CHAPTER FOUR

THE GLOTTAL PIECE

4.1 Introduction

In his most well known publication, 'Sounds and prosodies' (1948), Firth exemplifies his approach to phonology with complexes produced at the glottis or in the pharynx. In particular he has this to say about the glottal stop:

'Phonetically, the glottal stop, unreleased, is the negation of all sound whether vocalic or consonantal. Is it the perfect minimum or terminus of the syllable, the beginning and the end, the master or maximum consonant... Or is it just a necessary metrical pause or rest, a sort of measure of time, a sort of mora or matra? Is it therefore a general syllable maker or marker, part of the syllable structure? As we shall see later, it may be all or any of these things, or just a member of the consonant system according to the language' (Firth 1948,132)

Glottal activity in general has been the centre of much debate. So, for instance, Lass (1976) challenges the view of Chomsky and Halle (1968) that the glottal stop is a glide.
'The "standard" characterization of [ʔ] (SPE: 363) is an oblique challenge to the traditional term "glottal stop": and as I will show an unjustified one. Chomsky and Halle, with no discussion, assign [ʔ] to the category "glide" along with [h] and [j w]. The class itself is specified as [+sonorant, -consonantal, -vocalic].'

(Lass 1976, 145)

In many phonemic accounts of English, it is not possible to assign [ʔ] any phonological (phonemic) status at all. So, although Gimson (1980) talks about the 'Glottal Plosive' (1980, 168) alongside the 'Bilabial Plosives' (1980, 161), the 'Alveolar Plosives' (1980, 163) and the 'Velar Plosives' (1980, 166), he encloses ʔ in [] and not in //. This is hardly surprising when one examines the various functions which Gimson describes [ʔ] as having in RP utterance:

'... [ʔ] serves regularly for many RP speakers as a syllable boundary marker, when the initial sound of the second syllable is a vowel... Finally, any initial accented vowel may be reinforced by a preceding glottal stop when particular emphasis is placed on the word... As was pointed out in 8.05(3), word final /p, t, k/ and also /tʃ/ may be reinforced by a glottal closure which may coincide with the mouth closure or slightly precede it... Some RP speakers replace word or morpheme final /p, t, k/ by [ʔ] when a consonant follows, no oral closure being made.'

(Gimson 1980, 169-170)

So, despite, and because of, all these places where [ʔ] is regularly used in RP, it never attains the status of a 'significant sound in the RP system' (Gimson 1980,
and can therefore not be admitted to the phonemic system which Gimson proposes.

In Lodge's (1981) analysis of Stockport English, in the framework of dependency phonology, glottal closure is posited as a phonation type:

'>In preconsonantal and prepausal positions p, t and k have a different profile. We find what is often called 'glottal reinforcement'... To account for this I suggest a phonation type [ʔ] = closed glottis.'

(Lodge 1981, 21)

The many competing categorisations of the glottal stop in English, ranging from its phonetic characterisation and description in Gimson (1980) to the different attempts to assign it phonological status (Chomsky & Halle 1968, Lass 1976 and Lodge 1981) highlight the many functions which [ʔ] has.

In this chapter I will show that certain instances of [ʔ] in my naturally occurring material make up a small part of a complex interaction of articulatory and phonatory activity operating over a domain of a number of syllables. In describing and accounting for this activity it will become clear that discussions about the phonological status of [ʔ] are concerning themselves with a pseudo-problem. In my analysis [ʔ] is one of the possible phonetic correlates of an abstract phonological unit at
a particular place in structure, and it is pointless to treat [2] as anything more than what this symbol placed between square brackets implies: the closure, holding together for a period of time and subsequent release of the the vocal folds.

I will also use the material collected in this chapter to highlight in detail the merits of the approach I am adopting over those of the conventional analyses surveyed in Chapter One.

4.2 Initial observations

The impressionistic records in (31) are portions which have been extracted from the phonetic records, and they all have the following grammatical structure:

```
          VP
         /\  
        [neg]/
          /
        V   NP
       /\       |
      [neg]   Pronoun
```

(31)

a. don't you
b. don't she
c. don't he
d. aren't they

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e. don't it  
\[ \ddot{d} \ \underline{\Lambda} \ \dot{\underline{n}} \ \dot{\underline{\Lambda}} \ ? \]

f. isn't it  
\[ \ddot{r} \ \underline{\Lambda} \ \dot{\underline{e}} \ ? \]

g. didn't it  
\[ \ddot{d} \ \dddot{\underline{n}} \ \dot{\underline{\Lambda}} \ ? \]

At the phonetic level portions (3la-d) and (3le-g) differ with respect to the following:

(i) portions (3la-d) have intersyllabic glottal closure, accompanied by a lowered soft palate and creaky voice.

(ii) in (3lb-d) there is intersyllabic alveolar closure.

(iii) in (3le-g) intersyllabic glottal closure is absent and there is no creaky voice accompanying the first syllable, and

(iv) the first syllable is produced with a lowered soft palate and there is always brief intersyllabic alveolar closure.

One might argue that the frequent occurrence of grammatical phrases of this type has given rise to certain phonetic idiosyncrasies in such forms which do not warrant further analysis. However, the differences between portions (3la-d) and (3le-g) given in (i - iv) are based upon observations made at similar points in the portions given. If, instead, one examines the portions as wholes without reference to particular points then there are a number of similarities:

(i) each portion contains one instance of glottal
(ii) there is creaky voice in the vicinity of glottal closure.

(iii) each portion has a period of lowered soft palate.

For the moment I will leave these observations and examine another set of data which was initially thought to be unconnected with the above. The portions given in (32) represent prepositional phrases having the following structure:

```
PP[about]
   /
  Pl[about]
     /
    P
   [about] (NP)
```

(32)

a. are about (0.6)  

b. about my

c. about ours

d. about her

e. about it

f. about it and (0.6)

g. about it

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The following observations are made at the phonetic level characterising portions (32a-d):

(i) there is intersyllabic (final in 32a) glottal closure, with surrounding creaky voice.

(ii) the vocalic portion preceding glottal closure starts with a half-open front tongue position, ending with the tongue raised in a stricture of open approximation with the soft palate together with lip rounding.

Portions (32e-g) differ from (32a-d) with respect to:

(i) the absence of intersyllabic glottal closure at a similar place to where it was observed in (i) above.

(ii) the presence of a voiced alveolar tap, (32e-f), or a short alveolar plosive at this intersyllabic place.

(iii) the absence of creaky voice prior to this intersyllabic alveolar tap observed in (ii).

(iv) the absence of lip rounding and tongue raised towards the soft palate prior to the alveolar tap.

As in the case of portions (31a-g) it is equally important to compare the examples in (32a-g) in terms of similarities, i.e. all contain one instance of glottal closure together with creaky voice.
4.3 Phonology I

The patterns observed in portions (31) and (32) in 4.2 can be shown to be a systematic interaction of various articulatory and phonatory complexes operating over a domain of up to two syllables. At the phonological level I now have the task of constructing a statement. This statement must capture and reflect the patterns observed in the articulatory and phonatory activity. The phonology proposed for the data presented so far is given at (33) and (34) below.45

<table>
<thead>
<tr>
<th>Phonology</th>
<th>Example</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. [CVnq]</td>
<td>ḋ ṣ ẓ ṣ? ḳ ṣ</td>
<td>don't you</td>
</tr>
<tr>
<td>b. [Vnq]</td>
<td>ḳ ṣ ṣ ṣ ṣ ṣ</td>
<td>aren't they</td>
</tr>
<tr>
<td>c. [CVnq eq]</td>
<td>ḋ ṣ ṣ ṣ ṣ ṣ ṣ?</td>
<td>don't it</td>
</tr>
<tr>
<td>d. [Vnq eq]</td>
<td>ḳ ṣ ṣ ṣ ṣ ṣ ṣ?</td>
<td>isn't it</td>
</tr>
<tr>
<td>e. [CVq]</td>
<td>ḋ ṣ ṣ ṣ ṣ ṣ Ṣ</td>
<td>(0.6) are about (0.6)</td>
</tr>
<tr>
<td>f. [CVq]</td>
<td>ḳ ṣ ṣ ṣ ṣ ṣ Ṣ</td>
<td>about my</td>
</tr>
<tr>
<td>g. [CVq]</td>
<td>ḋ ṣ ṣ ṣ ṣ Ṣ</td>
<td>about ours</td>
</tr>
</tbody>
</table>

45 The vertical dotted lines in the records in (33) delimit very roughly most of the relevant phonetics. As in other places in this study they are only designed as a guide for the reader.
The units set up at the phonological level represent the following abstractions:

(34) 

[ ] - the glottal piece.

q - (i) piece final: on-syllable creaky phonation and syllable final glottal closure.

(ii) piece non-final: on-syllable voice and stricture of complete oral closure at alveolar ridge.

n - lowered soft palate (i.e. velic opening).

Θ - syllabicidity.

V,C - informal categories, not further specified beyond vowel and consonant.

In the phonological statement I have proposed that the glottal piece can be either one or two syllables in size, and in general terms this can be stated as follows:

(35) 

a. [$q] Monosyllabic

b. [$q eq] Disyllabic

This phonological representation captures generalisations made about the observations which have been made at the phonetic level. First, the phonetic differences observed in the same syllables can be accounted for in
terms of their place in the glottal piece. In the examples of the monosyllabic glottal piece, (33a, b, e-g), the syllable is co-extensive with the glottal piece. The syllable has creaky phonation, final glottal closure, and in the case of 'about' there is labial approximation together with back of the tongue raising at the soft palate. In the disyllabic examples, (33c, d, h-i), the first syllable is produced with voice, and intersyllabically there is always an apical articulation at the alveolar ridge. Where the syllable has velic opening (symbolised by n) the alveolar articulation is a short nasal, otherwise it is an oral tap. In disyllabic examples containing 'about', (33h-i), the labial approximation and the back of the tongue raising is absent. The final syllable in the disyllabic piece has features common to those in the monosyllabic case - on-syllable creaky phonation and syllable final glottal closure.

To this point I have shown that different tokens of the same item contained within the same syntactic structure, e.g. a prepositional phrase headed by ABOUT, exhibit different sets of features at the phonetic level; these differences have been captured in terms of the abstraction of a phonological 'phrase' (the glottal piece), where the syllables are placed differently, i.e. non-finally or finally within that piece.

I have taken care in the statement to reflect the
syntagmatic nature of the phenomenon which I have observed and described, for although it is clear that there are significant differences which are of relatively short duration, such as the different consonantal portions present at different points in utterance (e.g. [2] " [f]; [n] " Ø), it is important to stress that these features are only one part of a set of patterns which can be observed over much larger stretches of utterance (e.g. creaky phonation " 'normal' voice; on-syllable nasality; lip-rounding " absence of lip-rounding). Careless interpretation of my impressionistic records, or, worse still, any attempt at the type of systematisation which, e.g. Knowles (1978) demands one should aim for as soon as possible could easily have led to my missing the long-domain nature of the phenomenon I have identified. This could have involved paying little attention to differences in the different phonation types accompanying various vocalic strictures because the IPA is very unsystematic in its representation of this aspect, having a vibrating glottis as an integral part of many symbols and creaky phonation being represented using a diacritic.

4.4 Further data and observations

Having established the patterns in examples (31) and (32) in terms of the phonological statement presented in (33) and (34), it seemed worth investigating whether other
items exhibit similar patterns to those already identified, and, if so, whether the phonological statement proposed in the previous section provides an adequate account of the further observations. Of course, this need not be the case, since it could well be that the patterns I have observed are restricted to negated auxiliary-pronoun structures and prepositional phrases headed by ABOUT.

Finding other examples of the glottal piece involved my knowledge about syllable finality in other accents of English, together with my intuitions about syllable finality in the accent under analysis used as a guide to finding syllables which may or may not have glottal closure finally.

The portions in (36) are those which were found to have syllable final glottal closure or had on-syllable creaky phonation, and the examples in (37) are of analogous syllables in pre-IT positions.

(36)

a. keep on | kʰ i:i? pʰ ? h ʰ |

b. put a little | pʰ ʰ ? ʰ | i:i? w ʰ |

c. get them | ʰ ʱ ʰ ʰ | ? ʰ m ʰ |

d. get a lot | ʰ ʱ ʰ | ʰ ʰ |

e. what I object | ?p w ʰ i? a ʰ i | j ʰ b ʱ ʰ z ʰ ʱ k ʰ |

f. he's gonna want a wall | i i ʰ y ʰ ʰ ʰ ʰ ʰ | w ʰ s ʰ ? ʰ | w w ʰ |

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g. she won't eat anything

h. I bought him

i. hate everything

j. take her

k. not make him

l. like this

m. (I don't) even like her

n. could look a bit

o. (0.2) look of it

A number of observations are made about these portions:

(i) they all contain disyllabic portions (approximately delimited by a dotted line to facilitate reference) which have creaky phonation accompanying one or both syllables, and some have intersyllabic glottal closure (36a-c, e-j, l-o).

(ii) where intersyllabic glottal closure is present there may also be a cooccurrent oral closure, as in examples (36a,j,l,m,o).

(iii) the release of oral closure is either

(a) simultaneous with that of glottal release (36m, o),

or (b) prior to that of glottal release (36a, j),
or (c) after that of glottal release (361).

The examples in (37) show analogous syllables in pre-IT positions.

(37)

a. we'll keep it  \[ w \ I \ ]^{\text{w}} \ [ k \ I \ ]^{\phi} \ [. \ ]

b. opposite it  \[ b \ i \ p \ i \ ]^{\text{a}} \ [. \ ]

c. put it in  \[ p \ i \ ]^{\text{a}} \ [. \ ]

d. put it there  \[ p \ i \ ]^{\text{a}} \ [. \ ]

e. get it  \[ g \ \ ]^{\text{a}} \ [. \ ]

f. get it  \[ g \ \ ]^{\text{a}} \ [. \ ]

g. that's what it was  \[ \text{\text{'s}} \ \ ]^{\text{a}} \ [. \ ]

h. what it is  \[ w \ b \ ]^{\text{a}} \ [. \ ]

i. what it is  \[ w \ b \ ]^{\text{a}} \ [. \ ]

j. just want it  \[ d \ i \ ]^{\text{a}} \ [. \ ]

k. would eat it  \[ w \ o \ d \ ]^{\text{a}} \ [. \ ]

l. you're at it  \[ j \ y \ ]^{\text{a}} \ [. \ ]

m. I hate it  \[ h \ e \ ]^{\text{a}} \ [. \ ]

n. I hate it  \[ h \ e \ ]^{\text{a}} \ [. \ ]

o. he bought it  \[ h \ i \ ]^{\text{a}} \ [. \ ]

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p. about that before  

q. at that (0.6)  

r. make it up  

s. I cook it  

t. soak it up  

u. (don't look) like it, no  

v. I like it  

w. don't like it  

x. take it out  

y. take it  

As with the examples in (36), the disyllabic portions under investigation have been tentatively delimited using a dotted line to facilitate reference. The following observations are made about these portions in (37):

(i) there is one instance of glottal closure.

(ii) the vocalic gesture preceding glottal closure has accompanying creaky phonation.

(iii) all portions have intersyllabically an oral structure of complete closure or close approximation, together with a vibrating or open glottis.

(iv) the first syllable of the disyllabic portion is never accompanied by creaky voice.
4.5 Phonology II

Some of the observations made about the examples in (36) and (37) are similar to those made about the portions in (31) and (32). The disyllabic portions all have creaky voice and in the majority of cases glottal closure. The distribution of glottal closure in the IT-pieces and non-IT-pieces is the same and this suggests that it is justifiable to retain the glottal piece as a suitable phonological abstraction. However, statements regarding the exponentcy of the glottal piece will need modification. Furthermore, V and C will need to be specified beyond the informal categories of vowel and consonant. Maintaining the glottal piece as a part of the statement, one of the main tasks of the analysis now is to provide an account for the many different consonantal articulations and accompanying phonation types which are found in both monosyllabic and disyllabic glottal pieces. The problem can be made clearer by extracting the consonantal alternations at the syllable final position from the records in (36) and (37) in the form of the list in (38).

(38) \[ \begin{array}{ccc}
\text{Disyllabic} & & \text{Monosyllabic} \\
\text{keep} & \hat{\phi} & \hat{\rho} \\
\text{opposite} & \hat{\zeta} & \\
\text{put} & \hat{\zeta} & \hat{\zeta} \\
\end{array} \]
get $r$
what $g$
want $g$
eat $d$
at $t^s$
hate $t^s$
bought $t^s$
heat $t^-$
make $c$
take $c$
soak $x$
cook $x$
like (Prep.) $g$
like (Verb) $c$

In (38) there are a number of different articulations in terms of state of the glottis, place and manner of articulation. In terms of place they can be divided into three groups: bilabial, alveolar and palatal/velar, the last two are perhaps better described with regard to the active articulator — apical and dorsal. Although such
a three way division accounts for place, the problems of the different states of the glottis and manner of articulation still remain. Two initial accounts could be given for these parametric differences. First, it might be argued that they represent examples of the range of variability which the speaker is prepared to produce at this particular point in utterance. The other possibility is that the production of a voiceless alveolar plosive as opposed to a voiced alveolar tap is part of the speaker being in a different style or register. I would argue, however, that either of these accounts should only be introduced when no other account for the phonetic observations can be found. I will show that an adequate account can be proposed in terms of a phonological statement interacting with a description of the lexical and grammatical categories to which the items belong. I shall begin by giving an account of the apical gestures as these are the most numerous examples in the corpus, and also because they provide the widest range of gestures in terms of manner of articulation and phonation type.

In (39), below, I have divided the disyllabic portions which have an intersyllabic apical gesture in terms of phonological vowel quantity of the first syllable. Here phonological quantity is an abstraction of features such as duration and quality observable at the phonetic level.
Glottal piece V - short disyllabic

a. opposite it s ə r ə?

b. put it ˈpʊ r ə?

c. get it ə r ə?

d. what it w ə r ə?

e. want it w ə n ə?

f. don't it ə ə n ə?

Glottal piece V - long disyllabic

g. about it ə b ə r ə?

h. eat it ɹ a ə?

i. at it ə ɹt ə?

j. hate it ɦ ə tə?

k. heat it ɦ ə tə?

l. bought it ə b ə tə?

From this first division of disyllabic glottal pieces into short and long vowels one pattern arises, i.e. all voiceless apical gestures are found where the vowel of the first syllable has been categorised as long - (39i-l). However, it is not the case that all the voiced apical
gestures occur only with short vowel syllables - (39g & h). The next step is to consider these items in terms of the syntactic categories to which they belong. In (40) the portions in (39) have been further divided into grammatical and lexical items.

(40)

<table>
<thead>
<tr>
<th>Grammatical glottal piece disyllabic</th>
<th>V-short</th>
<th>V-long</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) w ŭ ř ř̂̊̾̊̊̊?</td>
<td>what it</td>
<td>about it</td>
</tr>
<tr>
<td>(b) ʉ ŭ ř ř̂̊̾̊̊̊?</td>
<td>don't it</td>
<td>at it</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lexical glottal piece disyllabic</th>
<th>V-short</th>
<th>V-long</th>
</tr>
</thead>
<tbody>
<tr>
<td>(e) s ŕ ř ř̂̊̾̊̊̊?</td>
<td>opposite it</td>
<td>eat it</td>
</tr>
<tr>
<td>(f) ź ŕ ř ř̂̊̾̊̊̊?</td>
<td>put it</td>
<td>bought it</td>
</tr>
<tr>
<td>(g) Գ ŕ ř ř̂̊̾̊̊̊?</td>
<td>get it</td>
<td>hate it</td>
</tr>
<tr>
<td>(h) w ŭ ŕ ř̂̊̾̊̊̊?</td>
<td>want it</td>
<td>heat it</td>
</tr>
</tbody>
</table>

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Two principle observations can be made about the divisions made in (40). First, leaving aside the problematical status of the apical gestures in (40d) and (40i), the divisions now provide an account of the different intersyllabic gestures. Second, the introduction of divisions into lexical and grammatical categories makes the vowel quantity division in grammatical items no longer necessary. This observation illustrates well how the phonology operating in one system, i.e. the class of grammatical items can be different from that operating in the lexis.

A full statement incorporating portions with intersyllabic bilabial (B) and dorsal (D) gestures is presented in (41).
Generalised phonological representation:

<table>
<thead>
<tr>
<th>Lexis</th>
<th>[C Y(C)q əq]</th>
<th>[C Y(C)q əq]</th>
<th>[CV(C)q]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammar</td>
<td>[CV(C)q əq]</td>
<td>[CV(C)q]</td>
<td>[CV(C)q]</td>
</tr>
<tr>
<td>Lexis</td>
<td>[C Yq əq]</td>
<td>[C Yq əq]</td>
<td>[CVq]</td>
</tr>
<tr>
<td>put it</td>
<td>h i t ə?</td>
<td>h e i? ə  v</td>
<td></td>
</tr>
<tr>
<td>heat it</td>
<td>h e i? ə  v</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hate everything</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[C Ynq əq]</td>
<td>[C Ynq əq]</td>
<td>[CVnq]</td>
<td></td>
</tr>
<tr>
<td>want it</td>
<td>w o ə?</td>
<td>w o ə?</td>
<td></td>
</tr>
<tr>
<td>no example</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>want a</td>
<td>w o ə?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[C YBq əq]</td>
<td>[C YBq əq]</td>
<td>[CVBq]</td>
<td></td>
</tr>
<tr>
<td>keep it</td>
<td>k i φ ə?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>keep on</td>
<td>k i φ ə?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>no example</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[C YDq əq]</td>
<td>[C YDq əq]</td>
<td>[CVDq]</td>
<td></td>
</tr>
<tr>
<td>like it</td>
<td>i ə i ə ə?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>like her</td>
<td>i ə i ə ə  v</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grammar</td>
<td>[CVq əq]</td>
<td>[CVq]</td>
<td></td>
</tr>
<tr>
<td>what it</td>
<td>w o ə?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>what I</td>
<td>p w o ə? ə  v</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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The units set up at the phonological level represent the following abstractions:

(42)

[ ] - the glottal piece

q - (i) piece final: on-syllable creaky phonation, potential syllable final glottal closure and optional stricture of complete closure in the oral cavity where C is present.

(ii) piece non-final: on-syllable voice and stricture of complete closure or close approximation in the oral cavity, which is apico-alveolar when C is absent syllable finally.

n - lowered soft palate.

B - bilabiality.
D - dorsality.
- - long quantity.
* - short quantity.
 ø - syllabiccty.
V - vocalicity.
C - consonantality.

The phonological statement presented in (41) and (42) has been extended substantially from that presented in (33) and (34). From examples (36d & k, p. 132) it has been necessary to restate the phonetic correlates of q in piece final position in terms of a glottal setting which could potentially lead to complete glottal closure. Note here that the conventional way of treating creaky voice is in terms of a coarticulatory effect preceding glottal closure - this approach would meet with problems in those examples where glottal closure is absent.

One important implication of the statement here is that the actual state of the glottis observable intersyl-
labically in disyllabic glottal pieces is not directly derivable from the phonology alone, but is an interaction of phonological quantity (stated as Ź and Ź) and other information about an item's membership at the grammatical and lexical levels of analysis. The attraction of this proposal is that the phonetic shape of a particular disyllabic glottal piece can be a pointer to a syllable's function as part of the grammar or lexis. A good example of this is (40d, p. 140), 'you're at it', where the inter-
syllabic open state of the glottis may suggest that 'at' is functioning, not as a grammatical element, but as part of the lexis. The problematical status of the voiced apical gesture in (40i, p. 140), 'eat it', can be resolved in a similar way. Although 'eat' has been categorised as long quantity and lexical, the intersyllabic voicing may indicate the frequent use of such an item.

There is an alternative way of looking at the indeterminate phonation type observable intersyllabically in disyllabic glottal pieces in more general terms. The phonation type which is part of the exponency of q piece-finally is always predictable: creaky phonation and potential glottal closure. It is here (piece-finally) that it is difficult to predict (for B and D) whether there will be an oral stricture of complete closure. When q is non-final in the piece, the problem of indeterminacy is reversed. Here there is always an oral stricture of complete closure or close approximation, and it is the state of the glottis accompanying the oral stricture which it is difficult to predict. These differences can be illustrated graphically as follows:

\[(43)\]

\[
\begin{array}{c|c}
[sq] & [eq] \text{ or } [sq] \\
\downarrow & \\
\text{articulatory gesture} & \text{phonatory gesture}
\end{array}
\]
4.6 Other glottal pieces

Up to this point the analysis of disyllabic glottal pieces has been concerned with one particular final syllable, the pronominal item 'it'. In this section I will show that there is at least one other syllable which displays similar phonetic and phonological features as 'it'. This will also highlight the importance of categorising certain vocalic portions as ə as against V at the phonological level, which goes beyond the actual phonetic quality of a vowel as [ə]. I assumed that syllables which might behave in a similar way to 'it' would have to have the following properties:

(i) no syllable initial consonantal gesture.
(ii) final glottal closure together with creaky voice over the syllable.
(iii) membership of the closed class of grammatical elements e.g. prepositions, pronouns, etc.

There were three items found to have these properties from the grammatical class prepositions: 'at', 'up' and 'out'. The portions given in (44) contain syllables which in other prevocalic environments would have final glottal closure, followed by one of the three prepositions.
(44)

a. finish it up
b. tidied it up
c. held it up
d. just get up to
e. Janet up
f. leave that out
g. have it out
h. sit out
i. get a lot out
j. a bit at (0.6)
k. look at that

From the records in (44) it should be clear that the behaviour of 'up' and 'out' differs considerably from that of 'at', which in turn behaves the same as 'it'. The disyllabic portions containing 'up' and 'out' have creaky phonation throughout. These portions can also have intersyllabic and syllable final glottal closure, but need not have both, e.g. (44d, e, g).

Examples (44j, k) have creaky phonation accompanying the final syllable only and an intersyllabic oral approximation. The problem that arises here is at what level the
different phonetic observations should be resolved. At the grammatical level one is dealing with items which are all prepositions, some interacting with verbs to form phrasal verbs. Although there is not a solution at the grammatical level, there is one at the phonological level: the syllabic portions of 'up' and 'out' are abstracted as \( V \) and that of 'at' as \( @ \). The advantage of this solution is that the portions containing 'up' and 'out' are treated phonologically as examples of two adjacent glottal pieces, whereas those containing 'at' are examples of disyllabic glottal pieces. This difference is illustrated in (45).

\[
\begin{align*}
(45) & [(C)Vq] [Vq] \quad (\text{examples 44a-i}) \\
& [CVq \, @q] \quad (\text{examples 44j & k})
\end{align*}
\]

Finally in this section I present one example which illustrates well the potential domain of the phenomenon which has been described here:

\[
(46) \quad \text{look at it} \quad \begin{array}{c} \text{\textcolor{red}{\text{\#}} g \ \textcolor{red}{\text{\#}} \ \textcolor{red}{\text{\#}} \ \textcolor{red}{\text{\#}} \ \textcolor{red}{\text{\#}} \ ?} \\
\end{array}
\]

\begin{align*}
\text{Phonology} & [C \, \check{V}Dq \, @q \, @q]
\end{align*}

This example is the only one of its kind in the corpus, but it does show how the glottal piece can be more than two syllables in length (in this case three). As one can see, the phonological formula provided in (46) together with its interpretation in (42) adequately accounts for
the phonetics one can observe in this example of a tri-syllabic piece. Indeed, English syntax potentially admits a quadrasyllabic glottal piece in a sentence such as I didn't look at it at work. Although I have no such example in my corpus, I have been able to elicit read material from one speaker of another variety of English who produced the example sentence in exactly the way my analysis would have predicted, i.e. three intervocalic oral gestures, and creaky voice and glottal closure occurring only over the final pronominal it.

4.7 Firthian prosodic aspects of the analysis

As in the previous chapter, the phonological statement I have arrived at here is essentially Firthian prosodic. In particular it has much in common with Eileen Whitley's (henceforth EMW) prosodic phonology of English. In making reference to her work I will be using a series of lecture notes made by some of her students\footnote{E.J.A. Henderson, N. Waterson, S.J. Harlow and J. Kelly.} over the course of a number of years, together with a paper which she presented at the Second York Symposium on Non-linear Phonology in 1986. Although EMW worked on the phonology of English for a great number of years she never published any of it, and apart from the work mentioned above, a small part of her phonological treatment of English is to
be found in a reworking of certain aspects of syllable structure in Albrow (1975, 13-19).

One component which my analysis of English unavoidably shares with that of EMW is Firth's notion of 'context of situation'. This notion, which he attributes to Malinowski (1923) and ultimately to Wegener (1885), is perhaps most succinctly put in the following:

'My view was, and still is, that 'context of situation' is best used as a suitable schematic construct to apply to language events, and that it is a group of related categories at a different level from grammatical categories but rather of the same abstract nature. A context of situation for linguistic work brings into relation the following categories:

A. The relevant features of participants: persons, personalities.
   (i) The verbal action of the participants.
   (ii) The non-verbal action of the participants.
B. The relevant objects.
C. The effect of the verbal action.'

(Firth 1957, 182)

This placement of utterance in context was however not restricted to the 'social' level, but was continued at the grammatical level. EMW's phonology of English based on observations made at the phonetic level strongly

\(^{47}\)EMW's use of 'phonic' and 'phonetic' is slightly different from my own. For her 'phonic' was what I refer to as 'phonetic', and her 'phonetic' involved a further degree of abstraction which systematised some of the patterns observed at her 'phonic' level. EMW illustrates this difference using the bilabial plosives at the beginning of items such as 'pit', 'pet', 'pat', 'pot', 'put' and 'putt'. The observation that all the bilabial plosives are different with respect to the tongue and the lips belonged to the phonic level. It was at the phonetic level where she could reflect their 'sameness', e.g.
reflected this embedding of utterance in its grammatical and possible\textsuperscript{48} social contexts. So, rather than talking about a set of possible vocalic alternations that could turn up in a list of words drawn from any and all syntactic categories, as is found in phonemic analyses of English, e.g. Jones (1956), Gimson (1980), which are devoid of any grammatical and social context, EMW analysed those patterns in the articulatory and phonatory activity which could be observed in analogous contexts. EMW's analysis of certain vocalic alternations and other features extending throughout the syllable, such as lip-rounding, was first and foremost an analysis of alternations which take place in minimally differing contexts. This contextualisation took the form of lists such as the following:

\begin{enumerate}
\item What do they do?
\item Where did they go?
\item What shall we thaw?.
\item When do I bow?
\item What can you see?
\item What did he say?
\item What did you buy?
\item What do they enjoy?
\item What did they tar?
\item Why did it whirr?
\item What did you hear?
\item Why did you stare?
\item Why won't it pour?
\item Where will they tour?
\item What did it hit?
\item Where was it set?
\item When did he bat?
\item Why did it rot?
\item Where was it put?
\item What did they cut?
\end{enumerate}

\textsuperscript{48}EMW's data was based mainly on her intuitions of her own English, together with observations she had made in other varieties, e.g. American English.

\footnotetext{48}{EMW's data was based mainly on her intuitions of her own English, together with observations she had made in other varieties, e.g. American English.}
As one can see from the above, 'minimalness' for EMW is much stronger than, and at the same time different from, that demanded by other phonological frameworks. All the above represent examples of verbs in final position in WH-question frames, and EMW required them all to be pronounced with the same pitch and prominence patterns. This type of data presentation enabled EMW to keep the same, and hence eliminate, as many factors as possible. This allowed her to concentrate on the articulatory and phonatory patterns attendant upon the final syllable of each expression. Demanding this degree of minimal difference is, of course, made at the expense of the minimal differences found in the bare word lists of, for instance, phonemic phonology where care is taken to create similar phonetic contexts in the form of the same initial and final consonantal patterns when looking at vocalic alternations.

Context of situation and grammatical contextualisation is an integral part of the analysis contained in all three of the empirical chapters of this study. The portions of utterance represented in the form of impressionistic records are all extracted from conversational interaction, and I have shown that the patterns I have observed in these portions can only be accounted for adequately with reference both to non-linguistic factors, such as the interactional activity of pausing, and to linguistic abstractions at levels other than the phonological, i.e. syntactic categories and structures.
My analysis differs from that of EMW in that the very nature of my data does not allow me to eliminate as many factors at the outset. So, although in the previous chapter I was able to restrict my analysis to prepositional phrases headed by three prepositions contained within the same rhythmic structures, it was not possible to keep the interactional features, such as the presence or absence of pauses the same.

A characteristic of the analysis presented in this chapter in particular which is at odds with EMW's is that rather than looking at patterns in the same syntactic structures containing IT and AT, I have looked at the articulatory and phonatory patterns in any structures containing IT and AT and invoked the necessary structures as required, e.g. the proposal of splitting items up into groups on the basis of their membership to grammatical or lexical classes. This approach is more in line with Hill (1966):

'...Distinct phonological systems may be set up for any subdivision of the word, or any set of words (of any size from one upwards), if by this means the phonological form of the language is more clearly revealed than in an all-inclusive description. ...Such phonological sets of words can often be attributed to a grammatical or lexical category, and a description of them may be regarded as the phonology of that category; but it is only in cases of this kind that grammar and lexis should be regarded as relevant to phonology.'

(Hill 1966, 222)
A further similarity of my analysis with that of EMW is in the proposal of various phonological entities and the symbolisation used to represent them. In many cases this is simply because I see parallels between the types of patterns I have observed and the phonetic correlates which EMW attributes to her phonological items. So, for instance, I have found it convenient to propose the items B and D to represent bilabiality and dorsality respectively, and this is directly parallel to EMW's proposal of labial, apical and dorsal elements to account for certain punctual features, such as place of articulation in terms of the active rather than the passive articulator. I suspect that EMW also did this to provide a more elegant account of the differences in the passive place of articulation which one can observe finally in items such as 'make' and 'look'.

The phonological item q which I have proposed to account for a whole range of articulatory and phonatory activity has most in common with EMW's H. This item is one term in a two-term system H/H which has implications for utterance extending over the final portion of certain syllables. Part of the phonological statement which EMW provides to account for some of the differences to be found in uttering the sentences:

Where did they wait?
Where did they wade?

would be as follows:
(48)

\[ T^H \]

\[ T^N \]

T - apicality with closure.

H - final position: absence of voicing with breathy release or checked with a glottal stop; quick onset of closure; shortening of vocalic portion.

N - final position: not strong breath force; possibility of voicing; maintaining of voice of syllable as long as possible; late onset of closure; lengthening of vocalic portion.

Such phonological units as these share some of the characteristics of the various types of articulatory, acoustic and auditory distinctive features which have been proposed since they were first presented in Jakobson et al. (1951). They have in common that certain portions at the phonetic level are seen as being composed of the phonetic correlates of number of units at the phonological level. However, the phonematic and prosodic units\(^ {49} \) of EMW's analysis are different in at least two important

\(^{49}\)I have avoided the use of the terms 'phonematic' and 'prosodic' units in my own analysis as I see this distinction as being a relatively arbitrary one. It seems to me that the only difference between a phonematic unit and a prosody is one of the domain of the phonetic correlates of a unit, i.e. those units whose correlates have a relatively short domain being phonematic, those with a longer domain being prosodic.
respects.

First, although the alveolar plosive at the end of 'wait' can be seen as the combination of the correlates of T and H, these items crucially have implications for utterance over different temporal domains at the phonetic level. The item T has relatively short domain implications (apicality and plosion); H, on the other hand, has correlates which overlap with those of T, but also go beyond, having implications for the length of the vocalic stricture.

Secondly, phonematic and prosodic units have correlates which are rarely assignable to one phonetic parameter. The units H and Ẹ, for instance, have implications for the state of glottis, but are also responsible for the duration of the vocalic portion and the length of closure during the consonantal portion.

In summary, as in Chapter Three, I consider the phonological statement I have proposed here to be Firthian prosodic, differing in two respects:

(a) no distinction is made between phonematic units and prosodies.

(b) the data on which my phonology is based is taken from naturally occurring talk.

4.8 Other analyses

In this section I examine treatments of the glottal
piece by other analysts, but to begin with in 4.8.1 I will carry out what I consider to be a conventional process phonological analysis on my data. My reasons for doing this are as follows. The main aim of this study is to show how one can arrive at a phonological statement from conversational material alone, and all the empirical chapters of this study are designed to show that this is a practicable exercise. However, the treatment of the data in this chapter also displays more clearly than any other how different the phonological statement can be as a result of the approach which I am adopting. In 4.8.2 I then examine other analyses of the glottal piece, and will show how, in the case of one analyst, the identification of the phenomenon I have described does not stop the analyst missing examples of the glottal piece because his approach to the data is primarily that which I will illustrate in 4.8.1.

4.8.1 A process phonological account

In Chapter One I looked at the way in which analysts have accounted for the phonetics of non-citation form utterance in terms of rules. These rules take as their input a string of phonetic segments and change one of the segments in that string if it is in the context of one or more other segments. For the purposes of the illustration here I leave aside my criticisms of these rules (see
section 1.2.2). Many of the phonatory and articulatory complexes represented in my impressionistic records could have been accounted for using derivational rules. In (49) I present a number of such rules, together with cases from my own material which I consider constitute examples of the application of such rules. I also adopt the practice of having knowledge of the citation form phonetics.

(49) Nasalisation

\[ V \rightarrow \{ +\text{nas}\}/ \quad \text{N } \left\{ \begin{array}{c} \# \\ \text{C} \end{array} \right\} \]

examples: (31a-c, e-f), (36f)

Nasal deletion

\[ N \rightarrow \emptyset/ \left[ \begin{array}{l} V \\ \text{+nas} \end{array} \right]/ \quad \]

examples: (31a), (36f)

Lenition:

(a) voicing  /p, t, k/ \rightarrow \{ +\text{voice}\}/V__V

examples: (32e-g), (37b-i, k, u)

(b) fricativisation  /p, t, k/ \rightarrow \{ +\text{cat} \}/V__V

examples: (37r-t, v-y)

(c) deletion  /p, t, k/ \rightarrow \emptyset/ \quad \#

examples: (36b-i, k, n)

Glottal reinforcement  /p, t, k/ \rightarrow ?C/__#

examples: (36a, j, l, m, o)
As I see it, the categorisation of bits of phonetics carried out in this fashion constitutes an acceptable phonological analysis of at least some of this data. However, using such rules to account for certain complexes observed in my data is seriously lacking in a number of respects. First, the rules themselves manage to drive apart articulatory and phonatory complexes which I showed to be related. Secondly, the rules only have very limited implication for utterance - the segment. This limited domain of operation successfully hides the long-domain phenomenon which I have described. Finally, a number of complexes which were included in my analysis would have no place in the type of analysis outlined here since they would be treated as the phonetics of the citation form and therefore 'normal', examples of this being the voiceless alveolar plosives in (371-q).

4.8.2 Other analyses of the glottal piece

There are at least two other analysts who have noticed and attempted to describe the phenomenon I have analysed here. Trudgill (1974) made similar observations in data from another accent of East Anglian English, that of Norwich. He describes the glottal piece in terms of a restriction 'that a glottal stop cannot occur both before and after /ə/ or unstressed /ɪ/' (1974,175). This
restriction is stated in terms of the generative rule given in (50).

\[ (50) \]

\[
\begin{align*}
/t/ & \Rightarrow x \\
\langle [t] \ [\tilde{t}] \rangle & \begin{cases} 
/\ddash/a/ \\
- & /\ddash/ \\
/\ddash/ & /\ddash/ \\
/\ddash/ & /\ddash/ \\
/\ddash/ & /\ddash/ \\
\langle [t] \ [\tilde{t}] \ [\ddash] \rangle &
\end{cases}
\end{align*}
\]

(Trudgill 1974, 175)

Essentially this rule says that the phonetic realisation of /t/ will depend upon, both sociolinguistic factors such as age, sex and class and the phonological restriction that a glottal stop cannot occur on both sides of certain vocalic elements. I argue that there is a problem here for the phonological variable. I shall take one of Trudgill's examples:

\[ (51) \]

'put it' \[ p^b \hat{o} t' a? \] (Trudgill 1974, 174)

The portion [t'] would be partly predicted by the rule in (50). In the sociolinguistic analysis final syllabic [t'] would be assigned a particular score, and presumably the same score if the speaker produced \[ p^b \hat{o} t' a \] 'put a'. However, the two voiceless alveolar plosives
could represent phonetic correlates of different systems, one being the phonetic correlate of \( q \) in non-final position of the glottal piece, the other being the phonetic correlate of \( q \) in final position of a monosyllabic piece in a particular style. Furthermore, Trudgill's analysis does not have to accommodate examples like my own where a number of different articulations can be found inter-syllabically. Presumably, the occurrence of intersyllabic nasals, e.g (31e-g, p. 124) would have to be treated using a rule to delete a stop. This would be necessary since the phonological variable \( t \) in Trudgill's study does not have zero as one of its variants.

Lodge (1984) presents naturally occurring data from a number of accents of English. He, too, makes a similar observation to that made by Trudgill:

"There is a constraint on the occurrence of [?] for both informants: a sequence \( ?\ddot{e} \), where \( \ddot{e} \) = unstressed vowel, either [\( \ddot{a} \)] or \( [\ddot{e}] \), is ruled out, except in absolute initial sequences with an added glottal onset, as in \( [[g]s] \) (27). Thus we find [énte?] 'isn't it?' (27), but not *[én?e?].'"

(Lodge 1984, 42)

Having made this observation, however, Lodge does not recognise it at other places in his material, and other examples, which I would argue to be cases of disyllabic glottal pieces, undergo precisely the treatment which I described in 4.8.1. Here are some examples:
'The other frequent type of lenition is intervocalic voicing of /t/ [ti?] *it it* (Lodge 1984, 58)

'The most common lenition applies to voiceless stops, which are either realised as lenes or completely voiced, usually in intervocalic position, but also elsewhere, e.g.

[tɒg id æoʊt] *took it out* (Lodge 1984, 102)

'Lenition. The process is not particularly widespread in E.'s speech, though there are a number of examples of stop → fricative, as in:

[tʃʌxə?] *chuck it*

... there is one instance of a flap [pɔ̃ɡə?] 'put it.' (Lodge 1984, 116)

The most important difference between my analysis and that of Lodge is that 'lenition' and 'flapping' are not phonological categories for me, but rather would be initially part of my set of observations and ultimately phonetic correlates of more abstract phonological categories I have proposed. Not only has Lodge taken certain expectations50 to the data he is analysing, but also a range of labels which do no more than attach a name to a

50cf. section 2.7.
difference between one set of phonetics and another. This set of labels has the serious consequence of excluding the possibility of 'seeing' any other account of the material.

4.9 Discussion

As with the analysis of the prepositional phrase presented in Chapter Three, the phonological statement constructed in the initial sections of this chapter has a number of important implications. It again shows that a phonological description of naturally occurring talk can be made without reference to descriptions of other linguistic activities performed by the informant. It also shows that a statement which adequately accounts for the phonetic observations made must make abstractions at a number of levels of analysis (phonological, grammatical and lexical). I would also argue that the phenomenon described here, and the statement provided to account for it could not have been arrived at by intuition alone. The function of my own intuitions in this analysis was to isolate portions in the corpus once the phenomenon had been identified.

The glottal piece as I have stated it in the phonology has been made sufficiently abstract for it to be applied to data from other varieties of English. This claim is supported by observations I have made in the talk.
of a speaker of another variety of English (Manchester). Two things were striking about these observations. First, the patterns of articulatory and phonatory activity in the talk of this speaker were very similar to those in the talk of the subject of this study. Secondly, the observations were not made from naturally occurring data, but from data elicited from reading prepared sentences: *I didn't look there, I didn't look at that, I didn't look at it there, I didn't look at it at work.* In other varieties one might well find phonetic differences between syllables in pre-IT/AT and pre-vocalic environments where the differences are unlike those I have observed in my own data. Here the phonological units and phrase I have proposed might still represent a suitable abstraction to account for the patterns observed, but the details of the exponency statements would be have to be changed to account for different phonetic exponents of the phonological units involved.

To return to the comments I made about the variety of phonological and phonetic categorisations of the glottal stop in the introduction, it should now be clear that I consider this to be the wrong end to start from. The glottal stop in the analysis which I have proposed is only one part of the phonetic exponency of a phonological unit at a particular place in the structure of the glottal piece.

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51 The same speaker referred to at the end of section 4.6.
Finally, I showed that the approach I have adopted and the phonology I am implementing arrive at a completely different set of results from an approach (illustrated in 4.8) which brings a set of descriptive labels (i.e. phonological processes/rules) to the material and casts them as a phonological analysis.