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Variants of the Phoneme /T/ in English

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1. Description of the Phoneme /T/

The consonant /t/ is one of the six English plosives. It is described as an alveolar voiceless plosive.

When /t/ is produced, a total stricture is formed by two articulators moving against each other, for which no air is released from the vocal tract. Then, the air compressed from the closure is allowed to escape, which can be heard as plosion (a burst of noise) like a sound *h* (Roach, 2000).

In English, both /t/ and /d/ are alveolar plosives. One fundamental difference between /t/ and /d/, when produced in isolation, is voicing in that /t/ is voiceless and /d/ is voiced. The voiceless plosive /t/ is pronounced with stronger air force than the voiced one /d/.

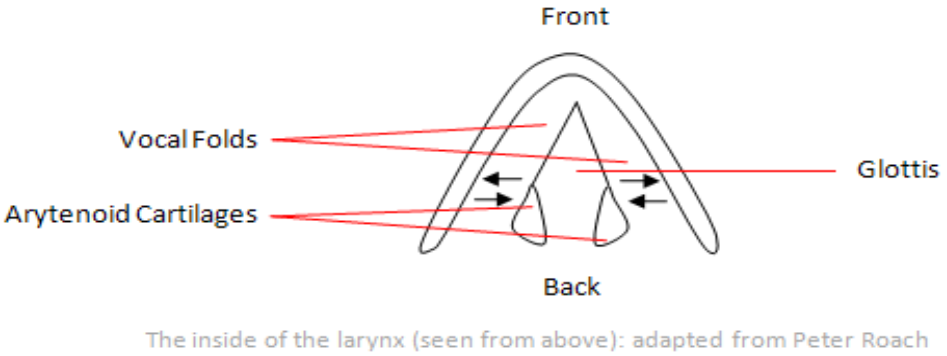

Fig1. *Vocal Folds*

It is important to note several Asian languages, such as Chinese and Vietnamese, have similar sounds to the plosive /t/ in English; however, these sounds are produced with the tongue normally pressed against the front teeth and are unaspirated, whereas the English plosive /t/ is alveolar, with the tongue blade touching the alveolar ridge.

Fig2. *Alveolar articulation*

2. Variations of the Phoneme /T/ in Different Verbal Environments

The English plosive /t/ changes significantly in differing verbal environments. It can occur in initial position (at the beginning of a word), medial position (between sounds) and final position (at the end of a word).

2.1. In the Initial Position

In initial position, it may be hard to distinguish the sounds /t/ and /d/ if we only base on their voicing since /t/ remains voiceless and /d/ is devoiced. The primary difference between them in this situation is aspiration in that /t/ is aspirated, but /d/ is produced with no aspiration. This can be illustrated as follows:

tip	[t^{h}Ip]
tan	[t^{h}æn]

2.2. In Final Position

In final position, the plosive /t/ shortens the preceding vowel, which can show a distinction between a minimal pair ending with /t/ and /d/. Listeners may hear this difference as /t/ is closer to the vowel than /d/. For example, in BBC pronunciation, we find the following:

hit	[hĬt]
set	[sĕt]

Those with the American accent may say turn /t/ into /d/ when it in final position (after a vowel). However, the shortening effect still takes place. It is vital to note that this shortening effect is clearer in American than in British English. In fact, British people just shorten the vowel preceding /t/ and do not lengthen the vowel preceding /d/ (Davidsen-Nielsen, 1969); nevertheless, Americans make the vowel longer when it is followed by /d/ (Chen, 1970).

2.3. In the Medial Position

When the plosive /t/ is produced between two vowels, it is the final consonant of the preceding syllable if it is stressed. Therefore, it has the characteristics of a final consonant. Americans generally pronounce it like /d/.

When vowel of the preceding syllable is one of the weak vowels /Ə/, /i/ or /u/, the sound /t/ appears to be the initial consonant of the following syllable and it has the characteristics of an initial consonant.

2.4. In Consonant Clusters

In natural connected speech, the phoneme /t/ may be changed by its neighboring sounds as a result of assimilation, which is one of the main causes of different realizations of a sound.

When the sound /t/ is preceded by /s/, it becomes unaspirated; that is, a burst of noise is unnoticeable during the production of /t/.

When the sound /t/ is the initial consonant of an unstressed syllable preceded by /n/ or /ŋ/ in a stressed syllable as in /twenty/, the plosive /t/ is nasalized and becomes /n/ as follows.

twenty	[‘twenni]
internet	[‘innƏnet]
want to	[wannƏ]
going to	[gDnnƏ]

When the plosive /t/ is followed by /ʃ/, they can be integrated into one phoneme called an affricate /tʃ/as these sounds are homorganic. Illustrations are given as follows:

suggest	/sƏ’ʤest/	suggestion	/sƏ’ʤestʃ(Ə)n/
exhaust	/Ig’zↃ:st/	exhaustion	/ Ig’zↃ:stʃ(Ə)n/

This combination is produced with a glide of the tongue from /t/ to /ʃ/. It is described as an aspirated voiceless post-alveolar affricate. It has almost all qualities of /t/. When /tʃ/ is final, it shortens the preceding vowel.

When /t/ is followed by /j/, the combination /tj/ becomes /tʃ/, a few of which are given below:

fortune [’fↃ:tʃu:n] (British English) or [’fↃ:tʃ(Ə)n](American English)

meet you [mi:tʃƏ]

get you [getʃƏ]

When /t/ comes after /k/ and /s/, it turns into /k/ and /s/ respectively as follows:

that case [ðæk keIz]

neat kitchen [ni:k kitʃ(Ə)n]

let see [les si:]

art sword [a: s sↃ:d]

When /t/ precedes a bilabial, it becomes bilabial. Let's examine the following examples:

meat ball [mi:p bↃ:l]

eat more [i:p mↃ:]

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