

SOME REMARKS ON ASPIRATION IN RECEIVED PRONUNCIATION WITH REFERENCE TO POLISH

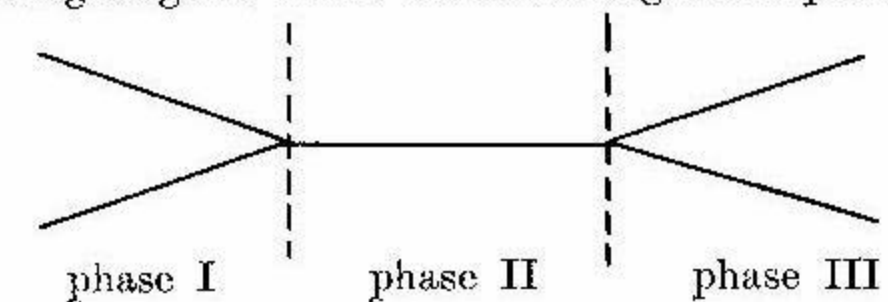
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Aspiration in English is associated with the articulation of tense plosives (where "plosive" means a pulmonic egressive stop), i.e. [p t k]. It should be borne in mind that a plosive, from the articulatory point of view, consists of three phases:

- onglide — where the articulators are coming together;
- hold — when there are two closures: an oral closure (the articulators are already together not allowing for any escape of air through the mouth) and a velic closure; the air continues being pushed out from the lungs and the pressure is built up;
- offglide — when the articulators open and the air escapes producing a plosion.

The following diagram shows the three stages of a plosive:



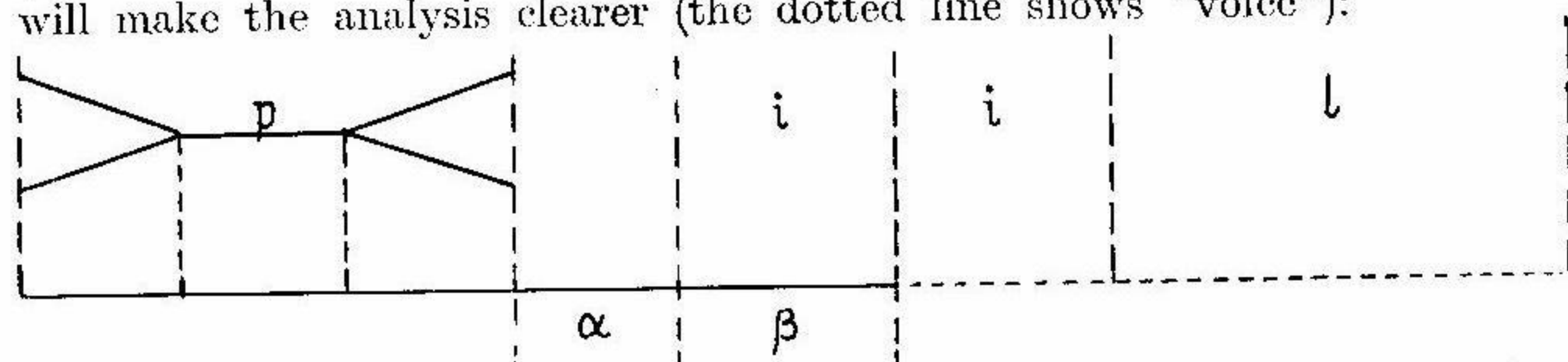
David Abercrombie using the above diagram defines aspiration as "a period of voicelessness that follows the voiceless closure phase of a stop" (1967 : 148). In other words, a plosive is aspirated if its offglide is voiceless and unaspirated if voice sets in after the hold phase. Wiktor Jassem describes aspiration as a certain vocalic segment characterized by some noise in the glottis. The noise is however, weaker than the one that is heard at the beginning of words such as *head*, *heart*. This noise is defined as the aspirate (cf. Jassem 1964 : 62).

Chomsky and Halle associate aspiration primarily with pressure. For them aspiration means two things: lack of constriction at the glottis and heightened subglottal pressure (1968 : 326).

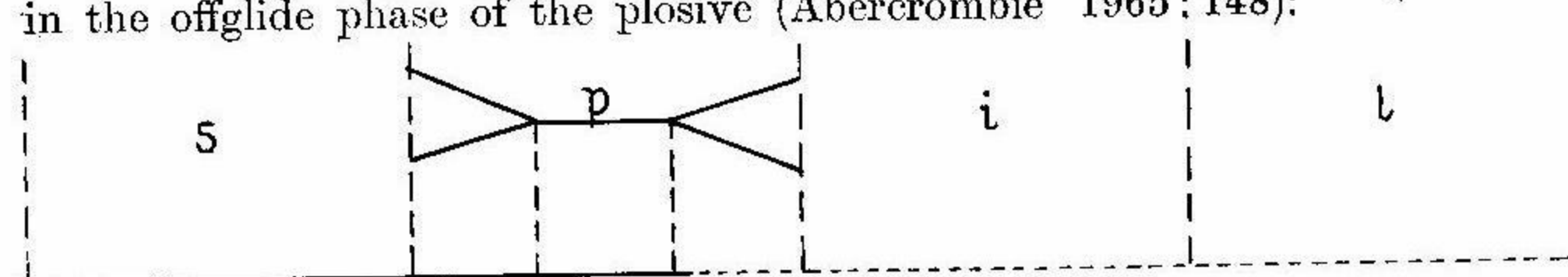
It seems, however, that, from the structural point of view, aspiration should be looked for in the analysis of segments which FOLLOW the offglide phase of a plosive and not in the analysis of the plosive itself. Let us compare the articulation of a few words:

pill — *spill*
till — *still*
kill — *skill*

It is generally agreed (cf., for example, Jassem 1964 : 62) that the initial plosives in the left-hand column are aspirated and those in the right-hand column, preceded by [s] are unaspirated. The aspirated plosives (unlike the unaspirated ones) are accompanied by an audible strong puff of air following the offglide phase. Jones says that "breath is heard" (1956 : 153). Gimson stresses that it is "a strongly expelled breath" coming between the offglide of the plosive and the onglide of the following vowel (1966 : 146). In fact the following vowel consists of two segments — voiceless and voiced (Biedrzycki 1971 : 116, cf. also Jassem 1971 : 172). The puff of air is audibly distinguishable and so strong that, it seems, one can regard it as a separate segment. Thus, the aspirated plosive is followed by two voiceless segments: the puff of air (which we will call alpha) and the vowel (which we will call beta). The diagram will make the analysis clearer (the dotted line shows "voice"):



On the other hand, in the unaspirated plosive, voice sets in much earlier, in the offglide phase of the plosive (Abercrombie 1965 : 148):



Thus, aspiration consists in the presence of two voiceless segments following the plosive: α and β . A question arises why the voiceless offglide phase is not regarded as an element of aspiration although in the diagram it appears only with aspirated sounds. It is not for two reasons: firstly, the non-relevance of the voicing or voicelessness of the offglide leaves a margin of tolerance for

certain differences between unaspirated plosives (with some, voice most probably sets in after the offglide; these are usually quoted as "weakly aspirated, cf. Gimson's [p] in *polite* (1966 : 146), while in our understanding they will be variants of unaspirated plosives), secondly, it would be difficult to decide where the offglide really ends and the α segment begins (the offglide phase is extremely short).

Now let us examine the devoicing of consonants which can follow plosives:¹

According to Jassem (1971):

play, clean [l] completely devoiced (221)
split, quickly [l] half devoiced, i.e. consisting of two segments — voiceless and voiced (222)
*proud, cry*² [r] completely devoiced (259)
spray, scream, apron, secret [r] half-devoiced (259)
pure, tune, cure, [j] completely devoiced (261)
spurious, student, skewer, virtue, percutaneous [j] half-devoiced (261)

According to Gimson (1966):

twig, queen [w] completely devoiced (212)
square, upward, outward, equal [w] half-devoiced (211)

It should be noticed that there is complete devoicing of the following consonant when it is preceded by a tense plosive in a stressed syllable, i.e. in the position where we usually have aspiration. On the other hand, consonants are only half-devoiced when the plosive appears after [s] or word-medially, i.e. in the positions where there is no aspiration. These observations lead one to the conclusion that the cases of complete devoicing of the consonant following the plosive should be regarded as a manifestation of aspiration although of a different kind than in the sequences plosive+vowel.

A question arises whether there are any similarities between the type of aspiration as described formerly and the consonant-devoicing type of aspiration. The answer is affirmative if certain theoretical solutions are recognized. It seems possible, though quite arbitrary, to regard the completely voiceless [l r j w] as sequences of two segments which happen to be identical³. There is no doubt that "the half-devoiced" consonants are sequences of two segments: voiceless and voiced (cf. Jassem 1971 : 94). The postulation of two identical

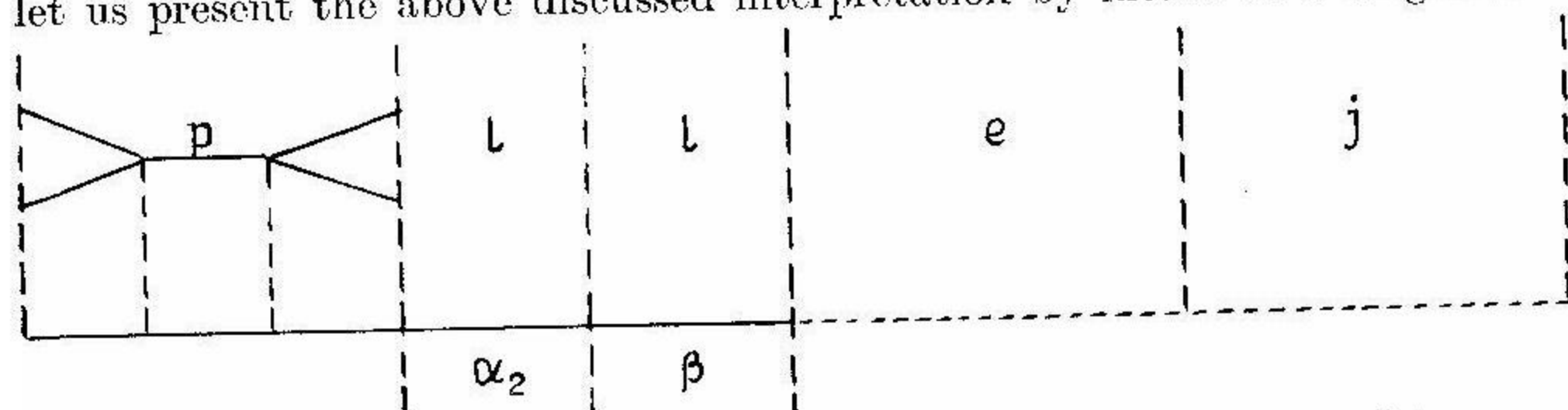
¹ If we exclude non-English words such as *tse-tse* and unusual secondary pronunciations such as [ps] in *psychology*, then word-initial plosives can only combine with [l r j w].

² [tr] should be treated as a voiceless affricate of the same nature as [tʃ]. Affricates, although often associated with the stop series, are not considered in this paper.

³ Such solutions have already been postulated. For example, L. Biedrzycki (1971 : 136) interprets phonologically the vowel in *more* as a sequence of two identical elements (oo).

segments, although acoustically not recognizable (lack of differentiating feature), is possible from the structural point of view.⁴

Coming back to the suggestion given at the beginning of this paper (aspiration should, be looked for in the analysis of segments that follow the plosive) let us present the above discussed interpretation by means of a diagram:



Both in *pill* and in *play* aspiration manifests itself as a sequence of two segments α and β . However, formerly α meant a strong puff of air, in *play* it means a devoiced consonantal segment. Thus there are two types of α which we shall distinguish as α_1 (the former meaning of α) and α_2 (the latter meaning). β in both cases manifests itself as a devoiced segment being either vocalic (in *pill*) or consonantal (in *play*).

The distinction of two types of α consequently leads to the distinction of two types of aspiration which will be termed released (the one having α_1) and unreleased (the one having α_2).

The released aspiration, i.e. having the structure $\alpha_1 + \beta$, occurs when a plosive is followed by a vowel in a stressed syllable. In other words, in *pertain*, for example, [t] will be accompanied by aspiration and [p] not, since it appears in an unstressed syllable. A restriction must be made here: there is no aspiration if a plosive is preceded by [s] in the same word (Gimson 1966: 146). Thus *that stuff* differs from *that's tough* by the absence of aspiration in the first phrase and its presence in the second (Jassem 1964: 54, cf. also Gimson's explanation of the difference by means of juncture 1966: 276).

[s] and other consonants preceding a plosive in another syllable can only reduce aspiration to some extent but they do not obliterate it. This relative reduction of aspiration manifests itself in the possible shortening of the α and β segments. Gimson quotes *push, past, brief, talking, fresh coat* (147) as having a certain reduction of aspiration in the articulation of the plosives.

The released aspiration can also occur if a tense plosive is final in a stressed

syllable (cf. Jassem 1971: 173, 178, 186). However, here, unlike in the syllable initial position, the requirement is that a pause must follow. Thus, aspiration appears in *hope, hat, lack*⁵, but not in *the hopes, the hat is nice, his lack of courage* since the plosives are followed by other sounds and there is no pause. The preceding sounds have no bearing on aspiration, i.e. the plosive can be preceded by a vowel (as above) or by a consonant as in *help, belt*. The segmental analysis of the aspiration in word-final position shows the presence of α and β which manifests itself here as a pause (a pause being a period of voicelessness).

The unreleased aspiration (the structure $\alpha_2 + \beta$) as has been mentioned above, occurs when a tense plosive not preceded by [s] is followed by [l r j w] in a stressed syllable (on the status of [tr] cf. note 2 below). It is called "unreleased" because it appears not as an audible puff of air but as a devoiced consonantal segment⁶.

It should be noticed that when plosives are not accompanied by aspiration they behave like all other tense consonants, i.e., they devoice the following [l r j w] only partially.

Compare: *split, slow* — where [l] is half-devoiced (Jassem 1971: 222)
apron, free — where [r] is half-devoiced (Jassem 1971: 259)
student, few — where [j] is half-devoiced (Jassem 1971: 261)
square, swim — where [w] is half-devoiced (Gimson 1966: 211)

This partial devoicing is, therefore, a general property of all tense unaspirated consonants in English.

As far as Polish is concerned it is generally agreed that aspiration does not occur (cf., for example Wierzchowska 1965: 110, Biedrzycki 1972: 27). This is true of normal unemphatic speech. Doroszewski (1952: 43) explains that the presence of aspiration in some regional dialects of Polish in Northern and Western Poland is due to the influence of German. In the standard Polish accent — the cultural Polish of Warsaw (Warszawska Polszczyzna Kulturalna), which is considered in this paper, aspiration is possible only under special circumstances: in hesitant speech, e.g. *t...ak* (Dhuska 1950: 80) or for emphasis (Doroszewski, 43). From the observations of every day speech, it seems that the introduction of aspiration for emphasis is quite common, for example in interjections: *panie!, tyle pracy, taki nudny*⁷. It is to be noted, how-

⁵ The transference of the α_1 into the α_2 might be due to certain articulatory properties of the following consonants. For instance, with [l] we have a lateral escape (cf. Gimson, 153), with [r] — retroflexion which forms some obstacle in the mouth passage and, consequently, a strong explosion of air (puff) is not possible. The energy is not used for the puff but for devoicing.

⁷ Teaching practice shows that Poles have no difficulty in acquiring aspiration while learning English. However, what they find difficult to do is to change the place of articula-

⁴ It would be interesting to check experimentally whether native speakers of English can distinguish one voiceless segment from the theoretically postulated sequence of two voiceless segments, that is to examine if the difference in length is clearly distinguishable. If it were proved to be true, then the above suggested solution would be acceptable not only structurally but also acoustically.

⁵ Note, however, that in colloquial RP word-final plosives can be "non-released", i.e. can have no offglide (Gimson, 151).

ever, that this aspiration can occur only with voiceless plosives followed by a vowel initially in a stressed syllable. This represents the released type of aspiration. Unreleased aspiration is irrelevant here since Polish has very common and quite regular clusters of voiceless plosives with other voiceless consonants, e.g. /ps/ *psycholog*, /px/ *pchnąć*, /pe/ *psiarnia*.

Finally, a word should be said about the status of aspiration. Aspiration in English should be understood as a certain feature concomitant with the articulation of tense plosives in some contexts and extending over two voiceless segments. It is a phonetic feature usually non-relevant phonologically⁸. It plays the same role in English as the feature [-voice] which, although characteristic of the tense plosives, is not distinctive phonologically (cf. Jakobson 1965 : 38).

Concluding the paper, it seems necessary to sum up the solutions which have been suggested:

(1) aspiration is structurally a sequence of two segments: α and β , the former manifesting itself either as a strong explosion of air (puff) or as a devoiced consonantal segment and the latter being always a devoiced segment (vocalic or consonantal);

(2) in English only a complete devoicing of the consonant following the tense plosive denotes aspiration⁹, a partial devoicing should not be associated with aspiration but it should be rather understood as a general property of all tense plosives;

(3) the English unaspirated plosives may have variants depending on whether voice sets in the offglide phase (e.g. *spill*) or after it (for example, probably in the [p] of *polite* which Gimson, (1966 : 148), describes as weakly aspirated and which in this paper is assigned to the unaspirated series on the basis of the assumption that it differs from the traditional "completely unaspirated" by voicelessness in the offglide phase).

As is evident from the references, the analysis of aspiration done in this paper is primarily based on the findings of Wiktor Jassem (1964 and 1971) and A. C. Gimson (1966). However, some of the solutions and generalizations have been reached by purely theoretical considerations and their validity should be confirmed experimentally.

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tion for instance, while imitating the English [t] in *time*. This confirms the statement that aspiration can appear in Polish though its occurrence is limited to some special cases.

⁸ Some authors, for example Gimson (1966 : 148), say that aspiration can be phonologically distinctive in the word-initial plosives where it helps to distinguish the pairs *pín/bin*, *team/deem*, *come/gum*. It seems better, however, to keep to the Jakobsonian distinction [\pm tense] (1965:38) since the occurrence of this feature is not limited to only some positions of plosive in a word.

⁹ It is also the belief of Gimson (cf. 154, 156, 159) but his analysis is not segmental.