

A Phonological Conspiracy on the Ground

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This paper is a defence of the practice of wearing two hats, of approaching data simultaneously from two rather different points of view. Formal linguistic analysis alone produces interesting results, as does the study of dialectal variation. But, combined, the two approaches reinforce and illuminate each other strikingly. The geographical distribution of forms can provide independent confirmation of the formal account suggested, while the formal account provides a motivated explanation of why certain patterns of distribution are found.

In support of this claim I shall present some data from Welsh.¹ The central vowel schwa /ə/ is subject to some highly idiosyncratic phonotactic restrictions in most of South Wales and in one area, North Pembrokeshire, it is dropped altogether. Lexical items which elsewhere contain schwa have instead one of the high vowels /i:/, /ɪ/, /u:/, /ʊ/.² The choice of which high vowel shows up in each case is determined by a number of different considerations.

I shall argue below that the relation between the normal run of dialects in South Wales and the dialect of North Pembrokeshire can be captured by a modified version of the concept of a 'phonological conspiracy'. This concept was first developed by C. W. Kisseberth (1970) to handle certain relationships between phonological processes within a single dialect. Here it is extended somewhat to handle similar relationships between one dialect and another. I shall then argue that the geographical distribution of forms in North Pembrokeshire provides independent support for this formal analysis.

1. The Normal Pattern in South Wales

Schwa vowels in the dialects of South Wales derive from two different sources. In morphologically simple forms the schwa is part of the basic lexical item.

'əs·kol	(school)
kə'nej·a	(harvest)

In morphologically complex forms however the schwa is not basic. A high vowel in a monosyllable or in the final syllable of a longer form changes to schwa if an inflection is added.

'pri:v	(fly)	'prəv·ed	(flies)
'kʊsk	(sleep)	'kəs·ki	(to sleep)
'gɔ·vin	(to ask)	gɔ'vən·oð	(he/she asked)
'mɛ·ðul	(to think)	mɛ'ðəl·joð	(he/she thought)

The Centralisation Rule which carries out this change will not be formulated in detail here. The only relevant point to note is that it does not apply uniformly in all cases. Some lexical items do undergo the rule, but others do not although apparently identical. They retain the original high vowel even when an inflection is added.

'pi:g	(beak)	'pi:go	(to peck)
'ʊrθ	(to)	'ʊr:θi	(to her)
'ε·gin	(sprout)	ε'gi·no	(to sprout)
'tej·lur	(tailor)	tej'lʊr·ja	(to work as a tailor)

Since there is no obvious difference between these two sets of forms it appears that each lexical item must be marked with a rule feature specifying whether it does or does not undergo the rule.

'pri:v	'pi:g
[+ Centralisation]	[- Centralisation]

These schwa vowels, from both sources, are subject to two highly idiosyncratic phonotactic restrictions that do not affect other simple vowels.

- i) Schwa may not appear in a word-final syllable.
- ii) Schwa may not appear immediately followed by another vowel.

These restrictions are illustrated in Tables 1 and 2 below. We see that schwa is limited to nonfinal syllables and to those environments where it is immediately followed by a consonant.³ High front vowels on the other hand are not restricted in this way and appear freely in all contexts.

Table 1

Syllable in Word	High Front Vowel	Schwa
Penultimate	'i·gen (twenty)	'əs·kol (school)
Antepenultimate	mɪ'həŋ·el (St Michael)	kə'nej·a (harvest)
Final	'wε·din (then)	
Monosyllable	'di:n (man)	

Table 2

Followed by:-	High Front Vowel	Schwa
Consonant	'i·gen (twenty)	'kən·ar (early)
Cluster	'mɪt·tir (mile)	'əs·kol (school)
Vowel	'ti·en (cloth)	

How then should these restrictions be expressed? If the morphologically simple forms are accounted for by morpheme structure conditions holding at the systematic phonemic level we shall miss a generalisation. It will be necessary to account separately for complex forms, by for instance imposing appropriate constraints on the application of the Centralisation Rule, and this makes it appear an accident that the restrictions on the simple and complex forms are identical. If we are to capture the generalisation that the two sets of forms are restricted in exactly the same way then some other strategy will be needed.

Fortunately there is a formalism which will allow us to do so. A surface output constraint, holding at the end of the derivation, affects all forms regardless of their derivational history. It can impose the appropriate restrictions on simple and complex forms alike; only those forms which conform to its requirements will be accepted, and anything contravening them will be rejected as ungrammatical.⁴ Accordingly we shall adopt this solution and assume the existence of a surface output constraint on the lines of that shown below.

Surface Output Constraint

Schwa: Not OK { in a word-final syllable
 { followed by a vowel

2. Pembrokeshire

The pattern outlined above holds for most of South Wales. In one area however, North Pembrokeshire (see Map 1), the position is markedly different. Here schwa is almost entirely lost from the dialect, and in those lexical items where it would normally appear we find instead one of the high vowels.

Most of South Wales

'əs·kol (school)
 'kræv·aχ (stronger)
 'pəm·θeg (fifteen)
 'dər·ni (to thresh)

Pembrokeshire

'ɪs·kol
 'kri·vax
 'pʊm·θeg
 'dʊr·ni

At first sight the choice of a front or back high vowel to replace the schwa seems random, but on closer examination we find two distinct trends working alongside each other.

So far as morphologically complex forms are concerned this shift reflects the loss of the Centralisation Rule. Lexical items which elsewhere in South Wales undergo this rule when an inflection is added here fail to do so. As a result the basic high vowel of the uninflected form is not converted into schwa but rather appears in the surface output.

'kri:v	(strong)	'kri·vax	(stronger)
'dʊrn	(fist)	'dʊr·ni	(to thresh)
'kɛ·fil	(horse)	kɛ'fi·le	(horses)
'faʃ·un	(fashion)	fa'ʃu·nol	(fashionable)

Elsewhere in South Wales the inflected forms of these items contain schwa - 'krəv·əχ, 'dər·ni, kɛ'fəl·ə and fə'fən·ol. Note that there is no difficulty here in explaining why we find a front vowel in some cases and a back vowel in others. This is determined quite straightforwardly by the identity of the vowel in the uninflected form.

Since we have already established that these lexical items must be marked in the normal way with a rule feature specifying that they undergo the Centralisation Rule, all that is needed to formalise the shift is a change in the value of this rule feature from + to -. Lexical items that are marked [+ Centralisation] in the rest of South Wales are in Pembrokeshire marked [- Centralisation].

Most of South Wales

'kri:v

[+ Centralisation]

Pembrokeshire

'kri:v

[- Centralisation]

In morphologically simple forms there is a rather different process at work. The choice of which high vowel replaces schwa here is determined by the consonantal environment. If there is an alveolar consonant either immediately before or immediately after the vowel concerned then schwa is replaced by a front vowel.

alv - alv	'sɪn·wɪr	(sense)
- alv	'ɪn·ɪs	(island)
alv - lab	'r _ə ·i·vel	(war)
alv - vel	'tɪ·gəd	(eye)
lab - alv	'vɪn·ɪχ	(often)
vel - alv	'kɪn·ɪg	(offer)

If there is no alveolar consonant in the immediate environment then the schwa is replaced by a back vowel.

- lab	'ʊm·lə	(to fight)
lab - vel	'bu·guθ	(to threaten)
vel - lab	'kʊm·rɪd	(to take)
lab - lab	'pʊm·θeg	(fifteen)

This shift from schwa to a context-determined high vowel can be formalised as a phonological rule with a mirror image environment.

Central-High Shift

V	->	{	V	/	C
[+central]		{	[+high]		[+alv]
		{	[+front]		
		{			
		{	V		elsewhere
		{	[+high]		
		{	[-front]		

3. The Conspiracy

It appears then that two distinct processes contribute to this shift. One of them affects morphologically complex forms and involves the loss of a phonological rule. The other affects simple forms and involves the addition of a rule. Yet in spite of these differences it is clear that they are closely related, aiming at the same end product - the replacement of schwa by one of the high vowels.

This sounds very much like a 'phonological conspiracy' of the kind outlined by Kisseberth, where formally distinct processes are triggered by the same overall motivation. It is not in fact clear however if what we have here is an example of a conspiracy. Conspiracies are normally motivated by phonotactic constraints, with different rules 'conspiring' to produce the appropriate output forms. Kisseberth's own example for instance has a set of varied rules such as vowel epenthesis and consonant deletion all geared to ensuring that we end up with only a very restricted range of consonant clusters in the output.

It may well appear that the elimination of schwa in favour of high vowels is a rather different matter, involving not a phonotactic constraint but rather a change in the overall vowel system. On closer examination however it becomes clear that this too can be seen as a question of phonotactics.

One natural way of simplifying a phonological rule is to drop some or all of the conditions limiting its scope. It will then apply to a wider range of forms. A word which lengthens a stressed vowel in word-final position can for instance be simplified in this way to yield a more general rule which lengthens a stressed vowel in any position.

Rule A

V -> [+long] / ____ #
[+stress]

Rule A (simplified)

V -> [+long]
[+stress]

Recall now the surface output constraint formulated earlier to account for the pattern of distribution of schwa in most dialects of South Wales.

Surface Output Constraint

Schwa: Not OK { in a word-final syllable
 { followed by a vowel

If we drop the conditions on this constraint we end up with the following simplified form.

Surface Output Constraint

Schwa: Not OK anywhere

This is still a phonotactic statement, but it is equivalent to eliminating schwa from the vowel system of the dialect. If it may not appear anywhere then it is, effectively, dropped. We can argue then that Pembrokeshire differs from the rest of South Wales in having this simplified version of the surface output constraint, and that we are indeed dealing here with a phonotactic issue.⁵

The two processes described in section 2 then do form a conspiracy, motivated by a phonotactic constraint. They differ from the normal run of conspiracies however in one interesting way. Where conspiracies usually relate to a single output constraint in one dialect considered in isolation, this one relates to the shift from one constraint to another as we move from one dialect to another. We have here what appears to be a natural extension of the concept of a conspiracy, from 'static' to 'dynamic'. Compare the pattern shown below in Fig. 1 with that shown in Fig. 2.

Fig. 1

A 'Static' Conspiracy

Dialect A

{Process 1} > Output Constraint A
 {Process 2}

Fig. 2

A 'Dynamic' Conspiracy

Dialect A

forms complying with > {Process x} >
 {Process y}

Dialect B

forms complying with
 Output Constraint B

4. The Geographical Dimension

The discussion so far has been framed in purely formal linguistic terms. Is there in fact any independent support for the analysis suggested in section 3? The obvious place to look, since we are concerned here with the shift from one dialect to another, is at the geographical distribution of dialectal variants. And it turns out that this does indeed provide some independent evidence in support of the formal account.

First we must backtrack a little. We have so far implied that it is possible to draw a clear split between the different dialects of a language, with dialect A characterised by one feature, dialect B by another, and a clear division between the two. This however is something of an oversimplification. The shift from one dialect to another is always gradual, involving a transition zone where the features characteristic of one dialect are gradually replaced by the features characteristic of another. As might be expected, this is the case with North Pembrokeshire too. The loss of schwa vowels is not abrupt but gradual, and it is this transition we must now examine in more detail.

Map 2 shows the location of the five areas in North Pembrokeshire where recordings were made in the course of this study. Let us look in turn at the extent to which schwa is lost in morphologically simple and complex forms in each of them.

The changeover from schwa to high vowels in simple forms is shown in Fig. 3.⁶ If we look at those lexical items that would normally have schwa elsewhere in South Wales we find that in Trefdraeth only a small proportion have shifted to high vowels. In Llanfyrnach a greater proportion have done so. And in the western districts the great majority have shifted. As a check the figures were calculated separately for those items where the shift is to high front vowels and those items where the shift is to high back vowels. Clearly the transition is operating at the same rate in both sets.

The corresponding changeover for complex forms is shown in Fig. 4.⁷ These are items which would normally elsewhere in South Wales have a schwa when an inflection is added, but which in Pembrokeshire retain the high vowel of the basic uninflected form. With one exception the pattern here is very similar to that shown for simple forms in Fig. 3. Once again only a small proportion of forms have shifted in Trefdraeth. In Llanfyrnach rather more have done so, and in the three western districts the great majority have shifted. The one point where this parallelism breaks down is that in Trefdraeth we find an unexpectedly high proportion of forms shifting when the basic vowel of the uninflected form is back.

What then are the implications of this data? If the changeover in simple forms can be accounted for by the addition of a rule, Central-High Shift, then the curve in Fig. 3 represents the gradual spread of this rule. Similarly if the corresponding changeover in complex forms can be accounted for by the loss of a rule, Centralisation, then the curve in Fig. 4 represents the gradual dropping of this rule. Clearly the two curves are very similar; the one rule is spreading at very much the same rate as the other is being dropped.

At first glance there is no reason to expect these two very different processes to occur in such a closely parallel fashion, and the similarity might be seen as purely accidental. The formal account suggested above in section 3 however can provide an explanation for this pattern; the two processes are linked together as a conspiracy aiming at the same output constraint and it is therefore not surprising that the formal linkup is reflected in the geographical patterning.

5. Conclusions

The close link between the two processes originally proposed for formal linguistic reasons is reinforced by their distribution on the ground. And conversely the formal account is able to provide an explanation of why these two very different processes should display such similar patterns of distribution. The insight arising from each of the two approaches can be incorporated in an overall account of much greater generality.

Footnotes

1. The material presented in this paper forms part of a full length study of the phonology of North Pembrokeshire Welsh which is in preparation. [Since published as G. M. Awbery, *Pembrokeshire Welsh: a Phonological Study*, National Museum of Wales (Welsh Folk Museum) 1986]
2. In all dialects of Welsh vowel length enters into complex patterns of contrast and neutralisation. These are irrelevant to the present discussion and will therefore be ignored in what follows. I shall refer to high front vowels and high back vowels without specifying if they are long or short in each case.
3. A small number of grammatical forms are exceptional in failing to observe these restrictions. All are monosyllabic and some have no consonant immediately following the schwa. Examples of this are:- $\text{ə}r$ / ə (the), ən (continuous aspect marker), də (thy).
4. For a discussion of the motivation for surface output constraints and possible formalisms see Shibatani (1973) and Sommerstein (1974).
5. Note that this formalism allows us to explain why it is that schwa rather than some other vowel is lost in North Pembrokeshire. Only schwa is subject to the kind of output constraint whose simplification naturally yields this result.
6. The figures on which this diagram is based have been calculated using as a corpus all those forms that occur in the data and would have schwa in the southern standard language. All clear loans from English and proper names have however been omitted from the corpus. I have counted types rather than tokens, that is whether a particular lexical item appears with schwa or a high vowel but not how often it does so. This then gives a picture of the effect of the shift on the vocabulary in general, but not of the flow of speech on any one occasion. Note that I have included here not only those lexical items which have shifted completely from schwa to a high vowel but also those where there is still a doublet form with schwa.

A graph notation has been used even though not wholly appropriate to data where the horizontal axis does not consist of a continuous variable, since it allows us to show the interweaving of different scores more clearly than would for instance a histogram format.

7. The figures on which this diagram is based have been calculated using as a corpus all those forms that occur in the data and would undergo the Centralisation Rule in the southern standard language. Again types rather than tokens have been counted, and again I have included not only lexical items that have shifted completely from schwa to a high vowel but also those where there is still a doublet form with schwa.

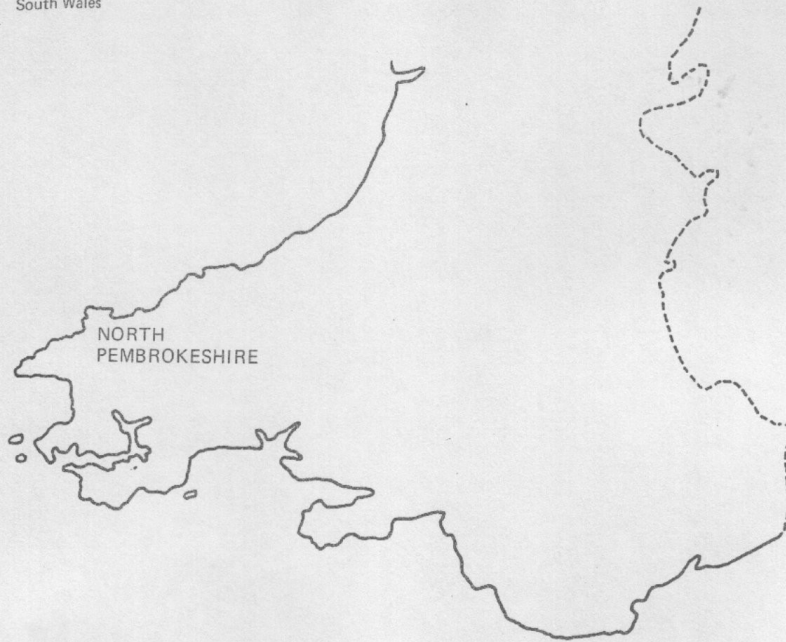
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Map 1
South Wales



Map 2
North Pembrokeshire

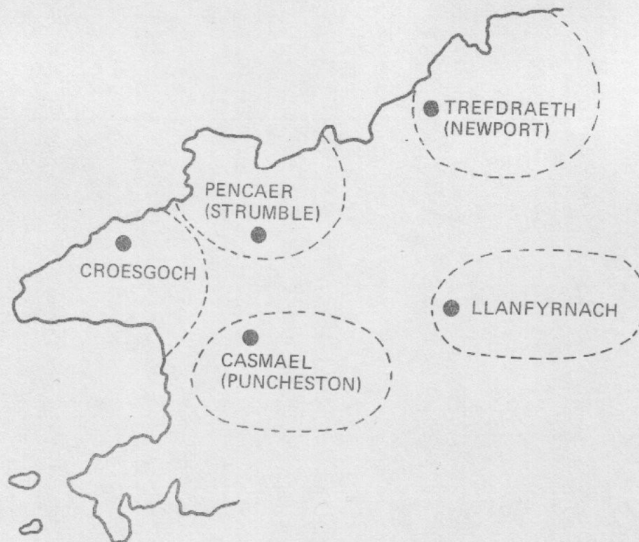


Fig. 3 Simple Forms

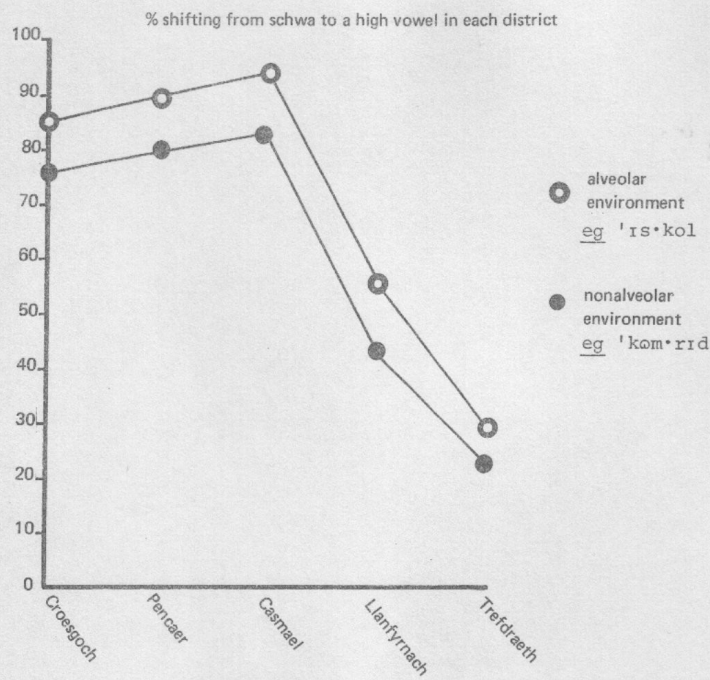


Fig. 4 Complex Forms

