Coronal segments in Irish English

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1 Introduction

One of the most salient differences between Irish English and Standard English (in the sense of Received Pronunciation, Gimson, 1980: 89 ff.) lies in the realization of coronal segments. I use this term in the standard sense of Chomsky and Halle (1968: 304) and intend it to be understood as a convenient means of referring to several groups of sounds which happen to have in common that they all involve the raising of the point or blade of the tongue from a putative neutral position. In using this term I do not necessarily pledge my support to its effectiveness in phonological description (see 3.1 below for a discussion of distinctive features with reference to Irish English). Precisely what segments are involved here will be clear from the remarks below. Before starting however, a word on the term Irish English is called for: by it I mean the variety of English spoken in the Republic of Ireland (on this see Barry, 1982: 101ff.) as the phenomena which I will be discussing are either not at all or only partially found in the variety of English spoken in Northern Ireland (consider the realizations of /t/ and /d/ discussed below which are unique to the Republic). Furthermore I have allowed myself the generalization Irish English although there is considerable variety in the English spoken in the Republic of Ireland. But the term Irish English is used in a fairly restricted sense here: it refers to urban middle-class speech.[1] This excludes contact Irish English (in the areas officially designated as a 'Gaeltacht' (Irish-speaking area) in which both Irish and English are spoken), rural Irish English and lower class urban English. References to, and comments on these latter varieties are labelled specifically as such.

As the area which would justify greater differentiation of Irish English, that of vowel realization is not under consideration here I will retain the general term Irish English. The realm of consonant allophony, with three subdivisions which I will subsequently make (see §3 below) can be regarded as relatively unvarying across the different manifestations of urban middle-class speech.

2 Coronal segments

The general classification of these segments as those which involve the raising of the tongue from a neutral position (Chomsky and Halle 1968: 304) means that they include quite a range of segments which differ in their manners of articulation. Many of these show little or no variation between Irish English and Standard English: the nasal /n/ is the same, as is /r/ (though its distribution is not; it occurs post-vocalically and pre-consonantally in all varieties of Irish English). The lateral /l/ is alveolar in all positions and has no velarized variety anywhere in Irish English, except in contact English. The affricates /tʃ/ and /dʒ/ are also identical to those in Standard English and so will not be commented on further, though the second fricative element of them will.

2.1 *Alveolar stops*

In general the two alveolar stops of Standard English have an alveolar articulation in Irish English also. In a given position, however, their manner of articulation represents the greatest deviation from Standard English to be found anywhere in the consonant inventory of Irish English.

Classification of the realization of alveolar stops in Irish English is done by consideration of their position in a word. Initially one has [tʰ] and [t] (after /s/) as in Standard English.

(1)   a.   *tap*   [tʰæp]
        b.   *star*   [staɹ]

Word-finally /t/ is no longer a stop but a fricative. [ʔ] does not exist in Irish English as an allophone of /t/ as it does in, say, colloquial London (Gimson, 1980: 165) nor is there any noticeable affrication of strongly aspirated stressed /t/. The fricative which is found word-finally is dealt with briefly in Wells (1982: 429f.) although he suggests, inaccurately, an occasional pre-stress realization as a fricative. An even briefer mention is given in Henry (1957: 223), who does not offer a distribution of its occurrence. Hogan (1934: 18) also refers to fricativization of alveolar stops, but with inaccurate phonetic description and classification. Bertz (1975: 277 ff.) deals with this sound at some length, transcribing it as [ś]. He rightly points out its universality in (southern) Irish English but unfortunately describes it as lamino-alveolar and claims that it occurs in pre-stress position, something which is most definitely not the case. Pilch's description (1959: 20f.), which Bertz follows, is not acceptable either. The sound involved here is kept quite distinct from /θ/, /s/ and /ʃ/. It is formed by bringing the apex of the tongue close to the alveolar ridge as if for the articulation of /t/ but stopping just before contact. The resulting sound is a (voiceless) apico-alveolar fricative. Note that it is a controlled articulation and not a ballistic movement such as for the tap widely found as the intervocalic realization of /t/ and /d/ in American English. As there is no IPA symbol for this sound I have chosen to represent it as [t̞], the 't' indicating its phoneme affiliation and the subscript caret the fact that it is a continuant and not a stop.

(2)   *bat*   [bæt̞]

The description of the distribution of [t̞] as being determined by its position in a word turns out to be imprecise when one views forms such as

(3)   a.   *Italy*   [ˈɪt̞ɪli]
        b.   *Italian*   [ɪˈtæliən]

It is clear from this that the distribution is stress conditioned.[2] It is not correct however to maintain that [t̞] only occurs after a stressed syllable. If stress is interpreted suprasegmentally as covering an entire syllable (including the coda) and if [t̞] is then limited to unstressed syllables then the form in (2) would be pronounced [bæt]. A further difficulty would arise if one locates stress on suprasegmental level. There are certain related sets of forms like

(4)   a.   *titan*   ['taitⓒn̩]

        b.   *titanic*   [tai'tænɪk]

which show a shift in stress between noun and adjective. With the adjective the initial /t/ which is part of an unstressed syllable is realized as a stop. Now if one maintains that /t/ in stressed syllables is realized as [t] and by implication in unstressed ones as [t̪] then one can account for the [t̪] in

(5)   *immediate*   [ɪ'mi:dʒɪt̪]

but (*4b*) and all forms like it then conflict with this distribution. A syllabic determination of [t̪] realization should of course go beyond a mere division of syllables into stressed and unstressed. The position of /t/ within a syllable should be considered. The distribution of [t] and [t̪] can now be related to intrasyllabic position. [t] only occurs in syllable onsets and [t̪] only in codas. But this runs up against difficulties with those disyllabic forms where the onset of the second syllable cannot be fixed intuitively. In a form like

(6)   *butter*   ['bʌt̪ɚ]

/t/ is fricative so that according to syllable distribution criteria it must form the coda of the first syllable (/bʌt$ər/). This syllabification has the advantage of closing the first syllable, which ends in a lax vowel. If word phonotactics is taken as superordinate to syllable phonotactics then the first syllable must be closed. However, certain words which have lax vowels in the first syllable followed by an alveolar stop usually have [t] as the realization of /t/.

(7)   a.   *petrol*   [pɛtrəl]

        b.   *buttress*   ['bʌtrəs]

If [t] is confined to syllable onsets then (7a) and (7b) must be syllabified as /pɛ$trəl/ and /bʌ$trəs/ respectively. But this obviously goes against word phonotactics. The /t/ might be regarded as ambisyllabic (see below) but this would demand [t̪] for the coda of the first syllable and [t] for the onset of the next. While this is normally irreconcilable, phonetic factors may be seen to override possible syllable structure considerations: an alveolar stop in Irish English (as in Standard English, Gimson, 1980: 177f.) shifts to an apico-alveolar fricative when an /r/ follows, thus blocking the fricative realization even though a vowel may precede.

    Additional difficulties would arise from a syllable-based distribution of alveolar stop and fricative realizations. In words like

(8)   *titillation*   [tɪt̪ɪ'le:ʃən]

the second /t/ is at least ambisyllabic if not the onset to the second syllable and yet there is fricative realization. Not that ambisyllabicity (Anderson 1969; Higginbottom, 1964) does not offer any help in predicting the occurrence of one realization as opposed to another. In fact it would demand that /t/ be both [t] and [t̪] simultaneously, which is an obvious contradiction.

It would seem that in the treatment of the distribution of [t] and [t̠] it is best to regard stress as segmental and carried by vowels (Lehiste 1970: 120ff.). According to this the stop would only occur before a stressed vowel or an unstressed one if it is initial (see (4) above). In all other cases [t̠] would be found.

A number of further factors have also to be taken into account when one looks at other forms. Consider the words in (9):

(9)   a.   *petulant*   [ˈpɛtʃulənt]
      b.   *infatuate*   [ɪnˈfætʃuet̠]

There is no fricativization of /t/ when it precedes the sequence /ju(:)/ even if it follows directly on a stressed vowel. The reason for this is a phonetic one. In Irish English there is a process of yod absorption whereby all instances of /j/ before an alveolar stop are absorbed into the stop, undergoing assibilation at the same time. This leads to common mergers such as *due* and *Jew* both [dʒu(:)] or *tune* and *chewn* both [tʃu(:)n]. Wherever an alveolar stop forms a phonetic affricate with the following segments (see (9a) and (9b)) there can be no fricative realization even if the structural description for fricativization is otherwise met.

The above environment of a following yod is not the only one which blocks fricative realization. There are a number of others which need to be examined; consider the forms in (10).

(10)   a.   *continue*   [kənˈtɪnju]
       b.   *continent*   [ˈkɒntɪnɪnt]

It is plain from (10b) that despite the post-stress position of /t/ it still has a stop realization. Forms such as

(11)   a.   *quilt*   [kwɪlt]
       b.   *bent*   [bɛnt]

show that a continuant realization is only possible if /t/ follows a stressed vowel and is preceded by a segment which is continuant. If and when a segment follows /t/ then it must be [+continuant]. Here I am using the term continuant in the sense in which it is normally found in generative phonology (Chomsky and Halle, 1968: 317). Along with Chomsky and Halle I regard nasals as stops as there is complete oral closure during their articulation. While /l/ presents some difficulties in terms of labelling as continuant or not (Chomsky and Halle, 1968: 318) the problems concerned with lateral opening for /l/ are irrelevant to the issue at hand as /l/ always has apical closure, and so for the realization of a following alveolar stop (which is apical) it is regarded as [–continuant]. Compare this situation with that of /r/. While often grouped with /l/ and nasals to form the class of soronants it shows a crucial difference with respect to these latter segments in not forming a point of oral closure. In the specific case under consideration here what is significant about /r/ is that the apex of the tongue does not form contact with the alveolar ridge (i.e. /r/ = [ɹ] One would then expect that /r/ would not block the fricative realization of /t/, which in fact it does not when preceding /t/.

(12)   *flirt*   [flɚt̠]

The situation when /r/ follows is not as clear cut. In those cases where /r/ is really a rhotacized shwa the realization is definitely fricative (see Hickey (1989) for a description of the Irish English rhotacized shwa and *r*-coloured vowels in general). The fricative realization of /t/ is found before rhotacized shwa irrespective of whether the latter is word-final or followed by a further unstressed vowel.

(13) a. *better* [ˈbɛt̞ɚ]
      b. *flattery* [ˈflæt̞ɚi]

There is no syncope here so that the medial vowel in (13b) is not lost in allegro speech. This means that there is no contraction of /t/ and /r/ which would demand the realization [tr] as in (9a) and (9b) above. This lack of syncope applies across the board in Irish English, e.g. *police* → [pəliːs].

The examination of alveolar stop realizations inevitably leads to the question of the origin of fricativization. A notable fact is that in formal styles, such as reading a text aloud, Irish English speakers only have a stop realization of /t/ irrespective of its position to the stressed vowel of a word: fricativization is on the other hand always present in conversational speech. This fact provides a clue to the development of a continuant post-stress allophone of /t/ in the first place. Assuming that allegro speech involves a reduction in the thoroughness of articulatory movements and that this follows predictable lines one can postulate that /t/ → [t̞] is part of a more general articulatory weakening which is allowed when certain favouring conditions are fulfilled. This situation is quite different from cluster simplification, which leads to loss of /t/ or /d/ in many trisegmental sequences in English such as, in fricative environment, *rifts* [rɪfs], or in an internasal one *windmill* [wɪnmɪl]. Allowing that allegro speech was the cause of articulatory weakening here one may ask why did one neither have /t/ → [d], a common form of (intervocalic) weakening nor /t/ → ø the ultimate result of the lenition of a stop? Systematic considerations would seem to have played a role here. /d/ already existed as a phoneme in Irish English and also underwent the process of continuant realization (see below). The development of /t/ → ø may have been blocked for reasons of phoneme affiliation. It would have rendered an unnatural allophony as follows

(14) a. [pre-stress]   /t/ → [t]

      b. [post-stress] /t/ → ø / [+ cont] $\begin{matrix} \text{[+cont]} \\ \text{\# \#} \end{matrix}$ --- {   }

and anyway spontaneous deletion of /t/ is impossible in lenition theory as it would first have to go through a fricative stage which is in fact what is attested for Irish English. Note that despite its continuant articulation [t̞] is in all other respects similar to [t] in agreement with the tendency of allophones to resemble each other maximally, natural processes (such as weakening) permitting. The allegro speech origin of [t̞] is supported synchronically by the alternative pronunciations of forms like *petrol* when spoken very quickly. Here the apico-alveolar affricate can be broken up giving the expected [t̞] after the stressed vowel despite the following /r/. Converse support is offered by the tendency in the lento style of a formal register for all instances of [t̞] to be fortified to [t] by Irish speakers of English. The contention that in this case one has code-switching to Standard English is not valid as the remaining characteristics of Irish English such as the monophthongal realization of mid vowels, the non-retraction of long /aː/ and the retention

of /r/ in all positions remain. Normal colloquial style retains continuant realization of /t/ where it shows the adoption of an allegro form into lento speech to form a general characteristic of Irish English.

The above view of the origin of [t̯] (and [d̯], see below) is an internal one. It is common however in treatments of Irish English to posit a large degree of interference (see Hickey (1986) for a treatment of the possible phonological influences of Irish on Irish English, as well as Henry (1957: 17 and 84f.); Bliss (1971: 63ff.); Adams (1967: 2 and 5)); the possibility of the fricative realization of alveolar stops being a transfer phenomenon should at least be considered. The arguments in favour of it are as follows. Irish has an elaborate system of initial mutation of consonants of which lenition is the most widespread (1.5). The origin of lenition lies in intervocalic weakening of stops (and to some extent fricatives), that is, when flanked by segments which were [+continuant]. Stops also adopted this feature leading to their fricativization, and fricatives were voiced. Additionally in favour of the transfer hypothesis is the fact (noted in Wells, 1982: 430) that /t/ can in decidedly allegro speech lose its alveolar friction entirely, leaving slight glottal friction as the trace of the underlying stop.

(15) a. *It doesn't matter*   [dəzmæhə]
      b. *Did you get her?*   [dʒəgɛhɚ]

/h/ is however the lenited form of /t/ in Irish as well so that this offers a parallel not only in respect of the process but (for the style described) of the manifestation also. A difference between lenition and fricativization of /t/ is that the former arose only when flanked by segments which were both [+continuant], that is, lenition did not originally occur in post-vocalic, word-final position where fricative realization of /t/ is found in Irish English.

There are serious objections to the interference view, however. First of all there is no lenition of /t/ in contact Irish English. Secondly the usual manifestation of lenited /t/, [t̯], does not occur anywhere in Irish. Thirdly lenition is a morphophonemic process in Irish which is used to indicate grammatical categories. It has been denaturalized from its phonetic motivation almost since the earliest records of Old Irish. Lenition is only found in citation forms sporadically in present-day Irish with a small group of permanently unstressed grammatical words.

Maintaining now that in all cases where /t/ is preceded by a segment which involves apico-alveolar contact there is no continuant realization of /t/ would cover the cases considered so far but not such instances as the following:

(16) a. *past*   [paːst]
      b. *pushed*   [pʊʃt]

where the segment which precedes the /t/ is [+continuant]. It is also clear that the fact that /s/ and /ʃ/ are homorganic to /t/ (or rather to its allophones after these consonants) plays no role here. There is no fricative realization of /t/ after heterorganic stops of fricatives either.

(17) a. *pact*   [pækt]
      b. *rift*   [ɹɪft]

Now although the continuant [t̯] is an allophone of /t/ and as such is on a rather low

phonetic level, its distribution seems to be governed by higher phonological considerations. These can take the form of a favouring condition and a restriction. The former can be given formulaically as follows.

(18)   [post-stress]   /t/ → [t̪] / [+cont] ——

To this must now be added a restriction which is based on the phonotactics of Irish English.

(19)   Sequences of two fricatives are disallowed.[3]

This would account for stop realization in (16) and (17b) but it might be countered that Irish English has similar consonant structures to Standard English, where double fricative sequences are common in forms such as *sphere*, *twelfth*, etc. These cases, also to be found in Irish English, can none the less be accounted for. Words of the *sphere* type are classical loanwords which have introduced the phonotactics of the donor language into English, just as the accentual system of Latin has been carried over into English to a certain degree (Halle and Keyser, 1971: xiii). With *twelfth* a different situation obtains. Here one has a native word but with a morpheme boundary between the two fricatives, with the ordinal formation morpheme /θ/ being suffixed despite the final fricative of /twelv/.[4] Triple fricative sequences all contain morpheme boundaries between their members as can be seen from

(20)   *twelfths* = {twelv} + {θ} + {s}

The twin considerations of donor language phonotactics and intermorphemic sequential possibilities would incidentally also account for the non-occurrence of double plosive sequences in English.

The restriction formulated in (19) has two possibilities as its domain. The first is that seen in (16) and (17), where the fricative precedes the /t/, the second is where it follows.

(21)   a.   *pits*   [pɪts]
           b.   *pity*   [pɪt̪i]

There are a number of further cases where /t/ is both after a stressed vowel and followed by a further consonant. The forms here involve an unreleased /t/; the segment which follows here is either a lateral or a nasal. Again the /t/ can come immediately after the stressed vowel or be separated by up to two intervening unstressed syllables.

(22)   a.   *kettle*   [ˈkɛt̚l̩]

           b.   *button*   [ˈbʌt̚n̩]

           c.   *fortunately*   [ˈfɒɹtʃunət̚li]

The final case to be considered is that where /t/ occurs morpheme-finally but word-internally in polymorphic forms. Here the conditions given above operate exactly as expected. Before plosive-initial morphemes it has a stop realization, before continuant-initial morphemes a fricative one, something which is neatly illustrated by the following set of forms.

(23) a. *football* [ˈfʊt©bɒːl]

     b. *footman* [ˈfʊt©mən]

     c. *footnote* [ˈfʊt©noːt̪]

     d. *footgear* [ˈfʊt©giɹ]

     e. *footwear* [ˈfʊt̪©weɹ]

It will be of course have been noted that I have only dealt with the voiceless member of the pair of alveolar stops in English. This has no theoretical significance. The continuant realization of /t/, the conditions for, and the restrictions on its occurrence apply equally to /d/. Auditively the impression of fricativization with [d̪] is not as clear as with [t̪] as it is lenis, and consequently the noise of the friction is slighter. Examples of [d̪] are:

(24) a. *bad* [bæd̪]

     b. *bidder* [ˈbɪd̪ɚ]

     c. *faded* [ˈfeːd̪ɪd̪]

2.2 *Ambidental fricatives, alveolar and dental stops*

The first two segments under consideration here, Standard English /θ/ and /ð/, show like /t/ and /d/, differing realizations according to position. The two basic possibilities are that they are realized as [θ] and [ð] or [t̪] and [d̪]. The fricatives and the dental stops can be in free variation in medial and final positions.

(25) a. *with* [wɪt̪] ~ [wɪθ]

     b. *weather* [weˈd̪ɚ] ~ [weˈðɚ]

Initially only the stop realizations are found

(26) a. *thigh* [t̪ae]

     b. *thirty* [ˈt̪ɚt̪ɪ]

     c. *this, that* [d̪ɪs], [d̪æt̪]

For many speakers of urban middle class Irish English and generally in more colloquial varieties a fricative realization of Standard English /θ/ and /ð/ is never found. In these cases dental stops then have phonemic status. In intermediate cases speakers may have a fricative for the voiceless phoneme, but not for the voiced one. The reason for this is that the former occurs in lexical words while the latter is found not just only in grammatical words but also in initial position, where the plosive is always the realization which is found. Intervocalically the voiced phoneme is restricted to a few forms such as that in (25b) and finally to even fewer forms, despite the existence of contrasting pairs such as

(27) a. *teeth* [tiːt̪] (n.)

     b. *teeth* [tiːd̪] (v.)

The result of this situation is that fricatives are occasional variants of dental stops. This

fact has led with Irish English speakers to a specific awareness of the difference between dental and alveolar stop articulations, which are carefully kept apart;5 compare

(28)   a.   *thank*   [t̪æŋk]
        b.   *tank*   [tæŋk]

Proof of the awareness and maintenance of this distinction is seen in the stigmatization of the neutralization of [t̪] and [t] as it is found in rural forms of Irish English. The neutralization here is always to the alveolar articulation.

(29)   a.   *thinker*   [tɪŋkɚ]
        b.   *tinker*   [tɪŋkɚ]

A further deviation from Standard English is apparent in certain phonotactic environments. This concerns the realization of /t/ and /d/. When they occur before /r/ they may have a dental realization. With reference to syllable structure there are two positions involved.

(30)   a.   /t/ → [t̪] $\left\{ \begin{array}{c} / - V/r/\$ \\ \\ \$ - /r/V - \end{array} \right\}$
        b.

The formalism in (30a) requires some comment. While phonologically /t/ is followed by a vowel plus /r/ phonetically the /t/ is followed by a rhotacized central vowel [ɚ] so that both (30a) and (30b) are cases of /t/ followed immediately by /r/. With (30a) the phonemic vowel before which /t/ occurs is unstressed.

(31)   a.   *water*   [ˈwɒːt̪r]
        b.   *drink*   [d̪rɪŋk]
        c.   *turn*   [tɚn]

Not only is /t/ realized as [t̪] before /r/ but /r/ assumes an allophone different form its normal one.

   Usually in Irish English /r/ has the same realization as in Standard English, viz. an alveolar frictionless approximant and a fricative after an alveolar stop (/t/ or /d/). But after dental stops a trilled /r/ occurs. This is voiceless after [t] and voiced after [d]. The origin of this lies in the Bernoulli effect, whereby the apex of the tongue which lies at an angle to the escaping air after the dental release of the stop is made to vibrate rapidly, striking the region immediately behind the teeth several times in the process.

   Note that there is a two-way influence here. The dental and alveolar stops are neutralized before /r/ with the dental stop occurring alone as opposed to the usual direction of (context-free) neutralization (see (25) above). On the level of phonetic realization /r/ has an allophone (a trill) which is only found in this environment. /r/ causes dentalization of alveolar stops and is itself altered allophonically by the dental stops it has given rise to. Needless to say, where the stop was originally dental there is only a one-way influence (approximant to trill) as in *weather* [wɛd̪r].

   This dentalization of alveolar stops and the subsequent trilling of /r/ is a common characteristic of lower-class Dublin speech and that of other cities. Bertz (1975: 269-294) gives a long list of words and a series of remarks on the realization of coronal

stops and ambidental fricatives (not phrased as such). But despite the thoroughness of the treatment it remains a taxonomy as he does not give any principled criteria for the distribution of the various sounds. He also comments on trilled [r] (his [R], 1975: 308f.) but without determining the regularities of its occurrence and non-occurrence. This is not to say that dental realization of alveolar stops is unknown outside urban centres. In fact it occurs in contact English as the realization of alveolar stops (Henry, 1957: 37f.) with the expected distribution: for Standard English /θ/ and /ð/ and before /r/ (Henry, 1957: 55-57). This fact would seem to offer a (diachronic) account of dentalization in lower-class urban speech. Originally both ambidental fricatives and dental stops were realized as dental stops (and are still transferred as such into Irish today, see Hickey, 1982: 148f.). With increasing Anglification the sound inventory of Irish English became further removed from that of Irish. Various features of Irish phonetics were lost such as the palatal and velar quality of consonants. Along with this went the adoption of alveolar stops, but not when they represented ambidental fricatives or were followed by /r/. This is the state described by Henry for the then recently de-Gaelicized North Roscommon area and which still exists for lower-class speech in urban centres.

2.3 *Alveolar fricatives*

2.3.1 *Narrow grooved*

The realization of alveolar fricatives in Irish English is unproblematic and identical to that of Standard English. The articulation of both /s/ and /z/ with the apex of the tongue below the lower teeth and the blade raised towards the alveolar ridge is one which is present allophonically in Standard English beside that where both apex and blade are raised to the alveolar ridge. It may be however that the placing of the apex below the lower teeth might be a deliberate articulatory gesture to maximize the difference between /s/ and [t̺] as the latter has a raised-apex articulation.

2.3.2. *Broad grooved*

The two fricatives transcribed as /ʃ/ and /ʒ/ are mentioned here under the heading alveolar although their articulation does normally involve the raising of the front of the tongue body towards the palate. However, it is the width (and length) of the groove which is the determining factor with these fricatives.

It is mainly the length and width of constriction which separates these fricatives from the continuant realizations of /t/ and /d/. Pairs of words such as *push* and *put* are distinguished additionally by lip-rounding for the broad-grooved fricative. There are no instances of merger of these sounds in Irish English.

3   Phonological interpretation

For southern Irish English in respect of coronal segments (non-sonorants) one can recognize four phonological arrangements. The most common is in fact the most complex. The reason for this is that it has maintained the same number of distinctions as Standard English but through the fortition of ambidental fricatives to dental stops has gained an additional distinction among non-continuant coronal segments. Consider the four systems.

(32)   general urban middle-class Irish English
        /t/, /d/ [t] [t̪]; [d] [d̪]
        /t̪/, /d̪/ [t̪] ([θ]); [d̪] ([ð])
        /s/, /z/
        /ʃ/, /ʒ/ (/tʃ/, /dʒ/)

(33) a.   rural and lower-class urban (i)
        /t/, /d/ [t] [t̪]; [d] [d̪]
        /s/, /z/
        /ʃ/, /ʒ/ (/tʃ/, /dʒ/)

(33) b.   rural and lower-class urban (ii)
        /t/, /d/ [t] [t̪] [t̪]; [d] [d̪] [d̪]
        /t̪/, /d̪/ [t̪] [d̪]
        /s/, /z/
        /ʃ/, /ʒ/ (/tʃ/, /dʒ/)

(34)   contact English
        /t̪/, /d̪/
        /s/, /z/
        /ʃ/, /ʒ/ (/tʃ/, /dʒ/)

It should be said that the position in contact English is not quite so clear cut. While English alveolar stops generally appear as dental stops, in those cases where the English word is homophonous with an Irish word alveolar articulation is retained. This applies particularly to English words which are also loanwords in Irish, e.g. (English) *tea* [teː] and (Irish) *(an) té* [(ə) tʲeː] 'he who, whoever' (de Bhaldraithe, 1945: 26f.).

The allophony of /t/ and /d/ in the system of (32) means that on a phonetic level a complex set of coronal fricatives is to be found. Note that there is no overlapping at all. Both /s/ and /ʃ/ are kept firmly apart from [t̪] < /t/.

(35) a.   *puss*   [pʊs]
      b.   *push*   [pʊʃ]
      c.   *put*   [pʊt̪]

In those varieties where /t̪/ and /d̪/ may have a fricative realization there is no falling together with [t̪] either.

(36) a.   *pith*   [pɪθ]
      b.   *pit*   [pɪt̪]

The arrangement under (33a) applies to those varieties which have neutralized dental to alveolar articulations, i.e. they have a *thank = tank* merger. They do not have dentalization before /r/ either (*butter* [bʌt̪ɚ]).

The third arrangement has the same number of segments as the first but has overlap with dental stops as these occur as the realization of alveolar stops before /r/ as in

(37) a.   *lather*   [laːd̪r]
      b.   *ladder* [læd̪r]

It is not possible to subsume the dental stop in forms like (37*b*) under the dental stops which occur in a context-free position (i.e. which corresponds to Standard English /θ/ and /ð/) as they are related directly to alveolar stops through morphophonemic alternation.

(38) a.   *mad*   [mæd]
      b.   *madder*   [mæd̪r]

The arrangements of (34) and (33a) are similar in terms of phonemic complexity, the former showing only the dental stops which derive from Irish.

3.1 *Feature description*

If one attempts to capture the distinctions observed above within the framework of canonical distinctive feature system of Chomsky and Halle (1968), then one encounters certain difficulties. The distinctions I am concerned with (disregarding voice for the present discussion) are:

(39) a.   [t̪] ≠ [s]
      b.   [t̪] ≠ [t̪] ≠ [t]

Both of the above contrasts occur in words which form minimal pairs. Now, while one could conceivably avoid an attempt at ta distinctive feature description of the contrast of (39a) by a traditional reference to the phoneme affiliation of [t] to /t/ and thus differentiate /t/ and /s/ from each other, with the contrast in (39b) no such facile solution is possible as the distinction operates on the home ground of generative phonology, in morphophonemic alternations.

(40) a.   *fat*   [fæt̪]
      b.   *fatter*   [fæt̪r]

As noted above, the difference between [t̪] and [s] is that between an apical and a laminal alveolar fricative. There are two possibilities within the standard distinctive feature framework of distinguishing the two sounds. The first is to use the term [−strident]. According to this [t̪] would be [−strident] and [s] [+strident] in agreement with the value for [strident] which [s] has in generative phonology (Chomsky and Halle, 1968: 329). But this is untenable as Chomsky and Halle describe strident sounds as those which have an angle of incidence closer to ninety degrees (the reference point for determining this angle is the escaping airstream under the alveolar ridge), and according to that [t̪] would be [+strident] and [s] [−strident], as the angle of incidence with the active articulator, the apex, is nearer ninety degrees (for [t̪]) than with the blade (for [s]). The term [strident] is not defined in precise phonetic terms but is assigned to certain segments with an arbitrary dividing line. It might be subjectively acceptable to label [θ] [−strident] and [s] [+strident] for Standard English. By this I mean that the acoustic impression of [θ] is one of lower amplitude friction than [s]. This cannot be said for [t̪] however. It does have a lower limit for noise than [s] but the essential acoustic difference between it and [s] is caused by the resonance of the escaping airstream in the area between the underside of the raised apex and the teeth during its articulation. This

resonance is very much less with [s] as the apex is then behind the lower teeth and the volume of the area between the alveolar ridge and the teeth is very much reduced.

To then label [s] [–strident] and [t̪] [+strident] for Irish English would be mere ad hoc manipulation of a feature which would be without phonetic justification. The additional characteristics of strident sounds, as having, 'a rougher surface, a faster rate of flow' (Chomsky and Halle, 1968: 329) are of no value for the distinction to be treated here.

The second possibility looks more promising. It is to classify [t̪] as [–distributed] and [s] as [+distributed]. The length of the constriction for [s] is indeed greater than for [t̪] and this feature would work for this alone as [t̪] would be [–distributed] and [s] [+distributed].

The difficulty arises with the contrasts in (39b) above. Assuming that in a phonological system one cannot use now one feature, now another to characterize the same sound one must label [t̪] in the contrast [t̪] ≠ [t̪] as [–distributed]. Now [t̪] must also be characterized as [–distributed] as it is an apico-dental stop (and not a lamino-dental stop as is dental [t̪] in Swedish, for example); the two sounds here would be labelled as follows

(41) a. [t̪] = –distr
              +cont

       b. [t̪] = –distr
              –cont

The label [–distributed] for [t̪] must be retained, and when one comes to the alveolar stop, the second half of the contrast in (39*b*), one sees that there is now no distinction between [t̪] and [t].

(42) a. [t̪] = –distr
              –cont

       b. [t] = –distr
              –cont

A distinction with the feature [anterior] is not possible either a English [t] is obviously [+anterior] as is Irish English [t̪] as well. This situation was not foreseen by Chomsky and Halle as the languages which they investigated had a definite correlation between two points on the passive articulator (between the alveolar ridge and the upper teeth) and laminal versus apical articulation with the tongue (see table in Chomsky and Halle, 1968: 313). The only solution to this is to divide the upper passive articulator into regions (as suggested by Ladefoged (1982: 38ff.) when considering, among other languages, Malayalam, which also has a dental ≠ alveolar distinction among consonants). These regions are the traditional divisions of the upper passive articulator, i.e. dental, alveolar, etc. This would give:

(43) a. [t̪] = +dental
              –cont

       b. [t] = +alv
              –cont

Such a description involves a degree of redundancy id simply added to the Chomsky and Halle system and can be described more economically as:

(44) a.
$$[\underset{.}{t}] = \begin{matrix} -alv \\ -cont \\ +ant \end{matrix}$$

   b.
$$[t] = \begin{matrix} +alv \\ -cont \\ +ant \end{matrix}$$

because [–alv, +ant] would delimit [t̩] sufficiently from [k] and [–alv, +cor] would separate it from [p] which would be [–alv, –cor]. But the introduction of an alveolar point of articultion on the upper articulator as a distinctive feature would be an uncomfortable addition to the standard system of distinctive features as it would suggest a set of such points (as given in Ladefoged 1982: 40 for example) and upset the method of grouping such points of articulation variously under features like [anterior] and [coronal].

An alternative set of distinctive features according to place of articulation involves three basic questions. The first concerns features like [high], [low] and [back]. The obvious advantage of these is that they can be used to describe vowels and consonants and so one can capture generalizations involving the determination of vowel quality in a given consonantal environment and vice versa. Giving up this system for one where the features refer to points on the upper passive articulator for consonants obscures the frequent interrelationship of vowel and consonant realizations.

The second question concerns the use of features with an unrelated articulatory basis. The features [anterior] and [coronal] have nothing in common articulatorily. The former divides the upper passive articulator at an arbitrary point and the latter refers to the front part of the tongue as an active articulator. The standard distinctive feature system does not allow one to classify sounds on the basis of the passive articulator alone.

The third question concerns the use of alternative features to capture generalizations not provided for within the standard system. The classic example here is the feature [grave] which is justified on the basis of many diachronic shifts such as /x/ to /f/ in Germanic languages.

Depending on how one weighs these three considerations in distinctive feature theory one will favour one system as opposed to another. The various proposals for alternative systems to the canonical one of Chomsky and Halle (1968) all capture generalizations of some sort. [grave] links up peripheral articulations; [labial] can be used to describe the rounding effect of labial consonants on vowels. There are also arguments in favour of a series of places of articulation on the upper passive articulator. The pros and cons will vary from system to system but they will also vary in terms of the kind of phenomenon a newly proposed system will account for. [labial] would cover the retraction of /a/ to /ɒ/ after /w/ in Early Modern English, [grave] would cover the shift of /k/ to /p/ in Rumanian, of /ɣ/ to /v/ in Russian genitive inflections, etc.

The use of a feature [alveolar] would cover the synchronic morphophonemic alternations in (40a) and (40b). This is obviously a different phenomenon from the diachronic developments just mentioned. There are in fact yet more kinds of phenomena which features referring to place of articulation would cover. Consider the forms in (40) again. The [t̩] ~ [t̪] alternation is morphophonemic. I am using this term in a narrow sense here. It refers to a segmental change which accompanies a morphological alternation. The [t̯] ~ [t̪] alternation does not itself indicate the categories positive and

comparative respectively for adjectives; this is done by the suffix. However, in Irish for example changes in place if articulation indicate altered grammatical categories. The alternation of /t/ and /t^j/ means a change from nominative to genitive in *cat* /kat/ 'cat' ~ *cait* /kat^j/ 'cat' for example; there are similar alternations between velars and palatals (/k/ and /k^j/) between labials and palatalized labials (/p/ and /p^j/). The implication of this is that for the speaker of Irish every consonantal segment, irrespective of its articulation, is marked with a value for the feature [palatal] which carries semantically essential information. There is evidence that the value for [palatal] is stored apart from the remainder of the phonetic information needed for the articulation of a segment. If two segments undergo metathesis the value for [palatal] does not change with the segments as this would imply a change in grammatical category which metathesis in Irish never involves.

(45)　　　*foláir* /fʌlɑːr^j/ → *foráil* /fʌrɑːl^j/ 'necessary'

The conclusion to be drawn from this is that the lexical storage of phonological segments is unlikely to use the distinctive features in their canonical form (a rather extreme claim anyway) and that certain aspects of phonetic segments have a quite different status for speakers of a given language. For Irish this would mean that the feature [palatal] cannot be described by the combination of the features [+high], [–low] [–back] (Chomsky and Halle 1968: 307) as these features would be used to describe velars also, and there is a considerable difference between the status of the information conveyed by the value for [palatal] and that which specifies a velar articulation in Irish. Additionally some segments, e.g. palatalized velars, would require a positive value for [palatal] and still demand basic identification as velars to account for morphological alternation with non-palatalized velars. The only solution to this is to hive off the feature [palatal], assigning it to the level of morphology, and to leave other features on the phonological level. But even with this one is quite far from the unitary system of description found in standard generative phonology. This setting apart of a feature would incidentally also apply to the feature [voice] in English, although conclusive evidence as in the case of metathesis in (45) is not found because the feature [voice] cannot be separated from a segment in English as [palatal] is in Irish. If distinctive features are a metaphoric means of describing the constituent structure of phonological segments, then the standard feature system can be revised to include places of articulation without severe theoretical repercussions, if this serves the purpose of economy and elegance of description in the language variety under investigation.

Notes

[1] The data for discussion below partly reflect the speech of the present writer and partly are culled from a series of tape-recordings of speakers of Irish English who belong to the urban middle class. With the recordings two styles were used, the first a colloquial one obtained from free conversation and the second a more formal register used by speakers when reading a literary text. It is interesting that with the latter the fricativization of alveolar stops disappeared with almost every speaker.

[2] A fuller treatment of stress and syllabification and the relation between them in Irish English is given in Hickey (2010)*.

[3] This is a restriction which applies within syllable boundaries. However, as I do not

regard a treatment of the issue at hand in terms of syllable phonology to be a gain in descriptive adequacy (see the comments above). I will not refer to syllable structure in the present discussion.

[4] The validity of the principle being discussed here can be seen from its operation across a morpheme boundary in Old English in some cases, e.g. *theft* (< *þēof* + *þ*) which has been retained into Modern English, see Hickey (in press (b)). See also Selkirk (1982: 381) for a discussion of these and similar forms.

[5] A phonemic contrast between dental and alveolar stops is not found among the better-known European languages but is among others, such as certain Australian languages; like Guugu Yimidhirr (see Dixon (1982: 132ff.) for a description of this and the difficulties of perceiving the difference between dental and alveolar stops which English speakers have). Among Dravidian languages three pre-palatal points on the upper passive articulator are recognized: dental, alveolar and retroflex. While most Dravidian languages have stops at the first and third point, at least Malayalam and Toda (Andronov 1970: 35; Emeneau 1958) have a phonemic distinction between dental and alveolar stops.

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* Addition to original text of article.