of many different levels) is the result of the application of phonological rules, which are simple enough in theory but highly complex in practice. The principles of these rules are explained first on pp. 15–43 of Chomsky and Halle (1968), and in greater detail on pp. 69–162.



There is a clear and thorough introductory account of generative phonology in Clark *et al.* (2007: Chapter 5), and they present a brief account of the generative treatment of stress in section 9.7. A briefer review is given in Katamba (1989: Chapter 11, Section 1).

### Notes for teachers

It should be clear from what is said above that from the purely practical classroom point of view, explaining English word stress in terms of generative phonology could well create confusion for learners. Finding practice and testing material for word stress is very simple, however: any modern English dictionary shows word stress patterns as part of word entries, and lists of these can be made either with stress marks for students to read from (as in Exercise 2 of Audio Unit 10), or without stress marks for students to put their own marks on (as in Exercise 1 of the same Audio Unit).

### Written exercises

Mark the stress on the following words:

1 Verbs

- |            |               |
|------------|---------------|
| a) protect | e) bellow     |
| b) clamber | f) menace     |
| c) festoon | g) disconnect |
| d) detest  | h) enter      |

2 Nouns

- |             |               |
|-------------|---------------|
| a) language | e) event      |
| b) captain  | f) jonquil    |
| c) career   | g) injury     |
| d) paper    | h) connection |

(Native speakers of English should transcribe the words phonemically as well as marking stress.)