

PAPER 6 (DESCRIPTIVE LINGUISTICS)
How are allophones grouped in a phoneme?

Allophones are grouped in a phoneme on the basis of "phonetic similarity", complementary distribution, and "symmetrical patterning".
PHONETIC SIMILARITY: It is a discovery procedure of phonemes that are phonetically similar. This procedure requires the availability of a good phonetic transcription of a corpus of utterances in the language to be analyzed. We then inspect the transcription for sounds which are phonetically similar to each other in order to see how these phonetically similar sounds distribute in relation to other sounds. Phonetically similar sounds are sounds that share a phonetic feature, such as nasality ([m] and [n]), or labial quality ([p] and [b]), or front vowel quality ([i] and [e]), or stop quality ([t] and [ʔ]). In practice, linguists sometimes experience difficulty in defining the concept of "phonetic similarity" and "sharing feature" to cover all known cases, so proceed on intuition in such work. However, we should note that the best intuitions in such matters are usually possessed by those who have acquired considerable experience through working with a variety of unrelated languages.

COMPLEMENTARY DISTRIBUTION: Having discovered the sets of phonetically similar sounds, for example [p] and [f], or [k], [x], and [g], or [e] and [ɛ], we must then ask whether the variation in each set can be accounted for in terms of the phonetic environments of the members of the set. If utterances can begin with either [p] or [f] and the same vowels can occur following both [p] and [f], then nothing in the environments would seem to produce the variation between [p] and [f]. The variation is apparently important, reflects a significant difference to the speaker, and establishes /p/ and /f/ as contrasting phonemes. Such is the case in English, in which "pin" contrasts with "fin". If, in examining the distribution of [k], [x] and [g] in a language other than in English, we find that k always occurs initially and finally in utterances, [x] always occurs before consonants, and [g] always occurs between vowels, we might as well hypothesize, that in this language really only one functional unit, or phoneme, exists. We could write this phoneme as /k/ and say that it has three variants, or allophones, [k], [x] and [g], the first initially, and finally the second before consonants, and the third intervocalically. If, again in a language other than English, [ɛ] occurs always before consonants and [e] occurs always before vowels or a pause, only one contrastive unit is established, and this phoneme might be written as /e/, that is, of its allophones, can be stated as follows:

/e/

[ɛ] before consonants

[e] elsewhere.

The choice of the symbol between diagonal bars may be quite arbitrary because it represents a contrastive unit, not a sound. Nevertheless, the symbol has a mnemonic value which should not be ignored if it is chosen to suggest the most characteristic allophone associated with the phoneme. It is also important to order the allophones in the statement so as to achieve the greatest economy by avoiding redundancy and by using a simple "elsewhere" statement for the distribution of the final allophone in any list.

The important principle just illustrated is the principle of complementary distribution. Phonetically similar sounds in complementary distribution are allophones of a single phonemes. An alternative way of stating the principle is to say that a phoneme may be realized by slightly different sounds in different environments. This fact should not surprise us: we would expect the environment in which something appears to have an effect because environment affects most things. We should regard a phoneme as a kind of ideal reference point in an ideal contrastive system of phonemes which speakers of a language share. When a speaker says something, he realizes a selection of these phonemes in phonetic substance. The phonetic substance for any particular phoneme is not a constant but varies within certain limits according to the environment in which it occurs.

It is interesting to observe how the principle of complementary distribution works with certain English phonemes. We find an aspirated voiceless bilabial stop [ph] initially in 'pot', a voiced bilabial stop [b] initially in 'big', finally in 'rob' and medially in 'robber', an unreleased voiceless bilabial stop [p̚] in mop, and a voiceless bilabial stop [p] in 'spin'. All these sounds - [ph], [b], [p̚] and [p] are phonetically same, for they all possess the features of bilabial and stop quality. The basic linguistic problem is to see how they are distributed in relation to each other. First of all, [b] and [ph] contrast in initial position, for both can appear in the same environment as in 'bin' [bin] and 'pin' [phin]. In final position both [b] and [p̚] can be found to contrast, as in [rob] and [rop̚]. But [ph], [p̚] and [p] never contrast with each other. We can therefore say that in English there is a phonemic contrast /b/ and /p/. The first of these phonemes seems to have only one allophone [b]; however, the second has three allophones [ph], [p̚], and [p] in complementary distribution. When a speaker of English pronounces a word which begins with /p/, he must choose an aspirated allophones [ph]. If the word has a /p/ in the middle, he must choose an unaspirated allophone [p̚] for that occurrence, and a final /p/ will probably be unreleased [p̚]. A more economical way of stating this completely distribution of the three allophones is as follows:

/p/
[ph] initially
[p̚] finally
[p] elsewhere

In reality, any one of the three allophones of /p/ may occur in final position without any resulting difference in meaning. Such variation in certain environments among allophones is called free variation. The same variation may not exist in other environments.

SYMMETRICAL PATTERNING

A third principle is often used to those of phonetic similarity and complementary distribution. Phonemes seems to have symmetrical phonological systems, so that if we establish four "voiced" stop phonemes, four "voiceless" stop, and four "voiced" fricative phonemes for a particular language, we would expect to find that any set of "voiceless" fricative phonemes in the same language would number four rather than three or five. Likewise, if three of the voiceless stops had aspirated allophones in initial positions but unaspirated allophones in other positions, we would expect the allophones of the fourth

phoneme to share the same distributional characteristics. Although this principle of symmetrical patterning appears to be used on occasion to force data to fit a pattern, as perhaps with the overall vowel inventory devised for English by Trager and Smith, it often produces results which are in accord with a native speaker's intuitions about the structure of the language.