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GENERATION OF INTONATION CONTOURS FROM A SYNTACTICALLY SPECIFIED INPUT

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1. That the title of this paper refers to "generation" as opposed to "synthesis" of intonation contours reflects the fact that I shall be discussing intonation from a somewhat abstract rather than a concrete point of view, that is with reference to grammatical considerations rather than in strictly practical terms. Nevertheless, since the grammar I am talking about is a generative grammar, therefore one which seeks to generate intonation contours in a precise and explicit manner by means of algorithms operating on clearly defined input structures, I am hopeful that the processes and procedures I shall describe will be of interest to those concerned with synthesis-by-rule of intonation.

    There are two problems I shall discuss. The first is the question of how intonation contours are most suitably represented in the grammar, and of what types of formal device are required to generate representations that correspond to observed intonation contours. Secondly, I shall discuss the relation between intonation and syntax, with a view to determining to what extent and in what ways the syntactic structure of an utterance determines its intonation pattern. The examples I give will be taken from French, simply because I am more familiar with French intonation than with English. There is no reason to suppose, however, that the types of phenomena I shall deal with are peculiar to French: from what I know of it, English intonation is likely to prove at least as complex, and is in some ways clearly far more complex.

2.1 How are intonation contours to be represented? Ultimately, we must generate structures that correspond fairly closely to physical and perceptual parameters, if for no other reason than to ensure that our theory attains a high degree of testability. This seems to me to immediately rule out the type of representation traditionally used in work on intonation in the UK, namely systems of "tonetic stress marks". Without wishing to deny that such systems can if necessary be related to more concrete phenomena in some unambiguous way, I would argue that they are in themselves too abstract, too far removed from what we can observe to constitute an adequate representation of intonation contours at the phonetic level. We can also rule out a type of representation often used in the United States, the "pitch-levels" system of representation. Although this can be taken in a fairly natural way as a representation of pitch contours in terms of step-functions, it is immediately apparent that pitch (or fundamental frequency) contours are not adequately represented by step-functions, and the problem of providing a more refined specification has never, to my knowledge, been tackled, much less solved. Similar remarks hold for the recently developed "autosegmental" theory of tone and intonation, which seems to me to be little more than an even cruder version of the earlier pitch-levels theory involving only three levels instead of the original four or seven.

Two observations seem to me to be both obvious and crucial. First, pitch/fundamental frequency contours vary in a quasi-continuous fashion with time, rather than taking the form of a series of steps. Second, intonation is quite rightly referred to as a suprasegmental phenomenon, in that intonation patterns belong to utterances (or part-utterances) as wholes, rather than to particular segments, or indeed to particular syllables. (One might say that "suprasyllabic" would be an even better term than "suprasegmental"). Although intonation contours are frequently disrupted physically by the presence of obstruents and voiceless sounds in the segmental chain of the utterance, it seems clear that utterances differing greatly in terms of their segmental make-up can nevertheless bear in some sense the "same" intonation patterns. Thus at an abstract level, intonation patterns should be seen as continuous, rather than broken, variations of pitch/fundamental frequency.

In the light of these observations, it is natural to see intonation patterns as being a continuous function from time onto pitch/fundamental frequency (ignoring any slight lack of correspondence between pitch and fundamental frequency, as being irrelevant for our present purposes). Call this function f. The whole problem of generating intonation contours then becomes simply that of specifying f. I say "simply", although it is clear that the problem is really not so simple at all; if it were, we would have much better grammars of intonation than exist at present, and synthesis-by-rule of intonation would also be much further advanced. The approach I shall adopt involves not specifying the function f directly, but rather defining its first time derivative, f', a function from time onto rate of change of pitch/fundamental frequency. I am thus in effect viewing intonation not so much as variations of pitch/F_0 directly, but rather as a series of ascents, descents and level sequences. It is this innovation which, I shall claim, makes possible a far simpler and more insightful treatment of intonation, and thus opens the way to an adequate and comprehensive grammar of intonation, hence also, ultimately, to improved methods for intonation-by-rule. Notice that recovery of the function f from its derivative f' is simply a matter of integration.

Not surprisingly, a number of simplifications have had to be made for the sake of progress, the most important of these being that the grammar so far developed recognises only four terms in the field of scalar values for f', namely -1,0,1,2. That is, the system generates only one type of fall, or rather one degree of descent (the value of f' being -1), two degrees of ascent (values of f' being 1 or 2), and level sequences (the value of f' being 0). Thus an intonation contour such as [1a] (itself an abstraction, of course) will be represented in the form [1b].

[1] a.

f

t

b. +2

+1

f' 0

−1

t
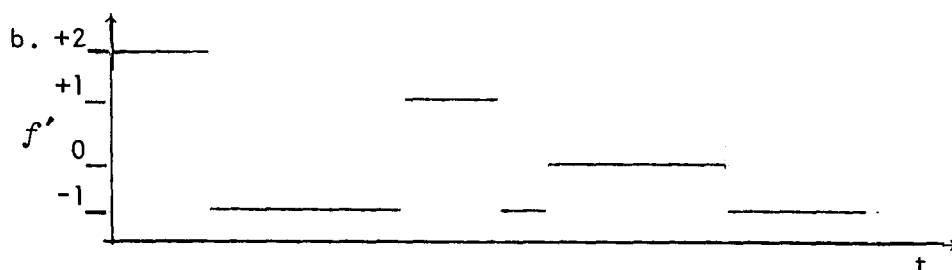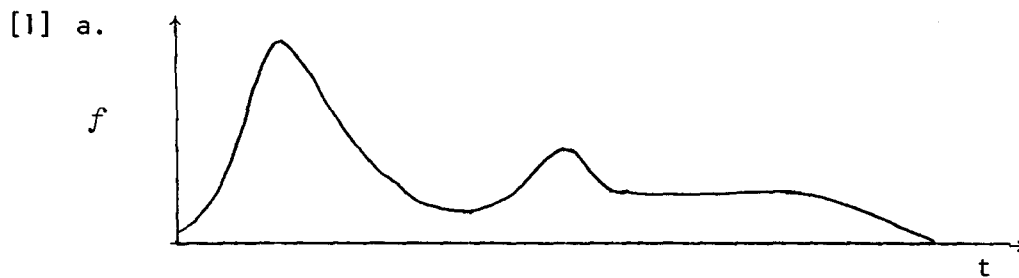
Corresponding to the functions f and f', the grammar makes use of
two features [f] and [f'], with [f] a scalar feature having non-
negative integers as coefficients, and [f'] a scalar feature with
coefficients -1, 0, 1, 2. In fact, a further degree of abstraction
is called for, involving the decomposition of [f'] into two other
features [Rise] and [Fall]. [Rise] is a scalar feature with
coefficients 0, 1, 2, and [Fall] a binary feature with coefficients
+, -. In what follows, we shall not be concerned with patterns
involving [2f'] or [2 Rise] (these being rather rare), so for
purposes of simplification I shall treat [Rise] as binary. We then
have the feature-specification [+Rise, -Fall] to represent ascents.
[-Rise, +Fall] for descents, and [-Rise, -Fall] for level sequences.
[+Rise, +Fall] is excluded by convention.

2.2 Having devised a suitable means of representing intonation contours
in the grammar, we are getting into a position where we can begin to
generate some of the patterns actually found to occur. Before we do
this, however, a couple of preliminary points need to be made.

The first point concerns the domain of the rules to be presented
below. Not surprisingly, it is hardly practical to generate the
intonation patterns of entire utterances all at one go. In fact, as
is well known, in many languages (including English, French, German,
Swahili), utterances consist of a number of units variously known
as tone groups, tone units, or phonological phrases (I shall use the
last of these three terms), and it is natural to take these as the
domain of at least some of the rules for generating intonation
patterns. But even to generate patterns for entire phonological
phrases would be an extremely difficult task since the number of
different patterns probably runs to several hundred in French, maybe
considerably more in English. Moreover, we find that phonological

phrases typically consist of a number of "sub-units", whose intonation patterns recur in recognisable form from one phonological phrase to another. It would therefore seem sensible for the grammar to operate in terms of these sub-units, and to provide the means for stringing them together to form complete phonological phrases. It should be noted, however, that the size of the sub-units is variable, so that they are not a well-defined construct, and do not appear as a distinct structural unit in the grammar alongside such units as Sentence, Phonological Phrase, and so on.

Second, we need to devise some means of matching up the intonation contour of an utterance with its segmental structure. To see how this might be achieved, let us consider an example:

[2]

Mais les classes en question ne sont pas celles ...
(But the classes in question are not the ones ...)

The contour [f] marks both the fundamental frequency (continuous line) and an auditory representation (broken lines). It would clearly be an oversimplification to regard this auditory representation as the pitch contour of the utterance (it is really more of a transcription than a representation of anything at the phonetic level), and the vertical distances between the horizontal lines have been adjusted to provide a match with the F_0 contour, rather than to give a precise indication of the size of pitch differences. Nevertheless, the auditory representation is perhaps not totally without significance, since it is frequently the case that F_0 movements of considerable magnitude, as found, for instance, over the syllables /sã/, /pɑ/, fail to produce the perceptual impression of a moving tone, even in a trained phonetician, and it is not unreasonable to suppose that this corresponds to a real perceptual difference between syllables such as /sã/ and /pɑ/ on the one hand, with perceptually static tones, and syllables such as /sɛl/ on the other, with perceptually moving tones. That being the case, it is natural to locate the discontinuities in the [f'] pattern as being coincident with particular syllables of the utterance, thus obtaining representations such as [3a] in terms of [f'] and [3b] in terms of [Rise] ([R]) and [Fall] ([F]).

[3]

```
       [mais] [les] [cla-] [-sses en] [que-]  [-stion]    [ne]  [sont]  [pas] [celles]
(a) |     1f'     |  -1f'  |   1f'   |0f'|    |  1f'  | -1f' |  1f'   |
                                                                
(b) |    +R      |   -R   |   +R    |-R |    |  +R   |  -R  |  +R    |
         -F           +F       -F     -F         -F     +F      +F
```

There remains the question of the syllables *-stion* and *celles* in the example. These, being the last accented syllables in their respective phonological phrases, are referred to as "nuclei". Unlike most other syllables, nuclei frequently carry perceptually moving tones (*celles*, for instance, has a rising tone), and it seems reasonable to express this fact formally by assuming that nuclear syllables may correspond to more than one discontinuity in the [f'] pattern. Thus a high rising tone can be represented as in [4a(i)], a low rising tone as in [4a(ii)], falling tones as in [4b], static tones as in [4c], falling-rising tones as in [4d], and so on. The square brackets mark syllables. In all these illustrations, the [f] pattern takes the form of the sort of auditory transcription used in [2]; I shall continue to give examples in this form for reasons of convenience.

[4]

(i)

a.   [f]

[   ][   ]
| +R | +R |
| -F | -F |

(ii)

a.   [f]

[   ][   ]
| -R | +R |
| +F | -F |

b.   [f]

[   ][   ]
| +R | -R |
| -F | +F |

b.   [f]

[   ][   ]
| -R | -R |
| +F | +F |

c.   [f]

[   ][   ]
| +R | -R |
| -F | -F |

c.   [f]

[   ][   ]
| -R | -R |
| +F | -F |

d.   [f]

[   ][   ]
| +R | +R | -R |
| -F | -F | +F |

d.   [f]

[   ][   ]
| -R | +R | -R |
| +F | -F | +F |

Finally, we can simplify sequences of the form

$$\begin{array}{c|cc|} [\quad][\quad][\quad] \\ \mid \alpha R \mid \alpha R \mid \\ \mid \beta F \mid \beta F \mid \end{array}$$

to

$$\begin{array}{c|c|} [\quad][\quad][\quad] \\ \mid \quad \alpha R \quad \mid \\ \mid \quad \beta F \quad \mid \end{array}$$

where α, β are variables over +, -.

2.3   I shall now proceed to show how given the form of representation
just presented, it is possible to generate a rather wide range of
intonation patterns by means of a fairly simple set of rules.
Two types of rule will be discussed. First, rules that assign
intonation contours to utterances previously unspecified intona-
tionally; second, rules that effect various transformations of
intonation contours.

In devising rules to assign intonation contours to hitherto
unspecified strings of syllables, I shall make two assumptions.
First, that utterances have already been divided up into phonological
phrases; second, that the input to the rules contains a specifica-
tion of which syllables are accented, and which unaccented. The
reason for the first of these assumptions has been stated above.
Formally, the assumption is reflected in the fact that all the rules
will apply to structures of the form

$$\mid W \ldots X \mid$$

where | marks a phonological phrase boundary, and W,X are variables
over possibly null strings of syllables. The reason for the second
assumption is quite simply that one major function of intonation
patterns within phonological phrases seems to be to provide cues
for the identification of accents, so that the accentual structure
of a phrase constitutes as it were the framework on which the
intonation pattern is built. Formally, the assumption is that
accented syllables are specified [+ Accent] ([+A]), and unaccented
syllables [- Accent] ([-A]).

As a first, simple example, let us consider nuclear tones. French
intonation employs a fairly simple system, in which tones may be
rising, falling, or static, and begin on a high level, a low level,
or the same level, relative to the preceding syllable. Representa-
tions of six of the nine possible types have already been given in
[4]. The tones in question are generally carried by a single
syllable (the nucleus), but are frequently found spread over a
number of syllables, in cases where the nucleus is for some reason
not the final syllable in the phonological phrase. A sequence of
syllables after the nucleus is referred to as a "tail". In such
cases, the nucleus itself may be perceived as having a static tone,
even though the tone on the nucleus + tail as a whole may be rising
or falling. The sort of rule we need to generate such patterns is
[5].

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[5] $| W \text{ [-A] [+A] [-A]}_o |$

$$\left| \begin{matrix} \alpha R \\ \beta F \end{matrix} \right. \left| \begin{matrix} \gamma R \\ \delta F \end{matrix} \right| \left. \begin{matrix} \gamma R \\ \delta F \end{matrix} \right|$$ $\rightarrow$

where $\alpha,\beta,\gamma,\delta$ are variables over +,-, and the symbol [-A]_o stands for a sequence of zero or more unaccented syllables. In the case where no unaccented syllables follow the nucleus, the second [γR, δF] part of the output is inoperative. Notice that the nucleus is identified as the last [+Accent] syllable in the phrase.

The corresponding rule for English would, of course, need to be much more complicated, owing to the fact that English has "complex" nuclear tones (falling-rising, rising-falling, rising-falling-rising, etc). Not only does this mean that nuclear syllables must be permitted to contain three or more discontinuities in the [f'] pattern, but there is also the problem of where the discontinuities should occur in the case of nuclei followed by tails. The generation of complex tones in itself presents little difficulty, an output specification of the form [6] being all that is required. (Parentheses mark optional elements).

[6] $$\left| \begin{matrix} \alpha R \\ \beta F \end{matrix} \right. \left| \begin{matrix} \gamma R \\ \delta F \end{matrix} \right| \left(\left| \begin{matrix} -\gamma R \\ -\delta F \end{matrix} \right| \left(\left| \begin{matrix} \gamma R \\ \delta F \end{matrix} \right| \right) \right)$$

(Notice that if $\gamma = \delta$, then it is necessarily the case that $\gamma=\delta=-$, since [+R, +F] specifications are excluded. Furthermore, if $\gamma=\delta=-$, then $-\gamma=-\delta=+$, so that the optional elements in the output may not be taken if the nuclear tone is static; this is, of course, what is required). The other problem, that of the location of the discontinuities in tails, is one that I shall not deal with here.

Now let us turn to the patterns found on the sequences of syllables preceding the nucleus, which I shall refer to as the "body" of the phonological phrase. As mentioned earlier, it is convenient to simplify the problem by considering bodies to consist of a sequence of sub-units, each with its own intonation contour. The sub-units we shall be dealing with consist, for the most part, of strings of the form

[-A] ... [-A] [+A] [-A] ... [-A]

that is, an accented syllable preceded and followed by sequences of unaccented syllables.

One of the most commonly found patterns (in French) is that illustrated in [7a], where accented syllables are marked ⌐. (As before, the [f] pattern is represented by an auditory transcription; in addition approximate F_o values are given for each syllable).

[7a]

âgés d'au moins vingt-et-un ans

[f]

(FHF)

0 —

[f']

F₀   135   130   ?   165   - 90-170
       165
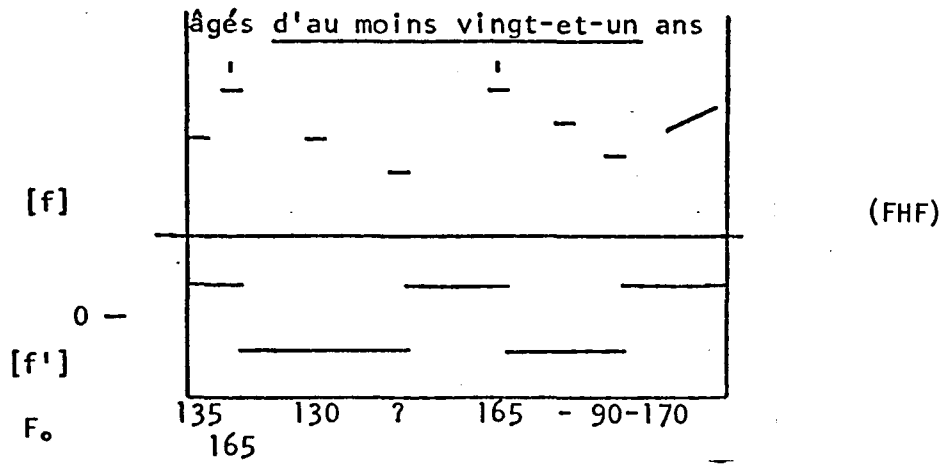
("at least 21 years old")

Here, we have high accents (that is, accented syllables that are on
a higher pitch/F₀ level than the preceding syllable) followed by a
descent. Similar patterns are shown in [7b,c], except that the high
accents are preceded by an ascent ([7b]) or a level sequence ([7c]).

[7b]

Cette résistance extérieure

[f]

(RHF)

0 —

[f']

F₀   140 175   240   145 ?   160
      ±10   215   ±20
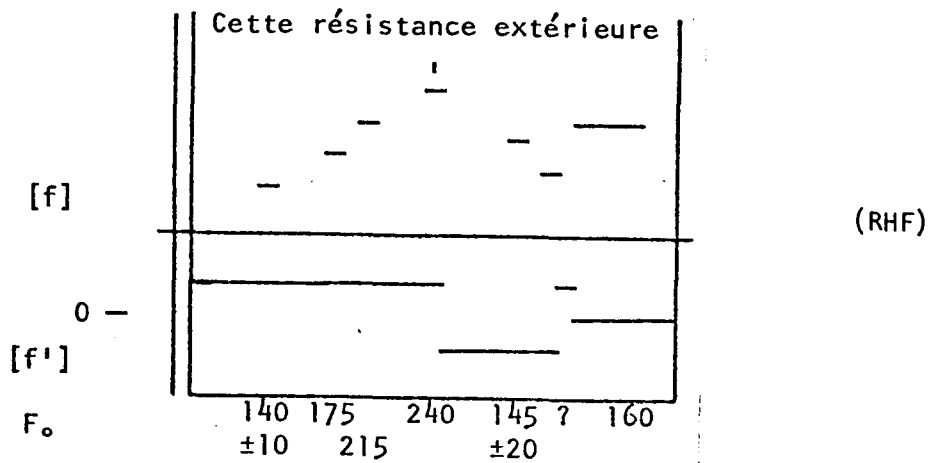
("This external resistance")

[7c]

qui n'avaient pas été touchées

[f]

(LHF)

0 —

[f']

F₀   ?   ?   ?   140   ?   ?   ?
                    -120
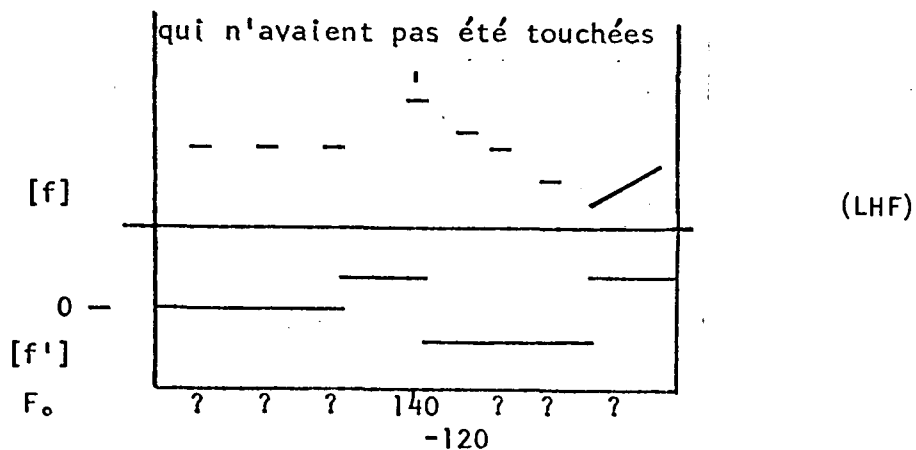
("who had not been touched")

(We have used the symbols R,F and L to indicate ascents, descents and levels, and H to indicate a high accent). In fact, in almost every case where a high accent is found, the pattern following it is descending, rather than level or ascending. To account for this, we can write rule [8].

[8] $[-A] [+A] [-A]_0 \rightarrow$

        $| +R | +F |$

(Recall that a full version of this rule would specify the environment $|W \ldots X|$). Now consider the following examples involving level accents (indicated by "0").

[9a,b,c]

en dix-neuf cent quarante trois

[f]   (ROF)

0 —

[f']

F₀   ? 205 >210   >210 160 ?   ?

("in 1943")

à affronter les difficultés d(e) la vie

[f]   (FOF)

0 —

[f']

F₀   95   165   145 135   125
        135   180   - 150 135   90-?
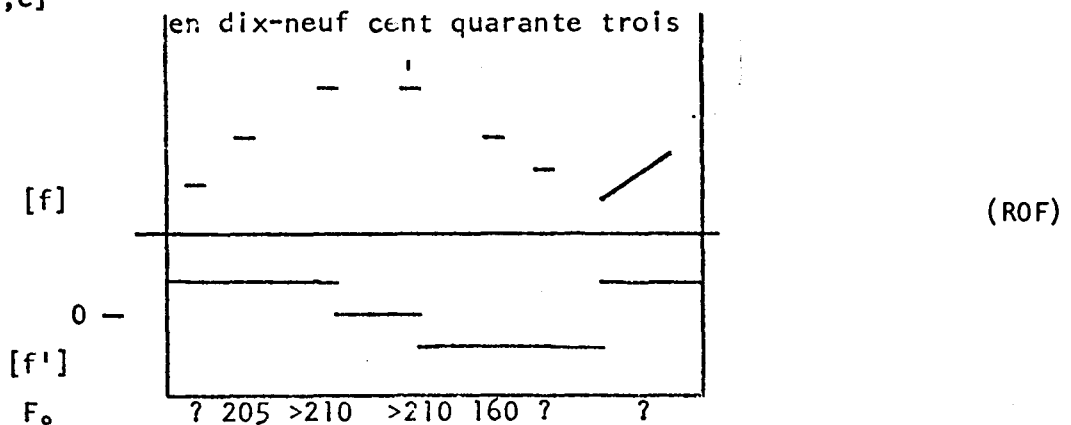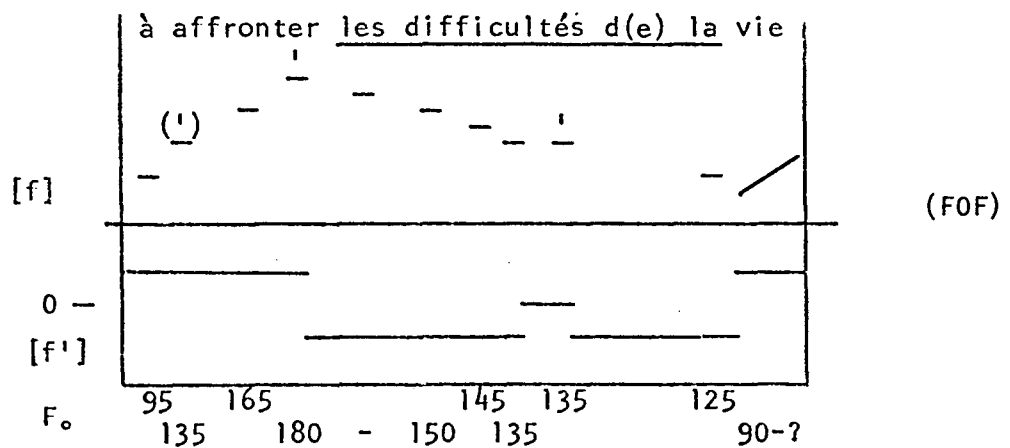
("to face up to the difficulties of life")

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Si le scénario exigeait un médecin

[f]

(LOF)

0 —

[f']

F_c

130 140   -160 ? ? 95 <95 ?
120   -105   -?
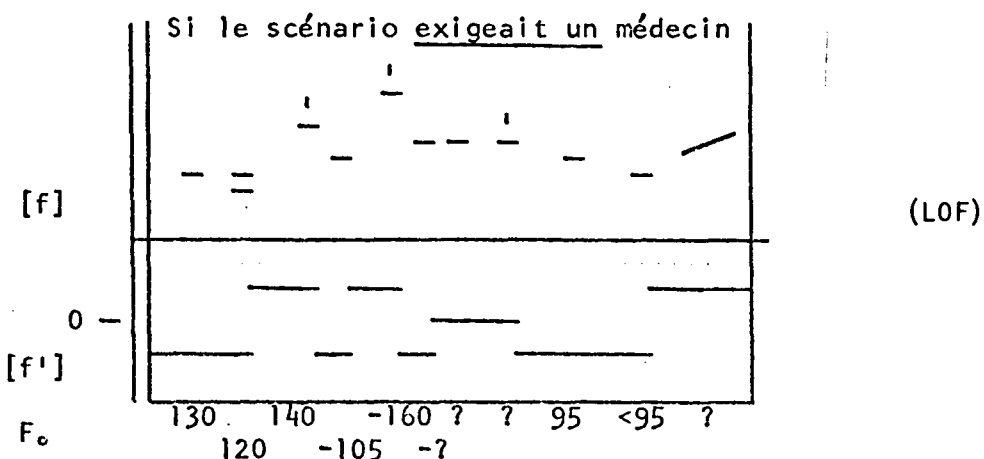
("if the scene required a doctor")

Again, the accents are preceded by various types of pattern -
ascending in [9a], descending in [9b], level in [9c] - and as
before, the ascent is in each case followed by a descent. To
account for this, we need merely to generalise rule [8] slightly.

[10]　　　　　[-A] [+A] [-A]
　　　　　　　　　　　　　→
　　　　　$\left| \begin{array}{c} \alpha R \\ -F \end{array} \right| +F \left. \right|$

Next, we consider some examples involving low accents (indicated by L):

[11a]
Dans les industries ....

[f]

(RLR)

0 —

[f']

F_c

185-220   215   215
210

("In the industries ...")

[11b] (| soit par ceux qui n'ont pas été ....)
        .... choisis pour jouer un rôle

[f]   (FLR)

  0 —

[f']

Fo   115 ?   ? 100
                      120 - 175
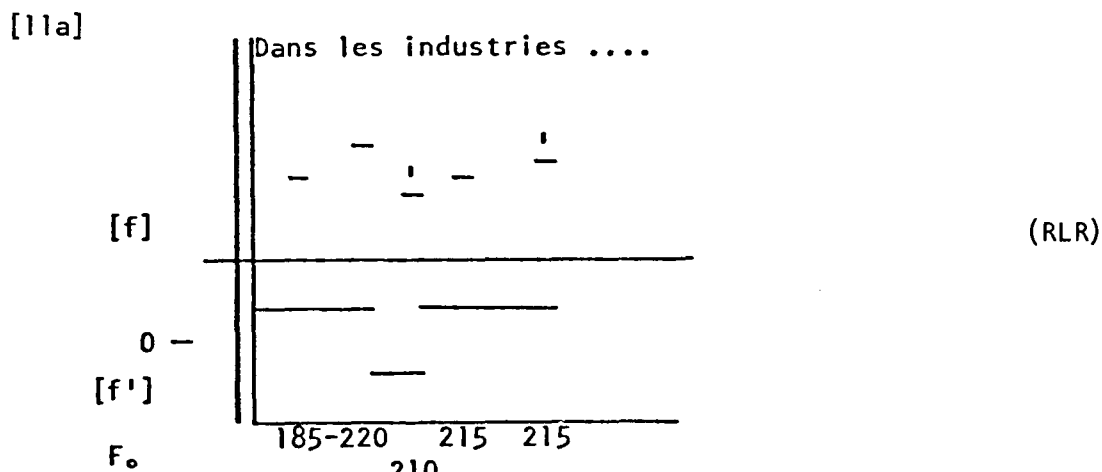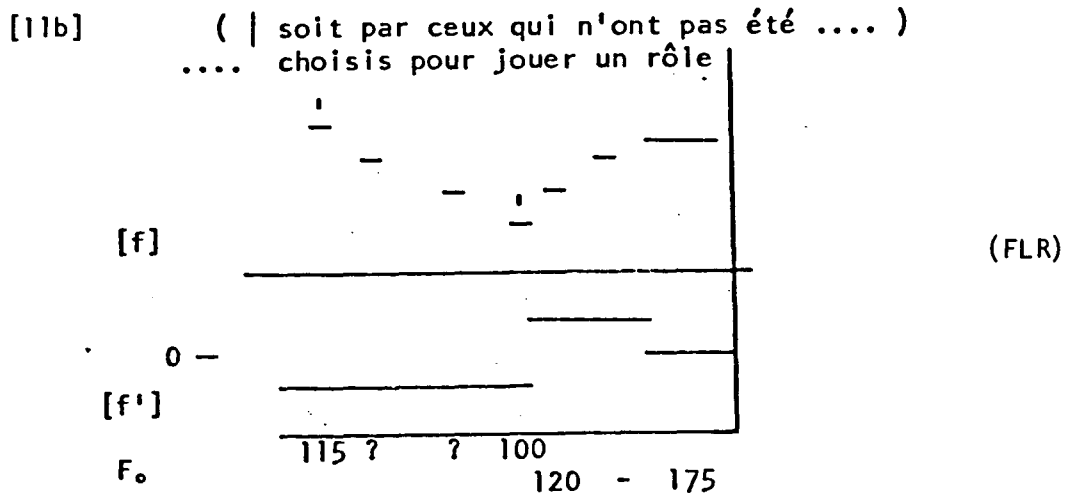
("either by those who have not been chosen to play a part")

[11c]   que les enterrements ....

[f]   (LLF)

  0 —

[f']

Fo   ?   ? 120 115   135
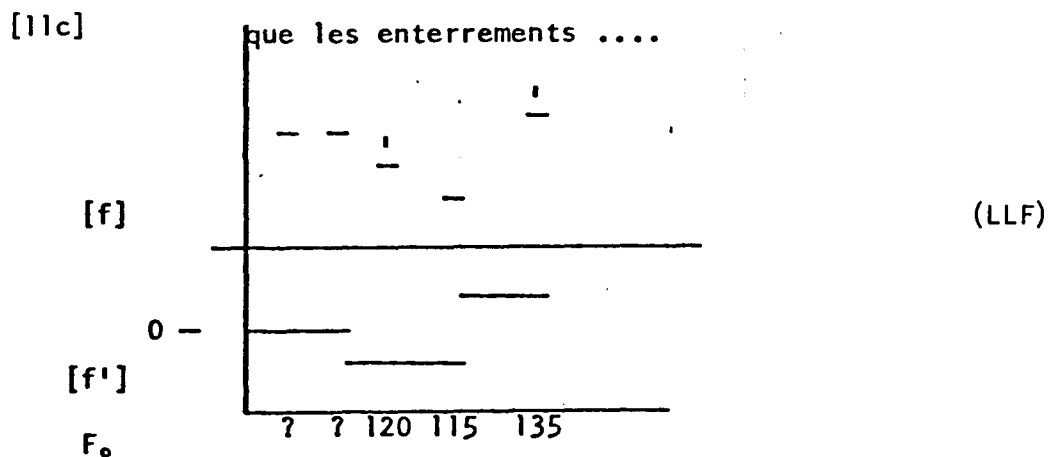
("that burials ...")

[11a], in which the low accent is preceded by an ascending sequence,
and [11b], in which it is preceded by a descending sequence, are alike
in that the accent is followed by an ascent. [11c], on the other hand,
in which a level sequence precedes the low accent, presents a problem:
the accent is followed by a descent.

One way round this would simply be to write a pair of rules such as
[12a,b].

[12] (a)   [-A] [+A] [-A]$_0$

                 $\begin{vmatrix} \alpha R \\ -\alpha F \end{vmatrix}$ →

                      | +F |+R|

(b) $[-A] [+A] [-A]_0$

$$\begin{vmatrix} -R \\ -F \end{vmatrix}$$

$|\quad +F\quad |$ →

(We leave aside for the moment the question of the origin of the
level sequence in the input to [12b]). On the other hand, we might
first generate ascents after all low accents, and then transform an
ascent into a descent in cases where the low accent is preceded by
a level sequence. This would require [13a,b].

[13] (a) $[-A] [+A] [-A]_0$ →

$|\ +F\ |+R|$

(b) $[-A] [+A [-A]_0$

$\begin{vmatrix} -R \\ -F \end{vmatrix}+F|$

$|\ +F|$ →

[11c] would thus be generated via a pattern of the form

$$- \ - \ -\ _1\ \overline{-}$$

Which of these two solutions should be choose? There are two reasons
for preferring the second. First, [13a,b] are no more complex, and,
if anything, are slightly simpler than [12a,b]. Second, and more
important, if we adopt the solution involving [13a], we can simplify
our overall analysis by combining [13a] with the rule for high and
level accents, rule [10], which is clearly a considerable advantage.
We therefore replace [10] and [13a] by [14].

[14] $[-A] [+A] [-A]_0$

$$\begin{vmatrix} \alpha R & & \beta R \\ \beta F & & -\beta F \end{vmatrix}$$

Our analysis therefore comprises just rules [14] and [13b].

Next, we take up the question of the origin of the [-R,-F] sequence
specified in the input to [13b], and, indeed, of level sequences in
general. Consider the following four examples:

[15a]

le Sénat qui a la faculté de demander ...

[kja]

[f]

0 —

[f']

F₀

? 190   ?   ? 135 130   ? ? ?
     -160   130   ?
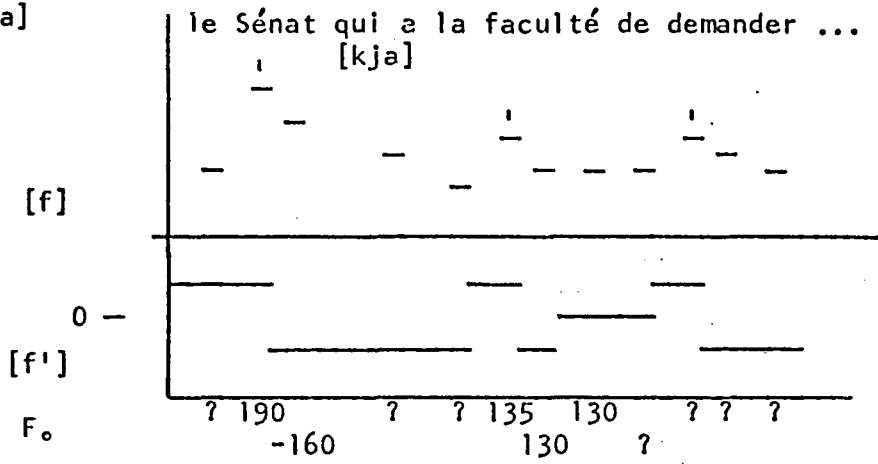
("the Senate, which has the power to ask ...")

[15b]

qui dirigent l'économie nationale

[f]

0 —

[f']

F₀

170   230   165   145-230
-145   150 - 150
   210

("who direct the national economy")

[15c]

et à la télévision d'état

[f]

0 —

[f']

F₀

140   160   ? ? 160   ? ?
   155   135
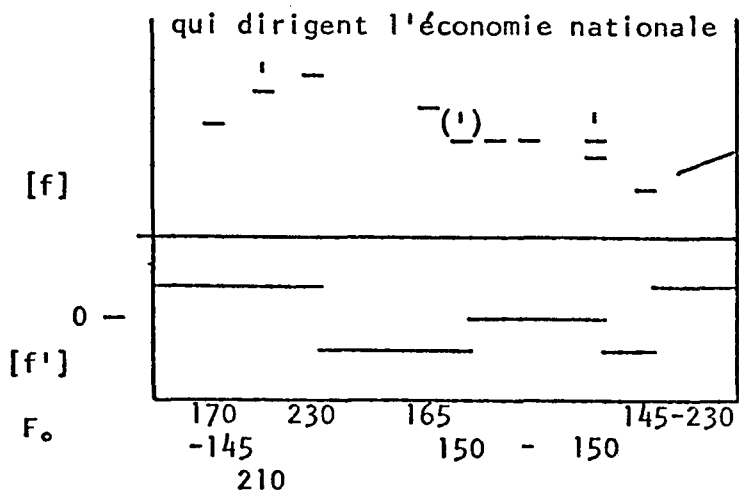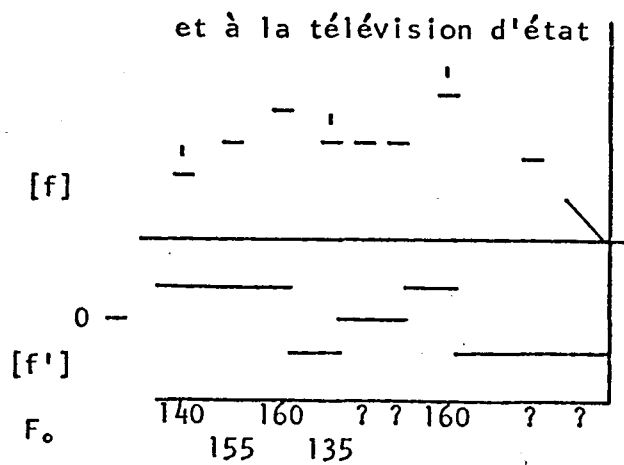
("and on state television")

[15d]

|avec les étudiants|
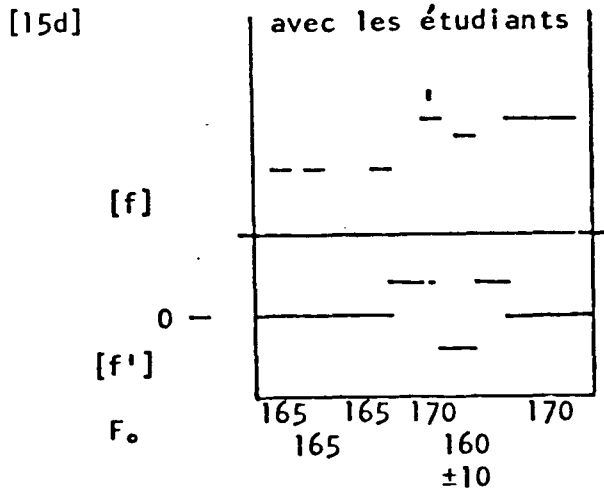
("with the students")

Together, these examples illustrate all the preceding environments in which level sequences are to be found. Not surprisingly, they are not found directly after level accents, since a sequence of level accent + level sequence, that is, a string of the form

$$- \perp - - -$$

would hardly constitute an effective means of signalling the presence of the accent, which would be deprived of its intonational prominence, and thus, effectively, be deaccentuated. Schematically, the environments are of the form [16a-e], corresponding to [15a-d] respectively.

[16] (a) $- \overset{\perp}{} - \underline{\quad}$ (b) $- \underset{\perp}{} \underline{\quad}$

(c) $- \overset{-}{} \perp \underline{\quad}$ (d) $- - \perp \underset{-}{} \underline{\quad}$

(e) $\Big|\underline{\quad}$
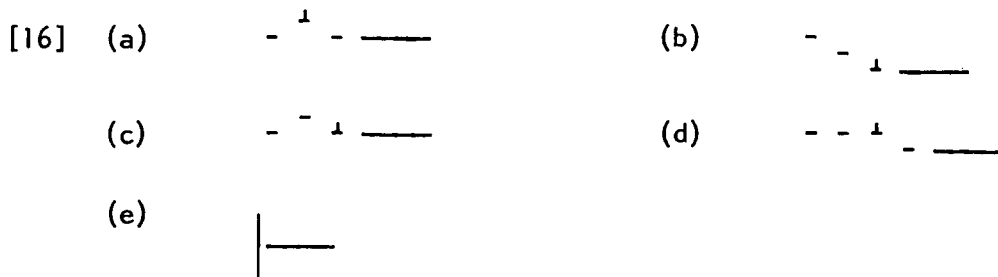
Notice that after a high accent, as in [16a], or after a level accent, as in [16d], there is an obligatory step down onto the level sequence, that is, we do not find patterns of the form

$$\underset{-}{\perp} \underline{\quad} \quad \text{or} \quad - \perp \underline{\quad}$$

On the other hand, after a low accent, there is not, as one might perhaps expect, a step up onto the level sequence, that is, we do not find patterns of the form

$$- \underset{\perp}{} \overline{\quad}$$

The rule we need to account for these data is given as [17].

[17] $\left| \begin{Bmatrix} W[\alpha A][-\alpha A] \\ |+F| \end{Bmatrix} \ldots [-A]_k\ Y \right| \quad \rightarrow$

$$\left| \begin{matrix} -R \\ -F \end{matrix} \right|$$

This abbreviates the three subrules given in [18].

[18] (a) $\left| \begin{matrix} W[+A][-A] \ldots [-A]_k\ Y \\ |+F| \end{matrix} \right| \quad \rightarrow$

$$\left| \begin{matrix} -R \\ -F \end{matrix} \right|$$

(b) $\left| \begin{matrix} W[-A][+A] \ldots [-A]_k\ Y \\ |+F| \end{matrix} \right| \quad \rightarrow$

$$\left| \begin{matrix} -R \\ -F \end{matrix} \right|$$

(c) $\left| \ldots [-A]_k\ Y \right| \quad \rightarrow$

$$\left| \begin{matrix} -R \\ -F \end{matrix} \right|$$

[18a] applies to strings containing high or level accents, since it
is these that are followed by a $|+F|$ specification; it therefore
generates the patterns of [16a] and [16d]. [18b] deals with low
accents, and thereby accounts for [16b] and [16c]. Finally, [18c]
applies to strings of unaccented syllables at the beginning of a
phrase, generating patterns of the form [16e].

To complete our analysis, we need a rule to generate ascending or
descending patterns on sequences of unaccented syllables at the
beginning of a phonological phrase. This is accomplised by rule [19].

[19] $\left| [-A]_j \ldots [-A]_k\ Y \right|$

$$\left| \begin{matrix} \alpha R \\ -\alpha F \end{matrix} \right|$$

     where $o < j < k$

In summary, our analysis comprises rules [13b], [14], [17], [19], with
[13b] intrinsically ordered after [17], and [17] ordered after [14].
We illustrate the operation of these rules, and of the rule for nuclear
tones, [5], with the following example. I assume that the rules apply
left to right in the phonological phrase, although nothing crucial
hinges on this. [20a] gives the example itself, and [20b] shows its
derivation, the rule that applies to generate a particular line being
given to the left of that line.

[20] (a)
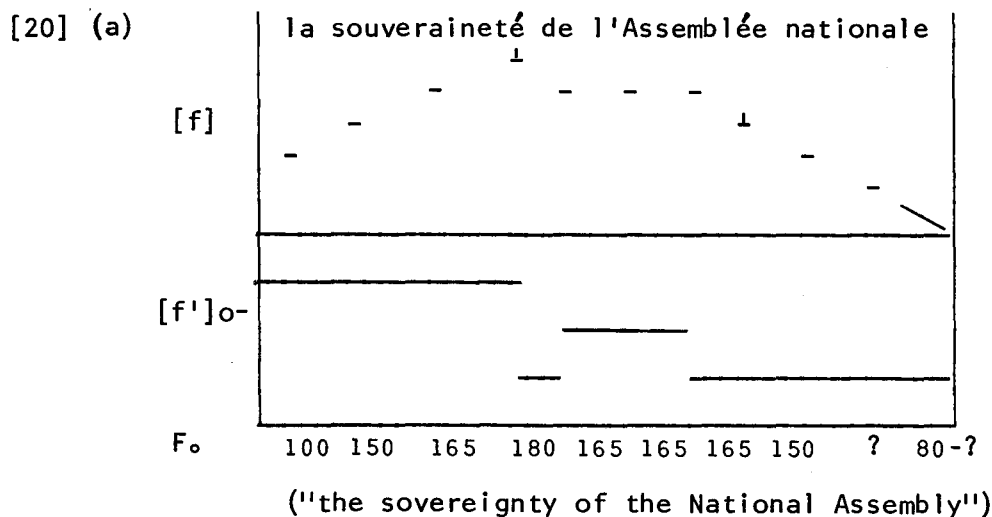
la souveraineté de l'Assemblée nationale

[f]

[f']o-

Fo 100 150 165 180 165 165 165 150 ? 80-?

("the sovereignty of the National Assembly")

(b)

$$\left|\begin{bmatrix}\text{la}\\-A\end{bmatrix}\begin{bmatrix}\text{sou-}\\-A\end{bmatrix}\begin{bmatrix}\text{-veraine-}\\-A\end{bmatrix}\begin{bmatrix}\text{-té}\\+A\end{bmatrix}\begin{bmatrix}\text{de}\\-A\end{bmatrix}\begin{bmatrix}\text{l'A-}\\-A\end{bmatrix}\begin{bmatrix}\text{-ssem-}\\-A\end{bmatrix}\begin{bmatrix}\text{-bleé}\\+A\end{bmatrix}\begin{bmatrix}\text{na-}\\-A\end{bmatrix}\begin{bmatrix}\text{-tio-}\\-A\end{bmatrix}\begin{bmatrix}\text{-nale}\\+A\end{bmatrix}\right|$$

rule											
[18]		+R -F									
[14]			+R -F		-R +F						
[17]					-R -F						
[14]							-R +F		+R -F		
[13b]									-R +F		
[5]											-R +F : -R +F
output:			+R -F		-R +F	-R -F			-R +F		

2.4 So far, we have concentrated on the processes that assign intonation contours to sentences previously unspecified intonationally, although in doing so, we have seen the necessity for the grammar also to contain rules, such as [17] and [13b], that change the shape of contours assigned by earlier rules. [17] and [13b] are not unique in this respect, and in this section I shall consider two other processes that involve transformation of intonation contours, one obligatory and one optional.

First, we consider some more data relating to low accents (accents that are on a lower pitch/Fo level than the preceding syllable). We have seen that such accents are generally followed by an ascending sequence of unaccented syllables, at least when they are not preceded by a level sequence. The following example, however, shows that this is not always the case.

[21]

Dans les deux premiers cas

[f]

0 —

[f']

F₀

? ? ? 170 ? 115-
145
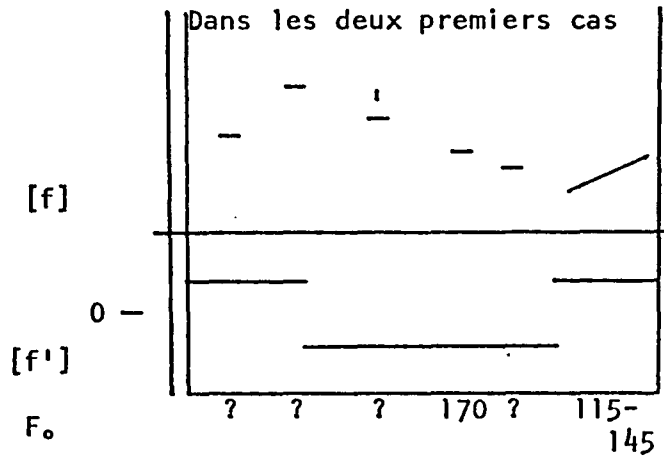
("In the first two cases")

How are we to explain this apparently anomalous behaviour? Notice that the patterns we have now met are those diagrammed in [22a(ii), b(i)] and [23a(ii), b(ii)], whereas related patterns of the form [21a(i), b(ii)] and [23a(i), b(i)] are not attested.

[22]   (i)   (ii)

(a)

(b)

[23]   (i)   (ii)

(a)

(b)
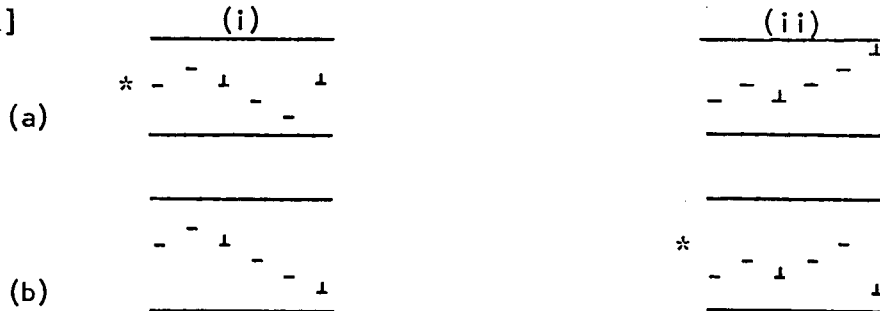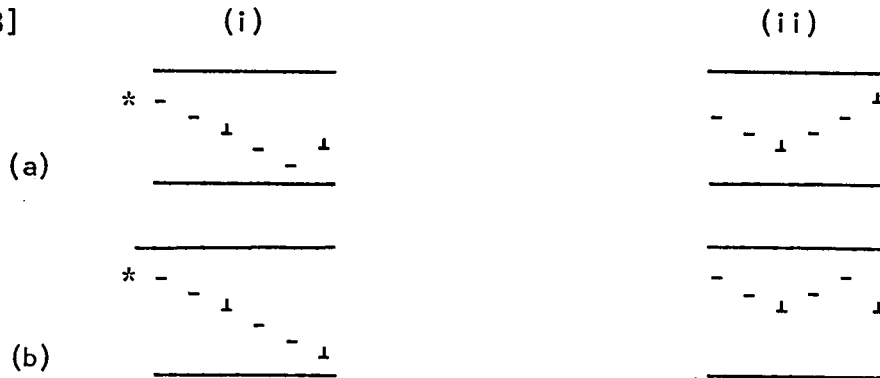
The reason for the absence of [23a(i), b(i)] is obvious: such patterns deprive the accents of their intonational prominence. [22] is somewhat more complex, but also displays a clear pattern: low accents that are preceded by an ascent are followed by an ascent if the next accent is high ([22a]), and by a descent if the next accent is low ([22b]).

Now the rules we have developed so far account for all these patterns,
except that they generate [22b(ii)] instead of [22b(i)]. One way of
remedying this defect would be to modify the already existing rules;
but as it turns out, this would be no easy matter. An alternative
solution would be to write a rule transforming [22b(ii)] into [22b(i)];
this is quite straightforward, and is accomplished in rule [24].

[24]   ... [-A] [+A] [-A]$_1$ [+A]

            |+R| +F | +R | +F |

                      ↓
                   |+F |

This rule is quite a simple one, and, moreover, can plausibly be
claimed to be a rather natural one, in that the process it expresses
is clearly assimilatory in nature. In particular, we see that the
intonation pattern on a sequence of unaccented syllables is assimilated
to that associated with the adjacent accented syllables; and although
obviously very little is known at present about what constitutes a
natural process in intonational phonology, this would seem, a priori,
to be a fairly good candidate for being considered as such.

The second type of intonational transformation I should like to
consider is an optional one. Consider the following examples (the
relevant parts are underlined where necessary):

[25a]   (i)   en refusant toute forme d'organisation

| | 185 | 345 | 260 | | 300 | 260 | – | | 145 | 255 |
| F$_o$ | | | 300 | | | -325 | | | 165 | |
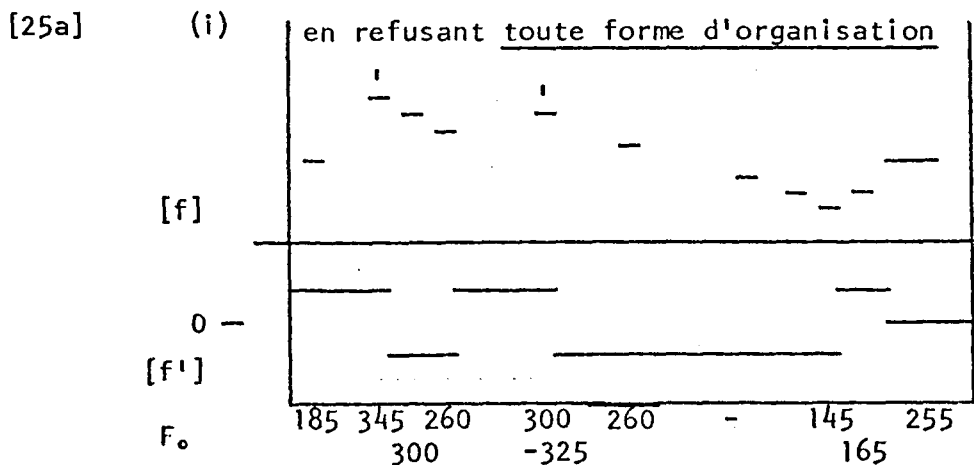
("in rejecting any form of organisation")

[25a] (ii)

Le véritable pouvoir

[f]

0 —

[f']

F_o 160   250   160-   160-
       205   -140 145   260
       -300

("The real power")

[25b] (ii)

ne doit pas être utilisée comme critère

[f]

0 —

[f']

F_o 105 105 160   ? >100   90   ? 100-
                 155   100   ?   140
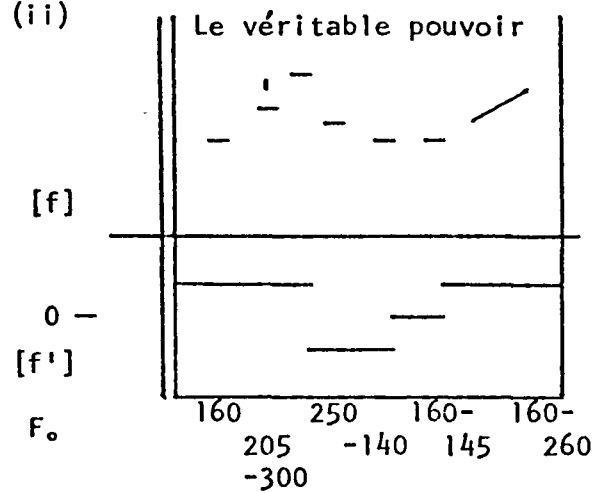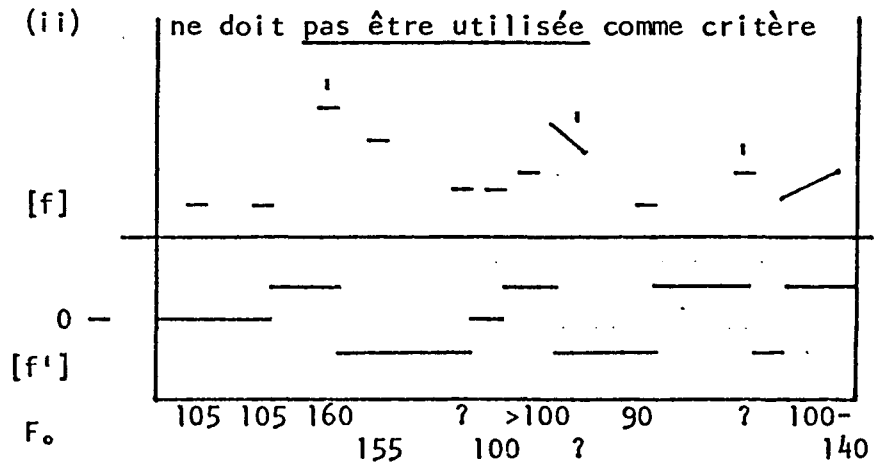
("should not be used as a criterion")

[25c] (i)

qui n'était pas originaire de Guérande

[f]

0 —

[f']

F_o ?   95   ?   120 ? ? ? 110   ?   ?   120-
                                                 155
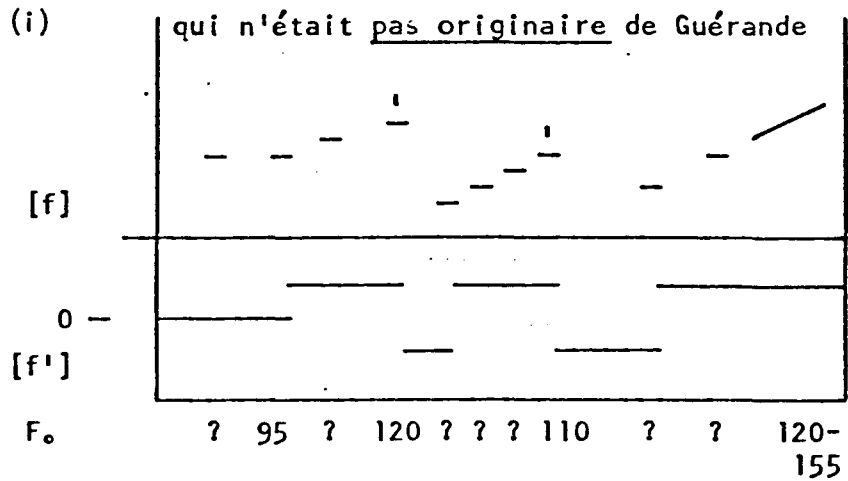
("who was not a native of Guérande")

[25c]   (ii) | risquent de n'avoir | (aucun succès.)

[f]

0 —

[f']

F₀   130- ?   ?   ?   125-
      155   140
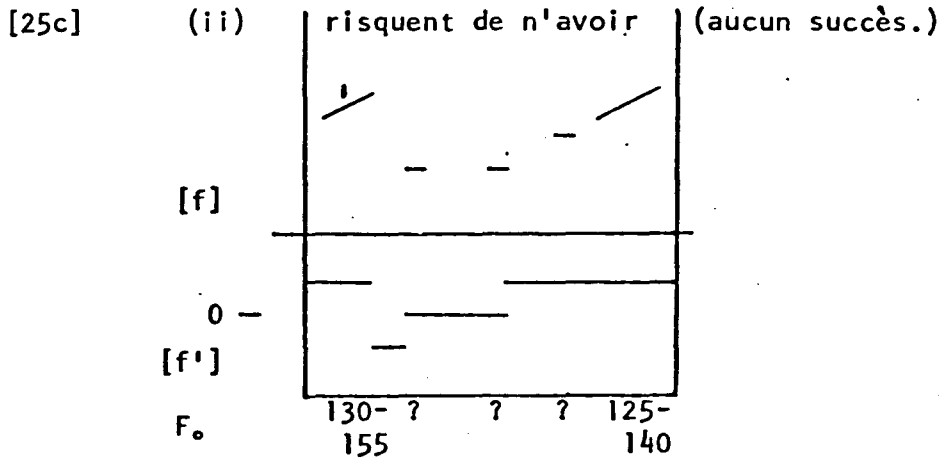
("are in danger of failing")

Each of these examples involves a high accent followed, as we expect, by a descent. (The beginning of the descent is somewhat delayed in *véritable* in [25a(ii)]; this is due to a process known as "spreading", which does not concern us here). According to the rules developed so far, in particular, rule [14], the descent ought to continue as far as the next accent, but in each case, the descent is cut short, or truncated. In [25a], the truncation affects only the last of the sequence of unaccented syllables following the high accent; in [25a(i)], this is higher than the preceding syllable, and in [25a(ii)] it is on the same level. In [25b], the truncation effects a string of syllables beginning in the middle of the descending sequence; in this example, the first syllable affected is on the same level as the preceding syllable - I assume that the lack of an example [25b(i)], with the first affected syllable higher than the one preceding it, is merely fortuitous. Finally, in [25c], the descent after the high accent has been cut so that it affects only the immediately following unaccented syllable; as before, we may have a straight ascent, as in [25c(i)], or an ascent preceded by a brief level sequence, as in [25c(ii)]. Notice, finally, that in all of these examples, the accent that follows the truncated descent is high.

This last observation gives a clue to the nature of the process involved, for it seems natural to assume that the pattern on the unaccented syllables is being assimilated to that associated with the following accent. That is, a descent becomes an ascent when followed by an ascent. A rule that captures these observations is [26].

[26]   [+A] ... [-A]$_j$ [-A]$_k$ ... [-A]$_m$ [+A]
             | +F | +R |
                                                        →
                    | -F | +R |

        where o < j = {k, k - 1}
        and $k \leq m$

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If $j=k$, the [-F] part of the output is inoperative. The patterns generated by this rule under the various values that can be assigned t j,k are diagrammed below.

[27] (a) j = k; k < m

[25a(i)]

(b) j = k-1; k = m

[25a(ii)]

(c) j = k-1; k < m
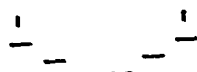
[25b(ii)]

(d) j = k; k < m

[25c(i)]

(e) j = k-1; k < m
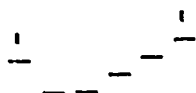
[25c(ii)]

Although [26] clearly generates the observed patterns, one might ask whether it is really the most adequate formulation available. In particular, one might well criticise it for treating the cases involving a level sequence (namely [25(ii) b(ii) c(ii)]) as being different in kind from those which do not (namely [25a(i), c(i)], also [25b(i)], if it existed). For surely, although these cases might be transcribed differently, it is hardly plausible to assume any radical difference in their fundamental frequency contours or even perhaps in their pitch contours. (Recall the caveat, expressed earlier, concerning the [f]- patterns in the examples we give: they are to be regarded as auditory transcriptions rather than as representations of perceived pitch contours). In other words, the pitch/ fundamental frequency contours of all these examples assume the following form:

and it is merely a question of the location of syllable boundaries (thus properly a segmental rather than a prosodic question) whether we match this up in the transcription as

rather than

Acceptance of this as a valid criticism points to the need for greater flexibility in the formalism we have devised for representing intonation patterns. So far, we have permitted discontinuities in the [f']-patterns to be located only within syllables. If we were now to relax this constraint, so as to permit discontinuities to coincide with syllable boundaries, we could represent the two patterns in question as shown in [28(i)] and [28(ii)], corresponding to the (i)- and (ii)-numbered examples of [25] respectively.

[28]   (i)   (ii)

    |+F | +R| | +F | +R |

The two types of output for rule [26] could then be represented as in [29(i), (ii)].

[29]   (i)   [+A] ... [-A]$_j$ [-A]$_k$ ... [-A]$_m$ [+A]
                   | +F | +R |

           (ii)   [+A] ... [-A]$_j$ [-A]$_k$ ... [-A]$_m$ [+A]
                   | +F | +R |

A suitable notation for the rule would be that illustrated in [30]

[30]   [+A] ... [-A]$_j$ [-A]$_k$ ... [-A]$_m$ [+A]
                    | +F | +R | →

                       |——| +R |

          where o < j = (k-1)
                $k \leq m$

where the |——| indicates that the discontinuity may be located at any point in between the two verticals.

It seems to me that this proposal goes some way towards what is needed for a sufficiently precise and flexible representation of the matching between the syllabic and prosodic structure of sentences, and at least has the virtue of allowing the assimilation process we are dealing with to be expressed in a more adequate fashion. But whether it will prove entirely satisfactory is rather doubtful, in my view. It is well known that the precise positioning of discontinuities in pitch/F_0 contours plays an important role in the signalling of intonational prominence, and it is likely that the system developed here is still not flexible enough. On the other hand, further refinement is clearly possible, and there is no reason to suppose that the system will not be equal to the task of representing whatever finer distinctions should eventually prove to be called for.

2.5 To summarise the results of this section, we first of all developed
      a method for representing intonation contours not directly in terms
      of pitch/fundamental frequency variations, but rather in terms of
      rates of change of pitch/F_0 contours, in other words, in terms of
      ascents, descents, and level sequences. At the expense of this
      minimal complication at the phonetic level, we have been able to
      develop a considerably simpler phonology of intonation than has
      hitherto been possible. We illustrated this by constructing a
      partial generative grammar of French intonation at the level of the
      phonological phrase. This involved two types of rules: first of
      all, those that assigned intonation patterns to previously unspecified
      sentences, and second, rules that effected certain transformations
      of already existing intonational structures. In this way, a wide
      range of patterns could be generated by means of only a small number
      of relatively simple rules.

      We should now go on to ask how closely the structures generated by
      our fragmentary grammar correspond to phonetic reality. It is clear
      that our approach has involved a large number of idealisations. For
      instance, it seems that an adequate description of intonation should
      include not only variations in pitch/fundamental frequency, but also
      loudness/intensity, and also various rhythmic factors. Of course, we
      have not tried to take any of these into consideration. Even as
      regards pitch/fundamental frequency, there are many details which we
      have made no attempt to account for, for example, those involving the
      micro-structure of pitch/F_0 contours, and the perturbations due to
      voiceless and consonantal segments. Of rather greater importance are
      factors more narrowly intonational in nature, and I shall briefly
      discuss a number of these.

      First, as remarked earlier, the system provides for only three degrees
      of rate of change of pitch/fundamental frequency, namely ascending,
      descending, and level. It is clearly important to ask whether the
      intonation patterns of whatever language we are dealing with involve
      just this three-way distinction, or whether further elaboration is
      called for. This question should, in fact, be rephrased as two
      questions, one relevant to the phonological level, one to the phonetic
      level.

      Phonologically, we must examine the intonation patterns of the
      language with a view to determining how many contrasts of degrees of
      ascent/descent form distinctive oppositions. So far, our system
      allows for a set of distinctive oppositions involving just three
      terms, although in fact, as mentioned earlier, this is already known
      to be inadequate for French intonation, for which at least one
      additional degree of ascent must be posited. This,in my view, is
      in fact not a crucial question for assessing the adequacy of the
      theory as a whole, since the system we have developed is clearly
      flexible enough to enable a wider range of distinctive oppositions
      to be accommodated, should the need arise, simply by allowing a
      wider range of coefficients for the features [Rise] and [Fall].

Phonetically, we need to examine whether the rates of change of pitch/fundamental frequency contours found in actual utterances are in fact expressible in terms of the three-valued function f' we have been using. It does not require any detailed acoustic analysis to decide that this is not the case, and that the function f' must take on many more values than three. To that extent, it is clear that the grammar we have developed is insufficiently explicit at the phonetic level. What is not so clear is what the relevant facts are, and what additional considerations must be taken into account beyond those we have looked at so far in order to accommodate those facts. As regards the former problem, a need first of all for more reliable F_O measurements than are available to me at present, but also for knowledge of difference limens in the perception of rates of change of pitch: there is little point in trying to write a grammar that goes beyond what is perceptually relevant. As for the second problem, namely that of determining the factors that control non-distinctive variations in the f'-pattern, it is fairly easy to make speculations. For instance, it is presumably the case that higher absolute values of the function f' are found towards the centre of a speaker's pitch/F_O range, that is, the lower the level of his voice, the less rapid the descents he can produce, and the higher the level of his voice, the less rapid the ascents he can produce. In other words, f' is in part a function of f. Second, one might expect that given a sequence of unaccented syllables with a descending intonation pattern, the rapidity of the descent will depend on the number of syllables in the sequence, the greater the number of syllables, the less rapid the descent. Third, one might expect to find a correlation between rates of change of pitch/fundamental frequency and rates of change of amplitude, since both are partially related in production to the level of subglottal pressure. However, although it is easy enough to speculate in this way, to do so seems to be rather futile in the absence of precise quantitative data. I shall therefore leave this problem open.

A second area in which the theory we have elaborated is probably insufficiently explicit is in the matching up of intonation patterns with the segmental structure of an utterance. This was discussed briefly at the end of the last sub-section, and I have nothing to add to the discussion there.

Finally, we note that although our grammar might generate intonation patterns of approximately the right shape, these patterns are speci- fied in a purely relativistic way, in the sense that absolute values of pitch/fundamental frequency are not specified. These values clearly depend on a number of factors. Among the (for our purposes) less important ones are, for example, those relating to individual speaker characteristics, and to the emotional content of the utterance. Of rather greater interest are those that relate more to information-content of the utterance, and, in particular, those that have to do with the phonological structure of the utterance as expressed by the relative pitch/F_O levels of successive phonological phrases. This is an important topic, because it relates to the question of how intonation is linked to syntax, and it is to this problem that I shall address myself in the next section.

3.1   In this section and the next I shall discuss the relation of
intonation to syntax. It will become apparent first how much of
intonation is not directly determined by syntactic factors, in other
words how wide a range of intonation patterns are compatible with
any given syntactic structure, and second how complex the relation
is, in other words how difficult it is to infer the syntactic
structure of an utterance from consideration of its intonation
contour. This last point has obvious implications for theories of
speech perception.

The crucial notion in this area is that of phonological structure.
It is standard practice in linguistics, as indeed in any science,
when faced with a set of data to be accounted for, to posit abstract
categories, together with a set of statements specifying the
relations holding among these categories, and (loosely speaking)
between the categories and objects in the real world. Thus we posit
phonemes in order to account for the surface distribution of phones
or allophones, and we posit deep or underlying syntactic structures
in order to account for the distribution of words or morphemes.
Since one can choose one's data at a number of different linguistic
levels (phonetics, phonology, morphology, syntax, semantics),
linguists who seek to construct an overall model of language are
constantly presented with interface problems, that is, how to tie in
or reconcile the results obtained at one level with the results of
analysis at another level. Thus strings of phonemes obtained from
phonological analysis have to be related to the morphemes posited
in morphological analysis, which in turn have to be related to
syntactic units, which in turn have to be related to semantic units.
Now exactly the same situation holds when we discuss the relation
between intonation and syntax: on the one hand, we have syntactic
surface structure, and on the other, the structure obtained as a
result of phonological analysis, which is posited expressly in order
to account for various intonational phenomena. This latter level of
representation I call phonological structure. It should be emphasised
that the phonological structure of an utterance is set up on purely
phonological grounds in order to account for intonational (and other)
phenomena. Initially, syntactic considerations are excluded, so that
it is an empirical question as to how the levels of phonological and
syntactic structure correspond.

Let us begin by considering some of the formal properties of phono-
logical structure. Like syntactic structure, phonological structure
provides a hierarchically organised representation of an utterance in
terms of a number of abstract categories. The categories in question
may conveniently be called *phonological sentence, phonological clause,
phonological phrase, phonological word.* (There are also others, such
as *syllable* and *segment,* which are of less interest for our purposes).
One difference between syntactic and phonological structure is that
whereas the former permits "rank-shifting", the latter does not. That
is, in syntax, the category Sentence may dominate the category Noun
Phrase, for instance, and Noun Phrase may also dominate Sentence. In
phonological structure, this type of situation is excluded; if a
category A dominates a category A', then A' may not dominate A.

A further and even tighter constraint on the form of phonological
structures is that if, in a given utterance, a category A directly
dominates two categories B and B', then B and B' must be the same
category. Thus we may have representations equivalent to those of
[31a], but not to those of [31b], using the notation PS for "phono-
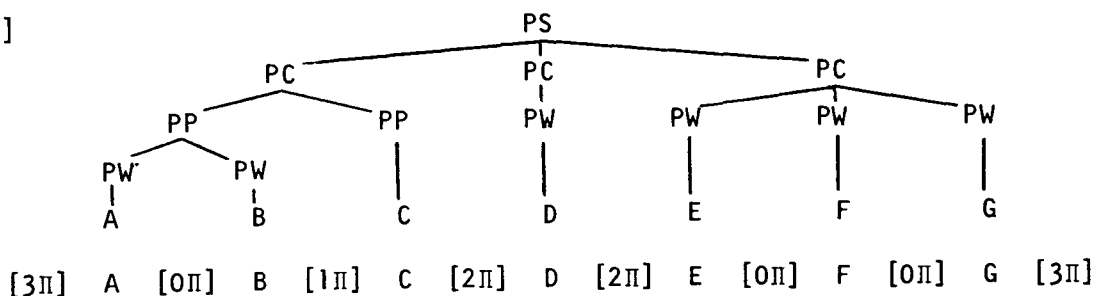logical sentence", PC for "phonological clause", and so on.

[31]

(a)

```
              PS
        ┌─────┼─────┐
       PC    PC     PC
      ╱  ╲
    PW    PW
```

```
              PC
        ┌─────┼─────┐
       PP    PP     PP
      ╱ ╲         ╱ ╲
    PP   PP     PW   PW
```

(b) *

```
              PS
        ┌─────┼─────┐
       PC    PC     PP
```

*

```
              PC
        ┌───────────┐
       PP          PP
      ╱ ╲
    PC   PC
```

Now it is usual, when dealing with syntactic structures, to make
use of the type of notation known as labelled bracketting, or,
equivalently of phrase markers (tree diagrams). For phonological
structure, however, labelled bracketting is an unsuitable notation
in that it permits the representation not only of possible structure
like those of [31a], but also of impossible ones, like those of [31b].
We therefore need a more highly constrained notation, one which will
permit the representation of all and only the possible structures.
Such a notation may appropriately take the form of a system of bound-
aries. Each boundary consists of a complex of features, among which
is one, which I shall call [Π], that differentiates between
phonological sentence boundaries, phonological clause boundaries,
and so on. Making [Π] a scalar feature, we may adopt the following
notation:

phonological sentence boundary (psb) : [3Π] (or Π̄̄)
phonological clause boundary (pcb)   : [2Π] (or Π̄)
phonological phrase boundary (ppb)   : [1Π] (or Π)
phonological word boundary (pwb)   : [0Π] (or ##)
boundaries weaker than pwb   : [<0Π]

The equivalence between the boundary-based representation and
representation in terms of phrase markers (hence also in terms of
labelled bracketting) is illustrated in [32].

[32]

```
                                    PS
            ┌───────────────────────┼──────────────────────┐
           PC                      PC                       PC
        ┌───┴────┐                  │              ┌────────┼────────┐
       PP        PP                PW             PW        PW        PW
      ╱ ╲         │                 │              │         │         │
    PW   PW       │                 │              │         │         │
     │    │       │                 │              │         │         │
     A    B       C                 D              E         F         G

  [3Π]  A  [0Π]  B  [1Π]  C  [2Π]  D  [2Π]  E  [0Π]  F  [0Π]  G  [3Π]
```

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The feature [Π] can be seen as expressing one aspect of the relative
strength of boundaries, the strength hierarchy going from psb
(strongest) to pwb (weakest). It turns out, however, that even within
each of the categories defined by the feature [Π], further distinctions
of boundary strength must be made. In order to represent these, we
make use of a further feature, [Ψ]. We naturally want stronger bound-
aries to have higher valued coefficients for this feature than weaker
ones, and for practical reasons, it is convenient to let the
coefficients of [Ψ] range over the set {0, -1, -2, ...}.

A third property of boundaries we need to take into account is the
length of pause with which they are associated. We posit another
feature, [Pause], for this purpose. In French, it seems that there
is a primary distinction between three lengths of pause, with a
secondary distinction between longer and shorter versions in two of
the three primary types. This gives a five way distinction in all,
which I shall represent by means of the coefficients 0,1,2,3,4 of
the feature [Pause].

Phonological structures thus take the form of a string of boundaries
interspersed with segmental material. For ease of reference, I shall
number boundaries with subscripts 0,1,2 ... working from left to
right in an utterance. Since, for much of the time, we shall be
dealing with relative values of the features [Π], [Ψ], [Pause], rather
than with the absolute values, I shall use Greek letters α, ξ, π
respectively, to symbolise their coefficients. In addition, the
Greek letters will have subscripts identical to those used for the
boundaries to which they belong. We will therefore have representa-
tions of the form [33].

[33]
$$\begin{vmatrix} \alpha_0 \Pi \\ \xi_0 \ \Psi \\ \pi_0 \ \text{Pause} \end{vmatrix}_0 \quad \cdots \quad \begin{vmatrix} \alpha_1 \ \Pi \\ \xi_1 \ \Psi \\ \pi_1 \ \text{Pause} \end{vmatrix}_1 \quad \cdots \quad \begin{vmatrix} \alpha_2 \ \Pi \\ \xi_2 \ \Psi \\ \pi_2 \ \text{Pause} \end{vmatrix} \quad \cdots \quad \begin{vmatrix} \alpha_n \ \Pi \\ \xi_n \ \Psi \\ \pi_n \ \text{Pause} \end{vmatrix}_n$$

Having specified the main formal characteristics of phonological
structure, we now move on to consider on what basis particular
phonological structures are posited, in other words, the ways in which
phonological structure, together with a particular set of rules, may
be used to account for various intonational phenomena.

3.2   First, pauses. Distribution of pause lengths at Π-boundaries in ten
French texts I have studied is as shown in [34]. (This excludes pauses
at boundaries directly preceding a [3Π] boundary, which are a rather
special case).

[34]

258

154

88

56

31   25   42   23   30   19   13   7   6

0   200   400   600   800   1000 1200 1400 1600 1800 2000 2200   2400 >2400ms
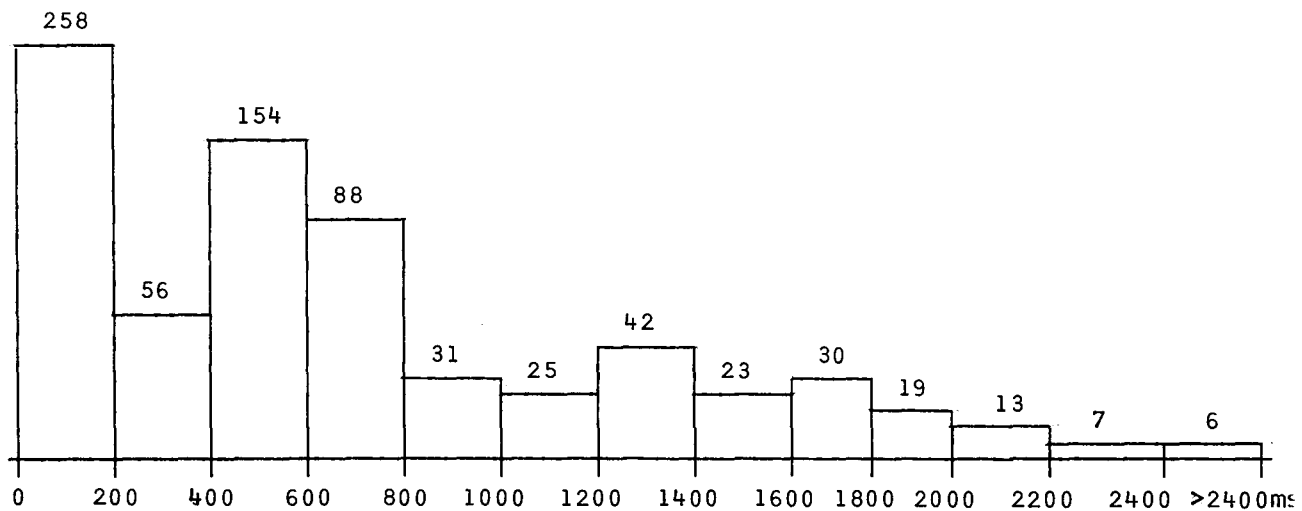
Of particular note is the trough in the histogram between 200ms and 400ms. More detailed analysis shows that of the 56 instances of pauses of duration $\geq$ 200ms and < 400ms, 37 come in the range [200,300)ms and only 19 in the range [300,400)ms. This highly non-normal distribution must be accounted for in some way, and it seems reasonable to suppose that the intonation system of the language makes a distinction between two types of boundary, one typically occurring with a pause of duration <300ms, and one typically occurring with a pause of duration $\geq$400ms. Out of a total of 752 boundaries, only 19 (about 2.5 per cent) are not unambiguously classifiable in this way. (Obviously, the absolute values of these typical pause lengths will vary from speaker to speaker and text to text. This is of no consequence for our purposes, as long as the hypothesized distinction is maintained in some form).

Among the longer pauses (duration $\geq$ 400ms), the histogram of [34] seems to provide little evidence for further systematic distinctions. However, when we consider this distribution in the light of the different types of nuclear tone that may occur before boundaries, we find that for the 211 boundaries preceded by a falling tone, there is a mean pause length of 1400ms, while for the 227 boundaries preceded by a rising or high static tone, there is a mean pause length of 600ms. This seems to provide firm justification for positing a further distinction of boundary types within the second category posited earlier: one type associated with non-falling nuclear tones and pauses of around 600ms duration, another type associated with falling nuclear tones and pauses of around 1400ms duration. (As before, the absolute values of the pause durations may be expected to vary from text to text and speaker to speaker).

We therefore have evidence for an underlying three-way classification of boundaries, which we can represent by the means already described, namely the feature [Π]. The three boundary types in question are associated with three distinct lengths of pause, which we can represent, from shortest to longest, as [0 Pause], [2 Pause], [4 Pause]. The following rule is all that is needed to account for these facts.

[35] $[\beta\Pi] \rightarrow [2(\beta-1)\text{Pause}]$

Now consider the following examples; pause durations in ms have been indicated in brackets beneath the relevant boundary symbol.

[36]

(a) $\bar{\bar{\Pi}}_0$ Les maquis $\bar{\Pi}_1$ constitués par les réfractaires du STO $\bar{\Pi}_2$
[660]   [400]

Service Π_3 du Travail Obligatoire $\bar{\Pi}_4$ naquirent Π_5 vers 1942 $\bar{\bar{\Pi}}_6$
[0]   [600]   [0]

"The maquis, made up of those who had refused to cooperate with the Compulsory Work Service (STO), came into existence around 1942."

(b) $\bar{\bar{\Pi}}_0$ Si le Gouvernement $\bar{\Pi}_1$ engage lui-même Π_2 sa responsabilité
[360]   [0]

sur son programme $\bar{\Pi}_3$ si le Gouvernement Π_4 engage lui-même Π_5
[1980]   [120]   [0]

son existence Π_6 sur un projet de loi $\bar{\Pi}_7$ si l'Assemblée
[0]   [2220]

nationale $\bar{\Pi}_8$ introduit Π_9 une motion de censure $\bar{\bar{\Pi}}_{10}$
[420]   [0]

"If the Government itself stakes its responsibility on its legislative programme; if the Government itself stakes its existence on a particular bill; if the National Assembly tables a vote of no confidence."

(c) $\bar{\bar{\Pi}}_0$ Elle trouve que les primitifs Π_1 sont en général de bons
[0]

parents $\bar{\Pi}_2$ ils réussissent Π_3 à apprendre à leurs enfants à
[800]   [0]

être courageux $\bar{\Pi}_4$ à affronter les difficultés de la vie $\bar{\Pi}_5$
[820]   [440]

sans les battre $\bar{\Pi}_6$ sans être brutaux avec eux $\bar{\bar{\Pi}}_7$
[400]

"She finds that members of primitive societies in general make good parents; they successfully teach their children to show courage, and face up to life's difficulties, without beating or brutalising them."

Notice that there are considerable contrasts in the length of pause associated with the $[2\Pi]$-boundaries, particularly noticeable in [36b], where the pauses are of a duration normally associated with $[3\Pi]$ boundaries, but also in [36a,c]. These differences seem to be sufficiently large in magnitude, and sufficiently systematic in their

occurrence not to be due merely to the random variations one assumes to be operative in the production of specific pause tokens. In other words, it seems justifiable to take such differences as evidence for a fourth type of pause distinction. We may thus transcribe [36a-c] as [37a-c] respectively.

[37]

(a) $\left|\begin{array}{l}3\pi\\4\text{ Pause}\end{array}\right|_0 \cdots \left|\begin{array}{l}2\pi\\3\text{ Pause}\end{array}\right|_1 \cdots \left|\begin{array}{l}2\pi\\2\text{ Pause}\end{array}\right|_2 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_3 \cdots \left|\begin{array}{l}2\pi\\3\text{ Pause}\end{array}\right|_4 \cdots$

$\cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_5 \cdots \left|\begin{array}{l}3\pi\\4\text{ Pause}\end{array}\right|_6$

(b) $\left|\begin{array}{l}3\pi\\4\text{ Pause}\end{array}\right|_0 \cdots \left|\begin{array}{l}2\pi\\2\text{ Pause}\end{array}\right|_1 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_2 \cdots \left|\begin{array}{l}2\pi\\3\text{ Pause}\end{array}\right|_3 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_4 \cdots$

$\cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_5 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_6 \cdots \left|\begin{array}{l}2\pi\\3\text{ Pause}\end{array}\right|_7 \cdots \left|\begin{array}{l}2\pi\\2\text{ Pause}\end{array}\right|_8 \cdots$

$\cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_9 \cdots \left|\begin{array}{l}3\pi\\4\text{ Pause}\end{array}\right|_{10}$

(c) $\left|\begin{array}{l}3\pi\\4\text{ Pause}\end{array}\right|_0 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_1 \cdots \left|\begin{array}{l}2\pi\\3\text{ Pause}\end{array}\right|_2 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\end{array}\right|_3 \cdots \left|\begin{array}{l}2\pi\\3\text{ Pause}\end{array}\right|_4 \cdot$

$\cdots \left|\begin{array}{l}2\pi\\2\text{ Pause}\end{array}\right|_5 \cdots \left|\begin{array}{l}2\pi\\2\text{ Pause}\end{array}\right|_6 \cdots \left|\begin{array}{l}3\pi\\4\text{ Pause}\end{array}\right|_7$

In order to account for these phenomena, I shall assume that the boundaries in question have contrasting specifications for a feature that I shall call [Ψ], with longer pauses correlating with higher valued coefficients of [Ψ]. Assuming, also, not unnaturally, that Π̄-boundaries are stronger than Π̄-boundaries, which are in turn stronger than Π-boundaries, in terms of this feature, we can transcribe [37a] as [38a]. (The other examples can be dealt with in similar fashion).

[38]

(a) $\left|\begin{array}{l}3\pi\\4\text{ Pause}\\0\Psi\end{array}\right|_0 \cdots \left|\begin{array}{l}2\pi\\3\text{ Pause}\\-1\Psi\end{array}\right|_1 \cdots \left|\begin{array}{l}2\pi\\2\text{ Pause}\\-2\Psi\end{array}\right|_2 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\\3\ \Psi\end{array}\right|_3 \cdots$

$\left|\begin{array}{l}2\pi\\3\text{ Pause}\\-1\Psi\end{array}\right|_4 \cdots \left|\begin{array}{l}1\pi\\0\text{ Pause}\\-2\Psi\end{array}\right|_5 \cdots \left|\begin{array}{l}3\pi\\4\text{ Pause}\\0\Psi\end{array}\right|_6$

[39]

$$W \left|\begin{array}{c}2\pi\\ <\xi\Psi\end{array}\right| X \left|\begin{array}{c}2\pi\\ \xi\Psi\end{array}\right| Y$$

$$\downarrow$$

[3 Pause]

condition:

$$X \neq Z_1 \ [>\xi\Psi] \ Z_2$$

Next, consider the examples of [40];   the symbol P beneath a pause of duration >100ms marks the presence of a perceptible pause;   the symbol $\not{P}$ marks the absence of a perceptible pause;   (P) is used in cases where it is unclear auditorily whether a pause is present or not.

[40]

(a) $\overline{\overline{\Pi}}_0$ Chaque département Π_1 doit comprendre au moins deux
                         [0]
        districtes électoraux $\overline{\Pi}_2$ ce sy↓ˇstème Π_3 de délimita↓ˊtion
                              [600]   [0]
                                                                 $\not{P}$
        Π_4 avantage les petits départements agricols $\overline{\overline{\Pi}}_5$
     [120]
      P

        "Each department must comprise at least two constituencies;
         this system of electoral division works to the advantage
         of the small agricultural departments."

(b) $\overline{\overline{\Pi}}_0$ Une investiga↓ˊtion Π_1 ↓ˇfaite Π_2 auprès de 2500 Anglais $\overline{\Pi}_3$ ...
                        [<100]   [0]   [660]
                          P
        "An investigation carried out among 2500 British people ..."

(c) $\overline{\overline{\Pi}}_0$ A ce su↑-jet Π_1 il faut remarquer que les ↑ˇrègles Π_2
                    [100]   [0]
                                                                        $\not{P}$
        fixant la composition des collèges sénatoriaux $\overline{\Pi}_3$ ...
                                                             [540]

        "It should be noted in this connection that the rules
         determining the composition of the electoral colleges
         for the Senate ..."

(d) $\overline{\overline{\Pi}}_0$ Il exi↑ˊstait Π_1 une minori↑té Π_2 europé↑-enne Π_3 importante $\overline{\Pi}_4$ ...
                    [100]   [0]   [0]   [640]
                    (P) $\not{P}$ $\not{P}$
        "There existed a sizeable European minority ..."

Examination of the pauses occurring at the [1π]-boundaries in these examples shows that further systematic distinctions are made in the range [0,300)ms, distinctions of pause duration that regularly coincide with an auditory contrast between presence or absence of a perceptible pause. As before, it is reasonable to assume that these surface contrasts reflect an underlying distinction between different strengths of boundary, so that [40a,b], for example, may be represented as in [41a,b].

[41]

(a)
$$\begin{vmatrix} 3\pi \\ 4 \text{ Pause} \\ 0\Psi \end{vmatrix}_0 \quad ... \quad \begin{vmatrix} 1\pi \\ 1 \text{ Pause} \\ -2\Psi \end{vmatrix}_1 \quad ... \quad \begin{vmatrix} 2\pi \\ 2 \text{ Pause} \\ -1\Psi \end{vmatrix}_2 \quad ... \quad \begin{vmatrix} 1\pi \\ 0 \text{ Pause} \\ -3\Psi \end{vmatrix}_3 \quad ...$$

$$\begin{vmatrix} 1\pi \\ 1 \text{ Pause} \\ -2\Psi \end{vmatrix}_4 \quad ... \quad \begin{vmatrix} 3\pi \\ 4 \text{ Pause} \\ 0\Psi \end{vmatrix}_5$$

(b)
$$\begin{vmatrix} 3\pi \\ 4 \text{ Pause} \\ 0\Psi \end{vmatrix}_0 \quad ... \quad \begin{vmatrix} 1\pi \\ 1 \text{ Pause} \\ -2\Psi \end{vmatrix}_1 \quad ... \quad \begin{vmatrix} 1\pi \\ 0 \text{ Pause} \\ -3\Psi \end{vmatrix}_2 \quad ... \quad \begin{vmatrix} 2\pi \\ 2 \text{ Pause} \\ -1\Psi \end{vmatrix}_3 \quad ...$$

We can account for such examples by a simple generalisation of [39]:

[42]

$$W \quad \begin{vmatrix} \alpha\pi \\ <\xi\Psi \end{vmatrix} \quad X \quad \begin{vmatrix} \alpha\pi \\ \xi\Psi \\ \pi \text{ Pause} \end{vmatrix} \quad Y$$

$$\downarrow$$

$$[(\pi+1) \\ \text{Pause}]$$

Conditions: (i) $X \neq Z_1 \ [>\xi\Psi] \ Z_2$

 (ii) $\alpha \ \epsilon \ \{1,2\}$

3.3   The second type of intonational phenomenon that can satisfactorily be dealt with on the basis of assumptions concerning the phonological structure of utterances is nuclear tones. In §2.3, we presented a rule ([5]) that would generate any of nine different nuclear tones on the last accented syllable before a π-boundary. Not surprisingly, this rule proves to be far too general when we consider the distribution of nuclear tones relative to [3π]-, [2π]-, and [1π]-boundaries, and it is the purpose of this subsection to effect a more precise statement.

The principal distributional characteristics of the most important nuclear types in French are as follows: (1) "final" falling tone (high fall: ↑˅; or low fall: ↓˅). This occurs exclusively before [3π]-boundaries (and was, in fact, used as a criterial difference

for the identification of [3π]- and [2π]-boundaries - cf above §3.2).
(2) Low static tone (↓-) or "non-final" high or low falling tone.
These occur exclusively before [1π]-boundaries. (3) Rising tones
(high rise: ↑⁻ ; low rise: ↓⁻) and high static tone (↑-). These
occur before [1π]- and [2π]-boundaries. At the phonetic level, the
distinction between "final" and "non-final" falling tones is carried
by both fundamental frequency and amplitude contours. The F_0 of
"final" falls typically descends to the very bottom of a speaker's
range (around 80Hz for males), whereas "non-final" falls typically
end somewhat higher (maybe around 120Hz).

As regards amplitude contours, "final" falls, particularly low falls,
are associated with a marked reduction in amplitude, which is not
observed to anything like the same extent in "non-final" falls. The
two types are thus readily distinguishable phonetically; I shall,
however, not attempt to represent the distinction phonologically,
since to do so is not crucial to the discussion. One complicating
factor perhaps worthy of mention is that in French, many utterances
that one might expect to end in a "final" falling tone in fact end
with a low static tone. Although I have no instrumental evidence to
support this claim, it seems likely that similar factors may be
involved in distinguishing "final" from "non-final" low static tones
to those found with falling tones. I shall not pursue this point
further here, however.

On this basis, we can write our first replacement for rule [5].

[43]   W [-A] [+A][-A]$_0$ [3π]
$$\left| \begin{matrix} \alpha R \\ \beta F \end{matrix} \right. \left| \begin{matrix} +F \end{matrix} \right| \rightarrow$$

Now consider again examples [40a-d]. We have already seen that the
differences in pause duration found here can be accounted for on the
assumption of differences of boundary strength in phonological
structure. But notice also that the boundaries we have assumed to be
weaker on the grounds that they coincide with a shorter (or zero)
pause in addition are preceded by falling or low static tones. The
obvious conclusion to draw from this is that falling or low static
tones before [1π]-boundaries function as additional cues to the form
of the phonological structure of an utterance, and serve to signal
weaker boundaries.

This justifies the following rule:

[44]   W [-A]$_0$ [+A][-A]$_0$ $\left| \begin{matrix} 1\pi \\ <\xi\Psi \end{matrix} \right|$ X [ξΨ] Y
$$\left\{ \left| \begin{matrix} +F & \left| \begin{matrix} -R & -R \\ -F & -F \\ +F & +F \end{matrix} \right| \end{matrix} \right| \right\}$$

Condition: X ≠ Z$_1$ [>ξΨ] Z$_2$

Finally, the remainder of cases of [1П]-boundaries, and all [2П]-boundaries are preceded by rising (generally high rising) or high static tones. We may thus write [45] as the final replacement for rule [5].

[45]   W [-A]$_0$ [+A] [-A]$_0$ [αП]
$$\begin{vmatrix} \delta R \\ \beta F \end{vmatrix} \begin{vmatrix} \gamma R \\ -F \end{vmatrix} \begin{vmatrix} \gamma R \\ -F \end{vmatrix}$$ →

        Conditions: (i)   α ε {1,2}
                      (ii) if δ = -, then γ = +

3.4   A third aspect of intonational patterning that relates to phonological structure has to do with what I shall call the *head* of a phonological phrase. By this, I mean simply the first or, occasionally, the second accented syllable. The conditions under which the head is taken to be the second rather than the first accent are (i) that the second accent is on the same or a higher pitch/F_0 level than the first, and (ii) that the two accents should be in the same phonological word.

If we consider the relative levels of the heads of successive phonological phrases, we find that the canonical pattern is of the following form:

[46]   П ...   ... П ...   ... П ...   ... П

This type of pattern is illustrated in [47], where heads are underlined and their fundamental frequency level in Hz given beneath.

[47] $\bar{\bar{П}}_0$ A <u>cause</u> de l'évolution technologique $\bar{П}_1$ le <u>prolétariat</u>
            340   290

        traditionnel $П_2$ a <u>moins</u> d'influence $П_3$ sur les <u>secteurs</u>
                            280   215

        essentiels de la production $\bar{\bar{П}}_4$

        ("As a result of technological evolution, the proletariat
         in the traditional sense has less influence on the most
         important manufacturing sectors.")

In order to generate patterns such as this, we need to refer to the pitch/F_0 level of individual syllables. A natural way to do this is by means of the scalar feature [f], which, at the level of representation we are dealing with, may be considered to be specified for individual syllables, in particular, for individual accented syllables. Using the Greek letter σ as a variable over the scalar coefficients of [f], we may take the specification [σ_if] to refer to the level of the head of the phonological phrase preceded by the boundary $П_i$. That is, we will have representations of the following form:

        [α_0П] ... [σ_0f] ... [α_1П] ... [σ_1f] ... [α_2П] ... [σ_2f] ...

The justification for this notation is that, as we shall see, the height of the head of a phonological phrase can provide cues to the nature of the preceding (not following) boundary.

To generate the pattern diagrammed in [46], the following very simple rule is all we need, given the notation just described.

[48] $[\sigma_i f] \rightarrow [<\sigma_{i-1} f]$

Now the main interest of heads of phonological phrases lies in those cases which do not conform to the canonical pattern generated by [48]. In the following examples boundaries are represented as feature complexes, the specifications of the feature [Ψ] being inferred initially from pause lengths where relevant, nuclear tones. Heads are underlined, with their F_0 value in Hz beneath.

[49]   (a)
$\begin{vmatrix} 3\Pi \\ 4P \\ 0\Psi \end{vmatrix}_0$ A $\underline{\text{Forcal}}$quier $\begin{vmatrix} 1\Pi \\ 0P \\ -2\Psi \end{vmatrix}_1$ en $\underline{\text{Haute}}$ Provence $\begin{vmatrix} 2\Pi \\ 2P \\ -1\Psi \end{vmatrix}_2$

$\quad\quad$ 225 $\quad\quad$ 160

$\quad\quad \sigma_0 \quad\quad\quad\quad\quad \sigma_1$

la journa$\underline{\text{liste}}$ s'est étonnée des réponses diverses $\begin{vmatrix} 1\Pi \\ 0P \\ 2\Psi \end{vmatrix}_3$ qu'elle

$\quad$ 220

$\quad \sigma_2$

a re$\underline{\text{çues}}$ à une question très simple $\begin{vmatrix} 3\Pi \\ 4P \\ 0\Psi \end{vmatrix}_4$

$\quad$ 150

$\quad \sigma_3$

("In Forcalquier, in Haute Provence, the journalist was surprised at the variety of answers she got to one very simple question.")

(b)
$\begin{vmatrix} 3\Pi \\ 4P \\ 0\Psi \end{vmatrix}_0$ Une $\underline{\text{autre}}$ différence $\begin{vmatrix} 1\Pi \\ 0P \\ -2\Psi \end{vmatrix}_1$ entre les $\underline{\text{sociétés}}$

$\quad\quad$ >210 $\quad\quad\quad\quad\quad\quad\quad$ 135

$\quad\quad \sigma_0 \quad\quad\quad\quad\quad\quad\quad\quad \sigma_1$

primitives et la nôtre $\begin{vmatrix} 2\Pi \\ 2P \\ -1\Psi \end{vmatrix}_2$ c'est que $\underline{\text{très}}$ souvent chez nous

$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$ >210

$\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad \sigma_2$

$\begin{vmatrix} 1\Pi \\ 0P \\ -2\Psi \end{vmatrix}_3$ la fa$\underline{\text{mille}}$ ne se compose que des parents $\begin{vmatrix} 1\Pi \\ 0P \\ -2\Psi \end{vmatrix}_4$

$\quad\quad\quad\quad$ 160

$\quad\quad\quad\quad \sigma_3$

et des enfants $\begin{vmatrix} 3\Pi \\ 4P \\ 0\Psi \end{vmatrix}_5$

("Another difference between primitive societies and ours is that in ours, the family very frequently consists of only the parents and the children.")

Notice that in both of these cases, there is a break in the regular descending pattern across heads, namely at σ_2 in [49a] and σ_2 in [49b]. Notice further that in both cases the boundary before this break is a [2Π]-boundary, which is preceded by a [1Π]-boundary. This means that if these two examples are at all representative – and they are – we may modify our statement of the canonical pattern for heads by saying that it involves a gradual descent (i) over the utterance as a whole, ie over an entire phonological sentence, and (ii) over individual phonological clauses. (Recall that [3Π]-, [2Π]- and [1Π]-boundaries represent phonological sentence, clause, and phrase boundaries, respectively). We may thus replace [46] by [50].

[50]

$$\overline{\overline{\Pi}} \ldots \quad \ldots \Pi \ldots \quad \ldots \overline{\Pi} \ldots \quad \ldots \Pi \ldots \quad \ldots \Pi \ldots \quad \ldots \overline{\Pi} \ldots \quad \ldots \Pi \ldots \quad \ldots \overline{\overline{\Pi}}$$

The rule we need to generate patterns of this form (in conjunction with rule [48]) is the following:

[51]

$$W \ [1\Pi]_i \ X_1 \ [\sigma_i f] \ X_2 \ [2\Pi]_{i+1} \ X_3 \ [\sigma_{i+1} f] \ Y$$

$$\downarrow$$

$$[\geq \sigma_i f]$$

Next, consider the following examples:

[52]   (a)

$\left|\begin{matrix} 3\Pi \\ 4P \\ 0\Psi \end{matrix}\right|_0$ A cet égard $\left|\begin{matrix} 2\Pi \\ 2P \\ -2\Psi \end{matrix}\right|_1$ les réseaux de la zone sud

$\qquad\qquad\qquad\qquad \underline{230} \qquad\qquad\qquad\qquad \underline{210}$

$\qquad\qquad\qquad\qquad \sigma_0 \qquad\qquad\qquad\qquad\qquad \sigma_1$

$\left|\begin{matrix} 2\Pi \\ 2P \\ -2\Psi \end{matrix}\right|_2$ furent plus politisés $\left|\begin{matrix} 1\Pi \\ 0P \\ -3\Psi \end{matrix}\right|_3$ que ceux de la zone nord

$\qquad\qquad \underline{185} \qquad\qquad\qquad\qquad\qquad\qquad \underline{170}$

$\qquad\qquad \sigma_2 \qquad\qquad\qquad\qquad\qquad\qquad\qquad \sigma_3$

$\left|\begin{matrix} 2\Pi \\ 2P \\ -2\Psi \end{matrix}\right|_4$ car ils luᵗ ttèrent $\left|\begin{matrix} 1\Pi \\ 0P \\ -3\Psi \end{matrix}\right|_5$ jusqu'en 1942 $\left|\begin{matrix} 2\Pi \\ 3P \\ -1\Psi \end{matrix}\right|_6$

$\qquad\qquad\qquad \underline{180} \qquad\qquad\qquad\qquad 235$

$\qquad\qquad\qquad \sigma_4 \qquad\qquad\qquad\qquad \sigma_5$

plus contre la collaboration du régime de Vichy $\left|\begin{matrix} 2\Pi \\ 2P \\ -2\Psi \end{matrix}\right|_7$

$\underline{250}$

σ_6

que contre l'envahisseur allemand $\left|\begin{matrix} 3\Pi \\ 4P \\ 0 \end{matrix}\right|_8$

$\quad \underline{160}$

$\quad \sigma_7$

("In this respect, the resistance cells in the southern zone were
more politicised than those in the north, for they continued
fighting up until 1942 more against the collaboration of the
Vichy government than against the German invaders.")

(b) $\begin{vmatrix} 3\Pi \\ 4P \\ 0\Psi \end{vmatrix}_0$ Se le scénario exigeait un medecin $\begin{vmatrix} 2\Pi \\ 2P \\ -2\Psi \end{vmatrix}_1$ un ouvrier

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\overline{160}\qquad\qquad\qquad\qquad\qquad\qquad\qquad\overline{155}$

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad\sigma_0\qquad\qquad\qquad\qquad\qquad\qquad\qquad\quad\sigma_1$

$\begin{vmatrix} 2\Pi \\ 3P \\ -1\Psi \end{vmatrix}_2$ c'était un vrai médecin $\begin{vmatrix} 2\Pi \\ 2P \\ -2\Psi \end{vmatrix}_3$ un vrai ouvrier

$\qquad\qquad\qquad\qquad\qquad\qquad\overline{215}\qquad\qquad\qquad\qquad\qquad\qquad\overline{200}$

$\qquad\qquad\qquad\qquad\qquad\quad\sigma_2\qquad\qquad\qquad\qquad\qquad\qquad\quad\sigma_3$

$\begin{vmatrix} 1\Pi \\ 0P \\ -3\Psi \end{vmatrix}_4$ qu'il fallait trouver $\begin{vmatrix} 3\Pi \\ 4P \\ 0\Psi \end{vmatrix}_5$

("If the scene required a doctor or a workman, it was a
real doctor or a real workman that had to be found.")

Again, we find breaks in the descending pattern over heads, namely at
σ_6 in [52a] and at σ_2 in [52b]. (The break at σ_5 in [52a] is due to
another process, which need not concern us here.) Both of these follow
[2Π]-boundaries, but [2Π]-boundaries with extra long pauses (both are
specified [3P]), which we have taken to be a cue for a higher valued
coefficient of the feature [ ]. We may therefore say that the height
of heads not only serves to signal the relative weakness of [1Π]-
boundaries compared with [2Π]-boundaries, but also acts as a cue for
differences of strength among [2Π]-boundaries. This motivates the
generalisation of [51] to [53].

[53] $W\ [<\xi_i\psi]\ X_1\ \begin{vmatrix} 2\Pi \\ \xi_j\Psi \end{vmatrix}\ X_2\ [\sigma_j f]\ Y$

$\qquad\qquad\qquad\qquad\downarrow$

$\qquad\qquad\qquad[\geq\sigma_i f]$

Conditions: (i) $X_1 \neq Z_1\ [\geq\xi_j\Psi]\ Z_2$

$\qquad\qquad$ (ii) $\xi_i < \xi_j$

3.5   The fourth, and final, type of pattern I shall consider that can
      satisfactorily be accounted for on the basis of specific assumptions
      concerning the phonological structure of utterances involves the end-
      points of nuclear glides. Here, as with heads, the canonical pattern
      is one of a gradual descent from one end-point to the next, as
      diagrammed in [54].

[54] Π ...   Π ...   Π ...   Π ...

This is illustrated in the following example:

[55] $\overline{\overline{\Pi}}_0$ D'autre ↑'<u>part</u> $\overline{\Pi}_1$ s'il y a conflit entre l'Assemblée
                                   150-
                                   210

   nationale et le Sé↑'<u>nat</u> Π_2 la Constitution ne permet pas à
                        125-
                        170

   l'Assem↑'<u>blée</u> Π_3 de prendre l'avan↑'<u>tage</u> Π_4 sur le Sénat $\overline{\overline{\Pi}}_5$
              125-   100-
              135   130

   ("On the other hand, if there is disagreement between the
    National Assembly and the Senate the Constitution does not
    allow the Assembly to over-rule the Senate.")

As before, we shall need to make use of the feature [f] in order to
describe these phenomena. I shall use the Greek letter η as a
variable over coefficients of [f] for the end-points of nuclear glides,
with subscripts matching the subscripts on following boundaries. This
gives strings of the form

   $[\alpha_0 \Pi]$ ... $[\eta_1 f][\alpha_1 \Pi]$ ... $[\eta_2 f][\alpha_2 \Pi]$ ...

The rule needed to generate the pattern diagrammed in [54] is [56].

[56] $[\eta_i f] \rightarrow [<\eta_{i-1} f]$

Now consider the following examples:

[57] (a) $\overline{\overline{\Pi}}_0$ Les ma↑'<u>rins</u> Π_1 s'adaptent plus facile↑'<u>ment</u> Π_2 que les
                        170   155
                        η_1 η_2

        agricul↑'<u>teurs</u> $\overline{\Pi}_3$ aux circonstances nouvelles $\overline{\overline{\Pi}}_4$
                165
                η_3

        ("Sea-farers adapt more easily than peasants to new situations.")

   (b) $\overline{\overline{\Pi}}_0$ Ces ingen↑'<u>ieurs</u> Π_1 ces techni↑'<u>ciens</u> Π_2 et ces spécia↑'<u>listes</u>
                     310   235   285
                     η_1 η_2 η_3

        $\overline{\Pi}_3$ '<u>forment</u> Π_4 avec les étu↑-<u>diants</u> Π_5 comme futurs spécia↑'<u>listes</u>
                280   170   280
                η_4 η_5 η_6

        $\overline{\Pi}_6$ une nouvelle classe $\overline{\overline{\Pi}}_7$

        ("These engineers, technicians, and specialists, form, together
         with the students as future specialists, a new class.")

Notice that the descending pattern over nuclear end-points is broken at η_3 in [57a], and at η_3 and η_6 in [57b]. We see immediately, that the boundaries following these end-points are [2Π]-boundaries that are preceded by a sequence of one or more [1Π]-boundaries, so that the situation here is very similar to the one we encountered with heads in the previous sub-section. We may write rule [58] to account for these patterns.

[58]   W $[\eta_i f] [1\Pi]$ X $[\eta_{i+1} f] [2\Pi]$ Y

$$\downarrow$$

$$[\geq \eta_i f]$$

Next, consider the examples of [59]:

[59]   (a) $\begin{vmatrix} 3\Pi \\ 4P \\ 0\psi \end{vmatrix}_0$ Le $\underline{\text{Parlement}}$ français $\begin{vmatrix} 2\Pi \\ 2P \\ -2\psi \end{vmatrix}_1$ se $\underline{\text{préoccupait}}$ $\begin{vmatrix} 1\Pi \\ 0P \\ -3\psi \end{vmatrix}_2$

              $\geq$210   165   160   145

           σ_0 η_1 σ_1 η_2

       $\underline{\text{sans}}$ y parve$\underline{\text{nir}}$ $\begin{vmatrix} 2\Pi \\ 2P \\ -1\psi \end{vmatrix}_3$ de $\underline{\text{mettre}}$ fin à cette $\underline{\text{guerre}}$ $\begin{vmatrix} 2\Pi \\ 2P \\ -2\psi \end{vmatrix}_4$

       145   155   200   140

        σ_2 η_3 σ_3 η_4

       $\underline{\text{ruineuse}}$ pour la $\underline{\text{France}}$ $\begin{vmatrix} 2\Pi \\ 2P \\ -1\psi \end{vmatrix}_5$ et $\underline{\text{qui}}$ la mettait en position

       190   170   190

        σ_4 η_5 σ_5

       d'accu$\underline{\text{sée}}$ $\begin{vmatrix} 1\Pi \\ 0P \\ -2\psi \end{vmatrix}_6$ à l'O$\underline{\text{NV}}$ $\begin{vmatrix} 3\Pi \\ 4P \\ 0\psi \end{vmatrix}_7$

            160   150

           η_6 σ_6

       ("The French Parliament was unsuccessfully concerned to put a stop to this war which was ruinous for France and led to accusations being made against her at the UN.")

     (b) $\begin{vmatrix} 3\Pi \\ 4P \\ 0\psi \end{vmatrix}_0$ repro$\underline{\text{chant}}$ $\begin{vmatrix} 1\Pi \\ 0P \\ -3\psi \end{vmatrix}_1$ à la $\underline{\text{France}}$ $\begin{vmatrix} 2\Pi \\ 2P \\ -2\psi \end{vmatrix}_2$

                   190   170

                $\sigma_0 \equiv \eta_1$ $\sigma_1 \equiv \eta_2$

       de laisser $\underline{\text{gouverner}}$ l'Al$\underline{\text{gérie}}$ $\begin{vmatrix} 2\Pi \\ 2P \\ -2\psi \end{vmatrix}_3$ par un $\underline{\text{groupe}}$ de $\underline{\text{colons}}$

                175   150   140   175

           σ_2 η_3 σ_3 η_4

     $\begin{vmatrix} 2\Pi \\ 3P \\ -1\psi \end{vmatrix}_4$ et ré$\underline{\text{clamant}}$ le fédéralisme $\begin{vmatrix} 3\Pi \\ 4P \\ 0\psi \end{vmatrix}_5$

                     180

                  σ_4

     ("Criticising France for allowing Algeria to be governed by a set of colonials, and demanding federal status.")

Here, too, we find breaks in the descending pattern, namely at η_3 and η_5 in [59a] and at η_4 in [59b]. But notice that the boundaries following these breaks are all [2Π]-boundaries that are stronger, in terms of the feature [ψ], than the preceding [2Π]-boundary. (Evidence for this claim is provided by the pattern over the relevant heads in [59a], and by both this and pause lengths in [59b]). We may therefore say that a raised nuclear end-point, like a raised head, acts as a cue for differences in strength among [2Π]-boundaries, as well as between [2Π]- and [1Π]-boundaries. This motivates rule [60].

[60]
$$ W\ [\xi_i, \Psi]\ X\ [\eta_j, f\ ]\ \left|\begin{array}{c} 2\Pi \\ \xi_j \end{array}\ \Psi\right|\ Y $$

$$ \downarrow $$

$$ [\geq \eta_i, f] $$

Conditions: (i) $X \neq Z_1\ [\geq \xi_i, \Psi]\ Z_2$

(ii) $\xi_i < \xi_j$

3.6 Summarising the results of this section, we began by introducing the notion of phonological structure, as a level of representation which is posited in order to help provide an explanation for various intonational phenomena. We then discussed some of these phenomena, namely those relating to pauses, nuclear tones, heads of phonological phrases, and nuclear end-points, and saw that given a certain set of rules it was possible to account for the patterns found in the data by making specific assumptions about the phonological structure of the utterances in question. Turning the argument round, we may say that the four types of intonational patterning we have examined provide evidence for particular types of phonological structure. Having thus determined the phonological structure of an utterance, we are now in a position to examine the ways in which it corresponds to its syntactic structure, in other words, to determine the relation between intonation and syntax. This is our task in the following section.

4.1 This section will concentrate on providing the final link in the chain of rules leading from syntax to intonation. But before proceeding to deal with this in detail, I should like briefly to point out, for the sake of explicitness, a number of areas where one might expect to find links between intonation and syntax, but where I have been able to find none.

The first of these areas is accentuation. For convenience, I shall mark accented syllables by means of the symbol ' placed before them; the last accented syllable in a phonological phrase is, of course, the nucleus.

Familiar types of sentence such as that illustrated in [61], might
lead one to believe that the distribution of accents in an utterance
is determined syntactically.

[61]   'First 'Ferdinand 'frightened 'Freda, then Fe'licity frightened
        Freda.

The lack of accent on the second instances of *frightened* and *Freda*
might be put down to the fact that these items are repetitions of
earlier items, in surface structure. But other examples demonstrate
that exactly the same phenomenon of deaccentuation is found in cases
where semantic rather than syntactic factors must be considered
operative:

[62]   (a)   'First 'Ferdinand 'frightened 'Freda, then Fe'licity
               scared her.

        (b)   'Matthew 'doesn't be'lieve in 'God, and 'Mark 'too
               is an atheist.

Here, the deaccentuation of *scared* and *atheist* can, it seems to me,
only be accounted for on the basis of their near synonymy with
frighten and *not believe in God* respectively, a relation that can
presumably only be stated at the semantic level. Furthermore, not
only is syntactic surface structure not the only relevant level (if
it is relevant at all) for determining the distribution of accents,
but it also turns out that not all repetitions of items at this
level involve deaccentuation. This is shown by the examples of [63].

[63]   (a) (i)   A 'large pro'portion of 'Bachelors from 'this
                   Uni'versity re'main 'bachelors.

            (ii)   A 'large pro'portion of 'Bachelors from 'this
                   Uni'versity re'main Bachelors.

        (b)   The 'prince 'roared up to the 'castle 'gates in
                   his 'TR'7, but as 'soon as he 'turned into the
                   'drive, he 'turned into a 'pumpkin.

In all of these examples, we have repetition of lexical items (*bachelor*
and *turn*) in surface structure. We see, however, that mere repetition
is not sufficient to ensure deaccentuation, since in [63ai], where the
first instance of *bachelor* is in the academic sense, and the second is
in the marital sense, and also in [63b], where the two instances of
turn are different semantically, there is no deaccentuation. Only in
[63ai], where the two instances of *bachelor* mean the same do we find
that the second is deaccentuated. The obvious conclusion to draw
from this is that accentuation is governed semantically, and not
syntactically.

A second aspect of intonation that is often considered to be determined syntactically is the choice of nuclear tones. In particular, it is often supposed that "final" falling tones occur at the end of declaratives, imperatives, and information questions, while other tones occur elsewhere, namely in non-final positions in declaratives and in yes-no questions. But this is too naive an assumption. First, it is quite possible for "final" falls to occur in non-final positions, as in [64a]; second, not all declarative sentences end in "final" falls, as illustrated in [64b]. ("Final" falls are here marked by the symbol ↓˘ preceding a ∏̿ boundary.)

[64] (a) ∏̿ A ce sujet ∏ il faut remarquer que les_règles ∏ fixant la composition des collèges sénatoriau̱x ∏ datent ∏ de dix-huit cent quatre-vingt- ↓˘ quatre ∏ et avantagent ∏ par conséquent ∏ les petites communes rurales ∏ par rapport aux grands centres industriels ∏ et ur↓˘bains ∏̿.

   ("In this connection, it should be noted that the rules
      determining the composition of the electoral colleges
      for the Senate date from 1884, and consequently work
      to the advantage of the small rural communes relative
      to the large industrial and urban centres.")

   (b) ∏̿ Ils ne peuvent se présenter que dans un seul districte électo↓ˊral_∏ ils doivent enfin se présenter avec un remplaçant ∏ ...

   ("They may only stand in a single constituency; finally,
      they must arrange a substitute ...")

Second, it is well known that yes-no questions may end in falling as well as in rising tones. Third, it is by no means obvious that there is any syntactic difference between, for example, "He's coming" (statement) and "He's coming?" (question). Again, I conclude that semantic rather than syntactic factors are at work here.

A third area of intonation in which I have been unable to discover any evidence of syntactic conditioning concerns the patterns over bodies of phonological phrases generated by the rules of §2. A striking characteristic of our approach there was that the analysis it produced was entirely formal, and made no mention of the function of the patterns in question, either syntactically or, for that matter, semantically. Although it is quite unclear to me at present just what the functional correlates of the various patterns are, it does seem that the role of syntactic considerations is at best minimal.

In summary, we have considered three areas of intonation where the influence of syntactic factors is conspicuous by its absence. We may now move on to the only area where I have found clear links between intonation and syntax, namely the relation between syntactic surface structure and phonological structure.

4.2 In discussing the relation between syntactic surface structure and phonological structure, there are three questions I shall seek to answer. (1) What are the environments in which Π-boundaries may appear? (2) What are the environments in which Π-boundaries must appear? (3) What is the relation between syntactic and phonological constituent structure in environments where phonological phrase boundaries may or may not appear? I shall deal with these one by one, in the present and two following subsections respectively. One assumption, not so far made explicit, that should be mentioned at this point is that all phonological sentences, clauses, phrases and words are constituents of phonological structure. It should be clear from the discussion of the preceding section that this assumption is required for the correct operation of the rules that generate intonation patterns over sequences of phonological phrases. Since phonological constituency relations are expressed by means of the feature [ψ], the assumption amounts in formal terms to the requirement that in any string of the form [65a]

[65a] $\quad \dots \left| \begin{matrix} \alpha\Pi \\ \xi\psi \end{matrix} \right| X \left| \begin{matrix} \beta\Pi \\ \zeta\psi \end{matrix} \right| \dots$

where $\alpha, \beta \geq 0$, and $X \neq Z_1$ [$\gamma\Pi$] Z_2 with $\gamma \geq \alpha$ or $\gamma \geq \beta$, the following conditions hold:

[65b] (i) if $\alpha > \beta$, then $\xi > \zeta$

(ii) $\alpha < \beta$, then $\xi < \zeta$

If $\alpha = \beta$, the relation between ξ and ζ is not constrained.

Given this preliminary assumption, we now proceed to examine in what environments phonological phrase boundaries may occur. Notice, first of all, that in general, every phonological phrase must contain at least one accented syllable. (Possible exceptions to this involving phonological phrases in "tails" (the stretches after a nucleus) need not concern us here.) This means that unaccented items may not form complete phonological phrases on their own, whereas accented items may. In English, items that are normally unaccented include pronouns, articles, some auxiliary verbs, some prepositions, most conjunctions. Notice that these items are identifiable phonologically in that when not accented they have reduced vowels. On the other hand, nouns, full verbs, adjectives, and adverbs are usually accented, and are also identifiable phonologically in that they may not have all reduced vowels, even when unaccented. We may therefore say that phonological phrases will in general consist minimally of a lexical item (Noun, Verb, Adjective, Adverb) with zero or more non-lexical "clitics" (Pronouns, Auxiliaries, Prepositions, Articles, Complementisers, etc). Thus, for example, [65a] is quite normal, whereas any of [66b] is totally unacceptable, and the various versions of [66c] are acceptable only under special conditions of accentuation, if at all.

[66] (a) 　　　　　 ‖̄ The man‿Π and his wife Π were looking Π for the
　　　　　　　　　　 bathroom ‖

　　　 (b) (i)* ‖̄ The man and Π his wife Π were Π looking for the
　　　　　　　　　　　　　　　 [ŋ̩]　　　　　　　　　 [wə]

　　　　　　　　　 bathroom ‖̇

　　　　 (ii)* ‖̄ The Π man and his Π wife were looking for the Π
　　　　　　　　　 [ðə]　　　　　 [ɪz]　　　　　　　　　　　　　　　 [ðə]

　　　　　　　　　 bathroom ‖̄

　　　　 (iii)* ‖̄ The man‿and his wife were looking for Π the
　　　　　　　　　 bathroom ‖　　　　　　　　　　　　　　　　 [fə]

　　　 (c) (i) ‖̄ The man Π and Π his wife Π ...
　　　　　　　　　　 [ænd]

　　　　 (ii) ‖̄ The man Π and his Π wife　 ...
　　　　　　　　　 [hɪz]

　　　　 (iii) ‖̄ The man and his wife Π were Π looking for the bathroom ‖̄
　　　　　　　　　　　　　　 [wə·]

　　　　 (iv) ‖̄ The man and his wife were looking for Π the bathroom ‖̄
　　　　　　　　　　　　　　　　　　 [fɔ·]

The minimal phonological phrases exemplified in [66] I shall call
phonological words. In order to account for these observations, and
generate phonological words, we shall make use of the distinction
between so-called "major" and "minor" syntactic categories. The major
categories are the lexical categories N (Noun), V (Verb), A (Adjective/
Adverb), together with any categories such as NP (Noun Phrase), VP (Verb
Phrase), AP (Adjective/Adverb Phrase), PP (Prepositional Phrase), S
(Sentence), that dominate them. I shall refer to these collectively by
the symbol *L*. Minor categories are then Pronouns, Auxiliaries, Prepo-
sitions (those that cannot function as Adverbs), Articles, Complement-
isers, which will collectively be referred to by the symbol *M*. In
addition, I shall assume that all normally minor categories become
major categories when accented (as, for example, in [66c]). Phonological
words then consist of a single lexical (major) category together with
zero or more minor categories.

The only thing that remains to be decided is the direction in which
cliticisation of minor onto major categories takes place. That is,
given a string of the form *L M L*, do we get phonological words *LM + L*
or *L + ML*? The answer depends on the syntactic structure of the string
in question: [*L M*] *L* gives *LM + L* and *L* [*M L*] gives *L + ML*. Structures
of the form [*L M L*] generally give *LM + L*. Some examples follow; the
symbol [0Π] is used to mark a phonological word boundary (pwb).

[67]　(a)　Then [we bought [some chips]] →
　　　　　 Then [OΠ] we bought [OΠ] some chips

　　　 (b)　[You [and Fred]] [can stay [at home]] →
　　　　　 You [OΠ] and Fred [OΠ] can stay [OΠ] at home

　　　 (c)　He said [that the crooks [had offered him bribes]] →
　　　　　 He said [OΠ] that the crooks [OΠ] had offered him [OΠ] bribes

In summary, the first step in deriving a phonological structure from
a syntactic surface structure is to carry out a readjustment which
delimits phonological words. This has the effect of attaching non-
lexical, minor categories pro- or enclitically to adjacent lexical,
major categories. In formal terms, this means introducing [0]
boundaries at relevant points in the utterance. The rules needed to
do this are quite straightforward, and are given as [68a,b], with the
symbol [<OΠ] being used to indicate a boundary weaker than a phono-
logical word boundary.

[68]　(a)　W　　L　　([<ξΨ] M)$_0$　[ξΨ]　Y

　　　　　　1　　2　　　　3　4　　　5　6　　→
　　　　　　1　　2　　 [<OΠ] 4　　[OΠ]　6

　　　 (b)　W　　[ξΨ]　(M[<ξΨ])$_0$　L　Y

　　　　　　1　　2　　 3　4　　　 5　6　　　 →
　　　　　　1　　[OΠ] 3[<OΠ]　　 5　6

A final point to be noted in this connection is that rules [68a,b]
require that their input structures should take the form of strings
consisting of boundaries and lexical material. On the other hand,
it is usual to express syntactic structures in terms of labelled
bracketting. This means that we need a rule or rules that will some-
how transform representations in terms of labelled bracketting into
representations in terms of boundaries, while preserving constituency
relations. This presents no particular problems. A structure such
as [69a], for instance, must be mapped onto a string of the form [69b].

[69]　(a)

```
                                       ▽
                     ▽                              ▽
         ▽                    ▽           ▽    ▽           ▽
         |          ▽         ▽                        ▽   ▽
         |          ▽         |                        ▽   ▽
         A          B         C           D    E       F   G
```

　　　 (b)　[0ψ] A [-2ψ] B [-3ψ] C [-1ψ] D [-2ψ] E [-2ψ] F [-3ψ] G [0ψ]

It is not too difficult to write rules to do this, although I shall
not bother to do so here.

4.3   In this subsection, I shall briefly (and rather inconsequentially) discuss six cases where phonological phrase boundaries (ppb) seem to be obligatorily associated with certain syntactic configurations. The observations I shall make will not be particularly systematic, nor shall I attempt to express them formally. In addition to this, there will inevitably be some doubt about the validity of the data: ppb are not always easy to recognise when they occur, and particularly in rapid speech, the difference between two utterances which are identical in all respects other than in the presence vs absence of ppb can be extremely hard to detect. Doubtless not everyone will agree with my judgements and intuitions.

(1) As a first example, consider utterances involving conjoined sentences, such as those in [70].

[70]   (a) He lit the blue touch-paper $\underline{\text{II}}$ but nothing happened

      (b) Jocelyn began singing $\underline{\text{II}}$ and most of the audience began
                                                      leaving

      (c) Either you vote for me $\underline{\text{II}}$ or I send the boys round

For me, such structures require an obligatory ppb between the two S constituents, and this I have indicated by means of the symbol $\underline{\text{II}}$.

(2) The same is true of sentences involving a preposed adverbial dominating a S:

[71]   (a) If I didn't know better $\underline{\text{II}}$ I'd have thought Vernon was sane

      (b) When Grimshaw arrived $\underline{\text{II}}$ all the flowers wilted

      (c) As it's you $\underline{\text{II}}$ the answer is 'no'

(3) Certain sentence adverbials, when placed directly after a subject NP, must be separated off by ppb:

[72]   (a) Algernon $\underline{\text{II}}$ in my view $\underline{\text{II}}$ should be eliminated

      (b) Henrietta $\underline{\text{II}}$ of course $\underline{\text{II}}$ complained of not having been raped

      (c) Gustav $\underline{\text{II}}$ perhaps $\underline{\text{II}}$ will try to pickle the oysters

      (d) Fauntleroy $\underline{\text{II}}$ however $\underline{\text{II}}$ merely spat on the floor

      This does not apply to all such adverbs, however, as the following examples show. (The symbol ($\underline{\text{II}}$) marks an optional ppb)

[73]   (a) Jocasta (II) obviously (II) can't stand the pace

      (b) Sneed (II) simply (II) sneezed

      (c) Yolande (II) evidently (II) fancies Cuthbert

(4) Next, notice that although ppb are not obligatory in coordinations of the form A *and* B *and* C *and*... (cf [74a], they are obligatory in coordinations of the form ABC ... *and* X, as shown in [74b].

[74] (a) Tom (Π) and Dick (Π) and Harry were all blind drunk

    (b) Tom Π Dick Π and Harry were all blind drunk

(5) A well-known type of sentence involving obligatory ppb is that illustrated in [75].

[75] Pontius used to be Π and Quintus now is Π the most powerful man in the syndicate

(6) Perhaps the most interesting case is that illustrated in [76], [77].

[76] (a) We now consider the case of students who have failed an examination (Π) through illness

    (b) We now consider the case of students who failed Π or failed to take an examination Π through illness

[77] (a) Tom and Dick and Harry (Π) were all blind

    (b) Tom Π Dick Π and Harry Π were all blind

We see that the (b) examples contain obligatory ppb where the (a) examples have optional ppb. The explanation for this appears to be that given a string of the form

$$\ldots \; [\leq \xi \Psi, \geq 1 \Pi] \; X \; [\xi \Psi] \; \ldots$$

where X contains no boundary specified [$> \xi \Psi$], then the [$\xi \Psi$] boundary is obligatorily a ppb, that is, it must be specified [$\geq 1 \Pi$].

These, then, are just a few of the cases where particular types of syntactic structure seem to require an obligatory ppb. As noted at the beginning, my remarks have been rather unsystematic, and I would not claim to have a great deal that is of substance to say on this topic (with the exception of the last case discussed). There are two reasons for this. The first, noted earlier, concerns the difficulty of obtaining reliable data. The second is that it is in many cases not altogether certain what the syntactic structure of the utterance in question should be. There is clearly a need for more research on both these problems, since the question of obligatory ppb is obviously an important one in the study of the relation of intonation to syntax.

Finally, notice that I have made no mention of sentences like the following, whose meaning is usually said to depend crucially on the presence or absence of ppb.

[78] (a) My aunt (Π) who breeds ferrets is beginning to look like one

    (b) I didn't whip him (Π) because he asked me to

    (c) The baby wont sit still (Π) until feeding time

The reason is that I can at present see no way in which the presence vs absence of ppb in these sentences can be considered due to syntactic factors; in fact the relevant differences may be statable only at the semantic level.

4.4   In this section, I shall consider some further processes that are involved in the generation of phonological from syntactic structures, in particular, processes that apply optionally to readjust the phrasing (constituent structure) of an utterance. The input to these processes will be the set of structures obtained as a result of the readjustment into phonological words described in §4.2. I shall refer to these as "post-surface" structures. We shall see that the readjustments in question may be quite far-reaching, so that considerable discrepancy may arise between surface or post-surface structure and phonological structure. As before, constituent structure will be expressed formally by means of the feature [Ψ].

Let us begin with a fairly simple example, [79]; line (i) shows the post-surface structure, and lines (ii)-(iv) three phonological structures corresponding to versions of the utterance by three different speakers; specifications in square brackets in lines (ii)-(iv) correspond to ppb, while those not in square brackets correspond to pwb. The coefficients of the feature [Ψ] are arrived at in the way described in §3. The internal structure of phonological phrases is not relevant to the present discussion.

[79]

(i)	$[0Str]_0$ Toutes les matières	$[-2Str]_1$	qui n'y figurent pas	$[-1Str]_2$
(ii)	$[0Str]$	$[-2Str]$		$[-1Str]$
(iii)	$[0Str]$	$[-2Str]$		$[-1Str]$
(iv)	$[0Str]$	$-2Str$		$[-1Str]$

(i)	dépendent $[-2Str]_3$ automatiquement	$[-2Str]_4$ de la compétence	$[-4Str]$
(ii)	$-3Str$	$[-2Str]$	$-3Str$
(iii)	$-4Str$	$[-3Str]$	$-4Str$
(iv)	$\leq -2Str$	$\leq -2Str$	$\leq -2Str$

(i)	réglementaire $[-3Str]_6$ du Gouvernement	$[0Str]_7$
(ii)	$[-2Str]$	$[0Str]$
(iii)	$[-2Str]$	$[0Str]$
(iv)	$\leq -2Str$	$[0Str]$

("Any matters not included here are automatically decided by the Government.")

The simplest of the three versions to deal with is that of line (iv):
apart from a process that converts [0Π]-boundaries into [1Π]- or [2Π]-
boundaries, no further changes are required in this case. Lines (ii)
and (iii) are rather more interesting. No changes are needed in
either case for the first two boundaries. (I shall refer to these
by the symbols $|_1$, $|_2$; other boundaries will be dealt with in
similar fashion), and in both versions, $|_4$ is strengthened relative
to $|_3$, and $|_6$ is strengthened relative to $|_4$. The only difference
is that in version (ii), we have $\xi_4 = \xi_6$, whereas in line (iii),
$\xi_4 < \xi_6$ (ξ_i being the coefficient of the feature [Ψ] for boundary
$|_i$). The sort of rule we need to account for these readjustments
is one which transforms a string of the form

$$... [\xi Ψ] ... [\zeta Ψ] ...$$

into one of the form

$$... [\xi Ψ] ... [\geq \xi Ψ] ...$$

where the second of the two boundaries is a ppb at output. Such a
rule is

[80] $\left\langle W \quad [\xi Ψ] \right\rangle_b \quad X \quad \begin{bmatrix} \geq 0Π \\ \zeta Ψ \end{bmatrix} \quad Y$

$\rightarrow$

$\begin{bmatrix} \alpha Π \\ \langle \geq \xi Ψ \rangle_a \end{bmatrix}$

where $\alpha \varepsilon \{1,2\}$

Conditions: (i) $\zeta \leq \xi < 0$

(ii) if a, then b

(iii) $X \neq Z_1 \, [> \xi Ψ] \, Z_2$

[80] is a very simple rule; yet it is sufficient to account for
nearly all the readjustments found in the data I have analysed.
(A number of counterexamples will be dealt with directly). Consider,
for instance, the rather more complex example in [81]. The
coefficients of the feature [Ψ] are given in italics beneath each
boundary; those in brackets in lines (ii), (iii) correspond to ppb;
obligatory ppb are underlined.

[81] (i) [0Ψ]$_0$ Le véritable pouvoir [-2Ψ]$_1$ c'est-à-dire [-3Ψ]$_2$

(ii) [0Ψ] [-3Ψ] $\leq$-4Ψ

(iii) [0Ψ] [-2Ψ] $\leq$-3Ψ

(i) le pouvoir [-4Ψ]$_3$ de décision [-1Ψ]$_4$ abandonne [-3Ψ]$_5$

(ii) $\leq$-4Ψ [-2Ψ] -4Ψ

(iii) $\leq$-3Ψ [-1Ψ] -4Ψ

[81] cont'd

(i) les capitalistes $[-2\Psi]_6$ pour passer $[-3\Psi]_7$

(ii) $[-3\Psi]$ $\underline{<}-4\Psi$

(iii) $[-3\Psi]$ $\underline{<}-4\Psi$

(i) aux mains $[-4\ ]_8$ des experts $[-5\ ]_9$ qui $[-6\Psi]_{10}$

(ii) $\underline{<}-4\Psi$ $[-1\Psi]$ $\underline{<}-3\Psi$

(iii) $\underline{<}-4\Psi$ $[-3\Psi]$ $\underline{<}-4\Psi$

(i) dirigent $[-8\Psi]_{11}$ l'économie $[-9\Psi]_{12}$ nationale $[-7\Psi]_{13}$

(ii) $\underline{<}-3\Psi$ $\underline{\Psi}-3\Psi$ $[-2\Psi]$

(iii) $\underline{<}-4\Psi$ $\underline{<}-4\Psi$ $[-2\Psi]$

(i) et contrôlent $[-8\Psi]_{14}$ le développement $[-9\Psi]_{15}$

(ii) $\underline{<}-3\Psi$ $\underline{<}-3\Psi$

(iii) $\underline{<}-3\Psi$ $\underline{<}-3\Psi$

(i) économique $[0\Psi]_{16}$

(ii) $[0\Psi]$

(iii) $[0\Psi]$

("The real power, that is, executive power, is no longer held
 by the capitalists, but has passed into the hands of the
 experts who direct the national economy and control economic
 development.")

It is easily seen that the input of line (i) is transformed by rule
[80] into either of the versions of lines (ii), (iii).

Not only is [80] a very simple rule, it is also a very powerful rule,
in that it generates a large number of outputs from a single input.
To demonstrate this, I shall take an extremely simple sentence, [82],
whose post-surface structure is given in line (i). Lines (ii)
onward give a variety of different derived structures all generated
by [80].

[82] $|_0$ Oreste $|_1$ assassina $|_2$ l'amant $|_3$ de sa mère $|_4$

(i)0	-1	-2	-3	0
(ii)0	-1	-2	-2	0
(iii)0	-1	-3	-2	0
(iv)0	-1	-2	-1	0
(v)0	-2	-3	-1	0
(vi)0	-1	-1	-2	0
(vii)0	-1	-1	-1	0
(viii)0	-2	-2	-1	0
(ix)0	-2	-1	-2	0
(x)0	-2	-1	-1	0
(xi)0	-3	-2	-1	0

(Orestes assassinated his mother's lover.")

Notice further that each of [82 (i)-(xi)] in fact represents not one but several different phonological structures, according to the way the various boundaries are specified for the feature [π]. For instance, line (v) could be realised in any of the following ways:

[83]

[0ᵞ]₀ Oreste [-2ᵞ]₁ assassina [-2ᵞ]₂ l'amant [-1ᵞ]₃ de sa mère [0ᵞ]₄

	[3π]	[1π]	[0π]	[1π]	[3π]
(i)	[3π]	[1π]	[0π]	[1π]	[3π]
(ii)	[3π]	[1π]	[0π]	[2π]	[3π]
(iii)	[3π]	[2π]	[0π]	[2π]	[3π]
(iv)	[3π]	[1π]	[1π]	[1π]	[3π]
(v)	[3π]	[1π]	[1π]	[2π]	[3π]
(vi)	[3π]	[2π]	[1π]	[2π]	[3π]
(vii)	[3π]	[2π]	[2π]	[2π]	[3π]

Thus the number of different phonological structures generated by [80] from even a simple post-surface structure is very large indeed. One should not expect, of course, that all of these will correspond to equally natural-sounding intonational realisations: there are undoubtedly many important semantic constraints that, in a fully articulated grammar, would operate to filter out various of these patterns corresponding to [82] in particular contexts. This is not important for our purposes, as long as each of [82(i)-(xi)] corresponds to an acceptable pattern in at least one context. This seems to be the case.

It might seem that [80] is so powerful a rule that it makes no significant claims about what constitutes an acceptable or unacceptable intonation contour for a particular utterance of French. Fortunately, this is far from being the case. For given any post-surface structure of the form

$$ \ldots \ [\xi^\Psi] \ \ldots \ [\geq\xi^\Psi] \ \ldots $$

rule [80] embodies the claim that a phonological structure of the form

$$ \ldots \ [\xi^\Psi] \ X \ [<\xi^\Psi] \ \ldots $$

will not correspond to an acceptable intonation contour for the utterance in question. In general, this claim is borne out. For instance, if we take the sentence of [84] whose post-surface structure is given in line (i), rule [80] correctly fails to generate lines (i)-(iii), which correspond to unacceptable intonation contours for this utterance.

[84]

|₀ Il céda |₁ le legs |₂ de sa mère |₃ à son frère |₄ aîné |₅ il y a cinq ans |₆

	[0ᵞ]	[-2ᵞ]	[-3ᵞ]	[-2ᵞ]	[-3ᵞ]	[-1ᵞ]	[0ᵞ]
(i)	[0ᵞ]	[-2ᵞ]	[-3ᵞ]	[-2ᵞ]	[-3ᵞ]	[-1ᵞ]	[0ᵞ]
(ii)*	[0ᵞ]	[-3ᵞ]	[-2ᵞ]	[-2ᵞ]	[-3ᵞ]	[-1ᵞ]	[0ᵞ]
(iii)*	[0ᵞ]	[-3ᵞ]	[-2ᵞ]	[-3ᵞ]	[-4ᵞ]	[-1ᵞ]	[0ᵞ]

("He surrendered his mother's legacy to his elder brother five years ago.")

In fact, not only is rule [80] not too powerful, it is even not powerful enough, in that it fails to generate certain perfectly acceptable phonological structures. I shall give two illustrations of this.

First, consider the examples of [85]; in each case, line (i) gives the post-surface structure, and line (ii) relevant aspects of the phonological structure.

[85] (a) (i) $[0Ψ]_0$ La société occidentale $[-1Ψ]_1$ offre $[-3Ψ]_2$

       (ii) $[0Ψ]$ $[-1Ψ]$ $[-3Ψ]$

       (i)   aux adolescents $[-3Ψ]_3$ moins de liberté $[-2Ψ]_4$

       (ii) $[-2Ψ]$ $-3Ψ$

       (i)   de ce point de vue $[0Ψ]_5$

       (ii) $[0Ψ]$

("Western society offers adolescents less freedom from this point of view")

     (b) (i) $[0Ψ]_0$ Le mode d'élection $[-1Ψ]_1$ est le scrutin

       (ii) $[0Ψ]$ $[-1Ψ]$

       (i) $[\leq ξΨ]_2$ uninominal $[ξΨ]_3$ majoritaire $[\geq ξΨ]_4$

       (ii) $-2Ψ$ $[-1Ψ]$ $[-2Ψ]$

       (i)   à deux tours $[0Ψ]_5$

       (ii) $[0Ψ]$

("The mode of election is a single vote first-past-the-post system in two stages.")

We see that in [85a], a post-surface structure

... $[ξΨ]$ ... $[> ξΨ]$

corresponds to a phonological structure

... $[ξΨ]$ ... $[< ξΨ]$ ...

In [85b], although the precise details of the post-surface structure are not certain, it is clear that *majoritaire à deux tours* is not a constituent at this level, whereas it becomes one in phonological structure. Both of these sentences are thus counterexamples to rule [80].

The common factor in these examples, and in others similar to them in the data, is that they involve a "final" phonological word boundary, final in the sense that no other pwb follows within the same utterance. It would seem that in such positions, the constraint embodied in rule [80] no longer holds. We can account for this by positing rule [86].

[86]

$$W \begin{vmatrix} \xi\Psi \\ \alpha\Pi \end{vmatrix} X \; [\zeta\Psi\;] \; Y \; [3\Pi]$$

$$1 \quad 2 \quad\quad 3 \quad 4 \quad 5 \quad 6 \quad\quad \rightarrow$$

$$1 \quad 2 \quad\quad 3 \quad [\underline{\leq}\xi\Psi] \; 5 \; 6$$

Conditions: (i) $\alpha\varepsilon\{1,2\}$
                (ii) $X \neq Z_1 \; [\underline{\geq}\xi\Psi] \; Z_2$
                (iii) $Y \neq U_1 \; [\underline{\geq}0\Pi] \; U_2$

Second, consider the examples of [87] (the same pattern is followed as before; dotted underlinings indicate the relevant parts).

[87] (a)

    (i) $[0\Psi]_0$ Les maquis $[-2\Psi]_1$ constitués $[-3\Psi]_2$ par

    (ii) $[0\Psi]$ $[\underline{-1\Psi}]$ $\underline{\leq}-3\Psi$

    (i)   les réfractaires $[-4\Psi]_3$ du STO $[-5\Psi]_4$ Service

    (ii) $\underline{\leq}-3\Psi$ $[-2\Psi]$

    (i) $[-6\Psi]_7$ du Travail Obligatoire $[-1\Psi]_6$ naquirent

    (ii) $[-3\Psi]$ $[\underline{-1\Psi}]$

    (i) $[-2\Psi]_7$ vers 1942 $[0\Psi]_8$

    (ii) $[-2\Psi]$ $[0\Psi]$

            ("The maquis, made up of those who refused to cooperate with the Compulsory Work Service (STO), came into existence around 1942.")

  (b)   (i) $.[0\Psi]_0$ Ces experts $[-2\Psi]_1$ qui possèdent le pouvoir

    (ii) $[0\Psi]$ $[\underline{-1\Psi}]$

    (i)   de décision $[-1\Psi]_2$ sont les technocrates $[0\Psi]_3$

    (ii) $[\underline{-1\Psi}]$ $[0\Psi]$

            ("These experts who wield executive power are the technocrats.")

Notice that in these examples too, the phonological structures
cannot be derived from the post-surface structure by rule [80].

The relevant factor here is that the sub-strings in question form
part of the subject noun phrase of the utterance. That is, we
are dealing with a process of the following type:

[88]   ... A [ξΨ] B [>ξΨ] ... → ... A [ξΨ] B [ξΨ] ...

                where A-B is part of the subject.

This readjustment, although not within the scope of rule [80], is
a well-defined process, operating within a specific environment.
I shall not, however, attempt to formalise it here (owing to
certain difficulties in expressing the notion "subject" within the
framework adopted here.)

4.5   Summarising the results of this section, we see that the task we
       set ourselves at the beginning, that of mapping syntactic surface
       structures onto phonological structures, has been accomplished in
       a number of stages. First, we effected a readjustment of surface
       structure into what was called post-surface structure, by delimiting
       phonological words. In this way, we defined the minimal phonological
       phrases of an utterance. Next, came a series of rules (not, for the
       most part, formulated in this paper) which in effect inserted obliga-
       tory phonological phrase boundaries, thereby defining the maximal
       phonological phrases of an utterance. Finally, we saw that variable
       aspects of phrasing could in the main be accounted for by means of
       one quite simple readjustment rule, but we also considered two
       special cases which required additional rules to be posited.

       Together with the rules of §2 and §3, the processes discussed in
       this section comprise a relatively complete grammar of intonation
       for French. There are, of course, some gaps in the account we have
       proposed, particularly as regards the semantic correlates of various
       of the patterns discussed; but as these lie strictly beyond the
       remit of this paper, which has to do with the relation between
       intonation and syntax, it seems justified to ignore them here.
       Within the area of intonation and syntax itself, there are, of course,
       many questions that still require answers (not least, that concerning
       the syntactic correlates, if any, of the distinction between [1π]-
       and [2π]- boundaries, about which nothing has been said). It is
       nevertheless hoped that the present work will at least provide a
       basis for further research.

ON THE THEORY OF REGISTER

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1.   The term register appears to have wide currency amongst non-linguists
     concerned with aspects of language and literature teaching, who assume
     that the term denotes an established technical concept. This assump-
     tion, in spite of the pioneering articles that have appeared over the
     years[1], does not seem to me to be fully justified, and the present
     article is an attempt to rearouse discussion of this area. While the
     term has almost established itself in popular linguistics, linguists
     themselves are perhaps more cautious in its use. Nevertheless,
     researchers in various fields have occasion from time to time to
     allude to, or to assume the existence of, an actual or potential
     theory of register. Without seeking an a priori definition at this
     point, we may take the term to represent an aspect of linguistic fact
     intuited by native speakers: variation in language use, and in
     particular that variation which can be distinguished from accent and
     dialect variation. It is variation of the register type in certain
     of its aspects (formal as opposed to other settings, etc) that is
     assumed as an independent variable in the most successful and
     illuminating studies of the social stratification of language (ie in
     accent and dialect)[2]. With this assumption, studies of sociolinguistic
     stratification have progressed: not only are the relevant sociological
     and linguistic variables becoming empirically established, but there
     has been feedback into our theoretical picture of what a language
     system is and it has become necessary to reconcile variability with
     static models[3].

     To the extent that register is an intuitive notion corresponding to
     a speaker's knowledge of his language, and to the extent that some
     such notion is presupposed as the independent variable in studies of
     socially stratified variation, we have good reasons for wanting a
     renewal of discussion, and a clarification of fundamental postulates.
     It may be that further empirical results in this area require such
     preliminary clarification. We might begin with three notions that
     have arisen in the relevant literature. There is the notion of
     'situation', with its roots in Malinowski and Firth, the precise
     status of which is not always clear in discussions of register.
     There is the question of the relationship between non-linguistic
     'situational' features and linguistic features, a question involving
     attendant notions of determination and choice (the philosophical
     implications of which can scarcely be ignored in this area of
     linguistic explanation which is willy-nilly concerned with an
     explanation of why and when people say/do what.) And there is the
     question of the relation of a theory of register to semantics and
     syntax, the most involved question of all, and one that can only be
     touched on here.

This article pretends to do no more than resurrect these matters and explore them. We proceed by constructing a model of register from first principles, freely drawing on, and interpreting earlier proposals, without any claim to originality. As the initial work was done with a study of the register variation of French in mind, examples are in that language.

2. Situation and situation types

We shall require our model to show how we think situation (the relevant non-linguistic aspects of the social process) relates to language. How does a person know that a 'situation' is the 'situation' it is? One way of answering this is to say that he is in possession of a prior classification of 'situation': he can fit any given 'situation' into the right slot in his classificatory system. Of course, in one perspective all 'situations' are unique: no one 'situation' is exactly like any other (different time, place, actors ...). But all linguistic utterances are unique, and just as we reduce the unique stream of speech to a comprehensible 'code' through the concept of phonemes, so we may do something similar for 'situation'. Metaphorically, we can talk of a 'language' of situations. Putting this more abstractly, a person in the social process makes a generalisation about any particular situation, which enables him to see it as different, the same, or rather, in some other way related to other 'situations' he has experienced. In other words, a 'situation' can be seen as a token of a type[4].

But this is only part of the answer we need. Presumably a socialised native speaker perceives elements of the situation which enable him to make his generalisation and his classification. It is important to stress that some of these elements must be linguistic, others non-linguistic, and that both kinds of signal are 'in' the situation. The terminology which speaks of 'situational' features as if they were distinct in situational function from linguistic features is misleading, and the account of register it leads to is inadequate. If the perceptible elements of situation are not linguistic, then they may relate to semiotic codes other than language. In previous accounts there has been an apparent tendency to regard non-linguistic features as some sort of primitive term not further analysable. This has the unfortunate consequence of suggesting that 'situation' itself is some kind of primitive with, moreover, the power to determine linguistic behaviour, rather than being the construct of creative, meaning-giving processes. There has been the assumption, too, that the description of non-linguistic features is the province of the sociologist and economist. A more fruitful assumption might be that our non-linguistic situation-signalling elements are to be discovered by way of para-linguistic codes (kinesics, proxemics, vestimentary codes, etc). It is at a further level of description, surely, that socio-economic, geographic and cultural factors are relevant: ie. at a level where we are concerned with variation (of which social stratification will be one kind among others) of the various codes themselves. In short, in this perspective linguistic features are being seen as on a par with and (no doubt, in ways of which we have

at present little idea) integrated with non-linguistic (or rather
paralinguistic) features. This obvious fact is obscured in current
models which speak of a 'correlation' between non-linguistic and
linguistic features.

A situation type, then, is recognised (classified) as a result of a
process of generalisation facilitated by the existence of both non-
linguistic and linguistic 'codes'. The adult socialised speakers of
a society are assumed to have simultaneous knowledge of the 'codes'.
Perceptible elements (dress, gesture, location, linguistic and non-
linguistic sounds) enter into these 'codes', giving 'meaning' to the
situation. The fact that some elements rather than others are
present, and presumably the fact that they occur in certain combin-
ations 'means' that the situation is of one type rather than another.
Let us construct a crudely simplified example to see how this might
be understood (Figure 1).

PERCEPTIBLE ELEMENTS

a. <u>Non Linguistic Substance</u>   <u>Non Linguistic Codes</u>

  Large room: people present   Codes of social space
  seated, facing in the same   (public v private, etc)
  direction;   Kinesics, Proxemics ...
  Platform, with table,
  microphone, glass of water,
  papers; behind it facing
  an audience, a male in grey
  suit, he is middle-aged and   Sex and age codes.
  gesticulating as he speaks;   Kinesics, Proxemics ...
  audience is silent; etc.   etc.

b. <u>Linguistic Substance</u>   <u>Language</u>

  The words 'scrutin',   ('Ideational' Component
  'national', 'gagner', etc.   of Language)
  are frequent

  Action process clauses are   ('Interpersonal' Component
  frequent   of Language)

  He uses 'Vous' and
  inclusive 'Nous';
  imperatives are frequent,
  etc.   etc.

<u>Figure 1</u>

If the left-hand column of this scheme reads like stage instructions,
it may be worth observing that theatrical techniques are suggestive
in this domain, and that what is important for our purposes is that we
can carry out such a process of abstraction in the first place, and
symbolise a situation by means of a few perceptible features. There
will, of course, be irrelevant perceptible features: what filters
out the relevant ones is the semiotic codes. These are dynamic and

interactive; presumably the type of interaction is also encoded and situationally significant.

There are some differences between this and other accounts. Firstly, as has already been indicated, we are not setting up 'situation' (situational features, variables, etc) on the one hand, and language on the other. Secondly, we are not assuming situational features to be primitive terms taken care of by the other social sciences. Thirdly, it follows from the first point, that we are not seeking to conceive of register as a correlation between linguistic and situational variables, or as predictability in one direction or the other. Interaction between the linguistic code and other semiotic codes there may be, but the result of such interaction is a classification of situation types. It is the specific role of language in this classification that is the province of register study. Fourthly, we arrive at an issue that is, to be sure, implicit at most in the literature. The impression is frequently given (though it would probably be disavowed by the authors in question) that there exists some kind of deterministic relationship (whether absolute or probabilistic) between a primitive 'situation' and linguistic variables. However much authors in their uneasiness qualify their statements, what we may call the correlation model is liable to elicit, and possibly even necessitates, a deterministic interpretation. One frequently feels uncomfortably close to some sort of stimulus-response explanation of linguistic behaviour. Even an account as cautious as that of Crystal and Davy (1969) in talking of 'situational constraints' as well as of the predictability of situational variables, does not give us clarity in this area. At the extreme one feels that there is a lingering element of would-be causal explanation inherent in the correlation model - causal explanation of human acts of speech, that is. At best there is an unelaborated impression that both constraint and freedom are involved.

Some of these difficulties may be removed if we drop the model of a correlation between situational things and linguistic things, in favour of an approach which focusses on a relation between linguistic (amongst other) signals and situation types, of which speakers in society have (a no doubt variable) knowledge. Instead of the correlation metaphor, this approach means adopting the generative creativity paradigm, now a postulate, it would seem, of almost all schools of linguistics. This is the view adopted here. It involves seeing humans as creative situation-producing agents, and adverting to the fact that situation is not a primitive term, but a projection from semiotic systems of which language is but one. As for constraint, people are constrained in situations in the same sense that they are constrained by their language in the first place. That is to say there may be inherent limits on the form of situation-generating codes; further, once a situation is initiated there are constraints and freedoms (as for a sentence) on the way it may proceed[5]. The extent to which one situationally relevant semiotic code constrains another (say the clothing code) is a separate question. Fundamental to this approach is the view that what is essential is not a 'correlation' between things of different orders (language and non-language), but an ecology of things that cooperate and are similar in

their semiotic functioning. Both linguistic and non-linguistic codes
operate semiotically in relation with a systematic classification of
situation types. Language is thus an intrinsic part of the situation,
not a vehicle for it.

The relationships we have in mind might be summed up in the following
picture (Figure 2):

Non-linguistic

Non
speech
'utterances'

(bundle
of
'labels')

Linguistic

Speech
utterances

Some degree of
interdependency
between codes

Perceptible
elements

Codes

Classified
situation type
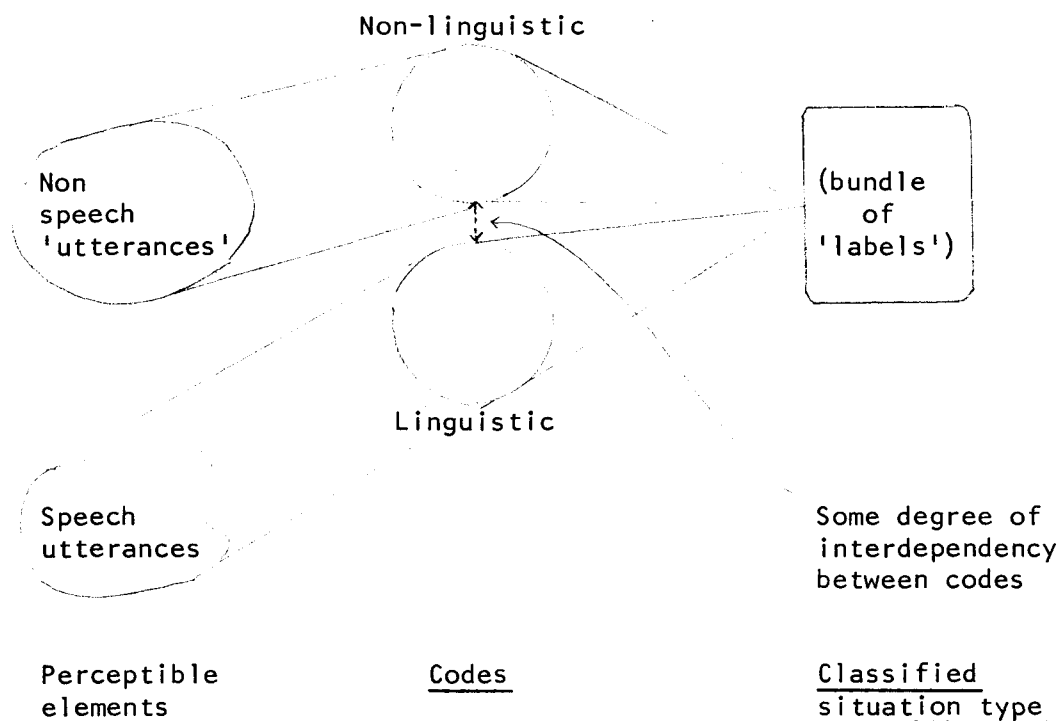
Figure 2

3.   The structure of situation types

The most convenient way of sorting situation types is to think of them
in terms of a bundle of what I shall call, for distinctness, 'labels'.
The method is distantly analogous to the use of features for classifi-
cation purposes, most notably in some versions of systemic grammar,
though it would be quite premature to attempt greater precision as
to the internal logic (binarity, disjunction, etc) required for a
register classification.   Thus we might provisionally propose for the
situation sketched in Figure 1:   {formal, political, persuasive, speech}.
A label can be mediated by more than one element (cf. Figure 2) and more
than one code: we know the situation is 'formal' because of elements
such as suit (v. sweater) in the vestimentary code;   speaker position
in space relative to audience;   syntactical, lexical and semantic
aspects of his utterance.   The question then arises as to whether the

same element can relate to more than one label in the same situation.
Clearly it would be nice to have a many-one function from signifying
elements (both linguistic and non-linguistic) to one label. But
possible counter-examples come to mind: eg. agentless passive may
signify both 'scientific' and 'formal'. It may be that over all
there is a quantitative tendency towards a many-one relation. But
this is an empirical question, and one towards which research could
be directed. Whatever the answer, it seems clear that in the
generation of situation types there is much redundancy - not a
surprising fact, for we are after all dealing with a system of human
communication.

For now we assume that the mapping from sets of codified linguistic
and non-linguistic elements to the 'labels' of situation types is
many-many, but, we assume, from a numerically larger set of signifying
elements, to a smaller set of labels. Of course, it is possible that
a 'label' is in some situations signalled only linguistically, or
only non-linguistically. We might, hypothetically, picture the
relationships in the case of our constructed example like this:

NON-LINGUISTIC CODES   'LABELS' FOR SITUATION TYPES

LANGUAGE

FORMAL

POLITICAL

MEETING

Set of labels
defining the
situation
type
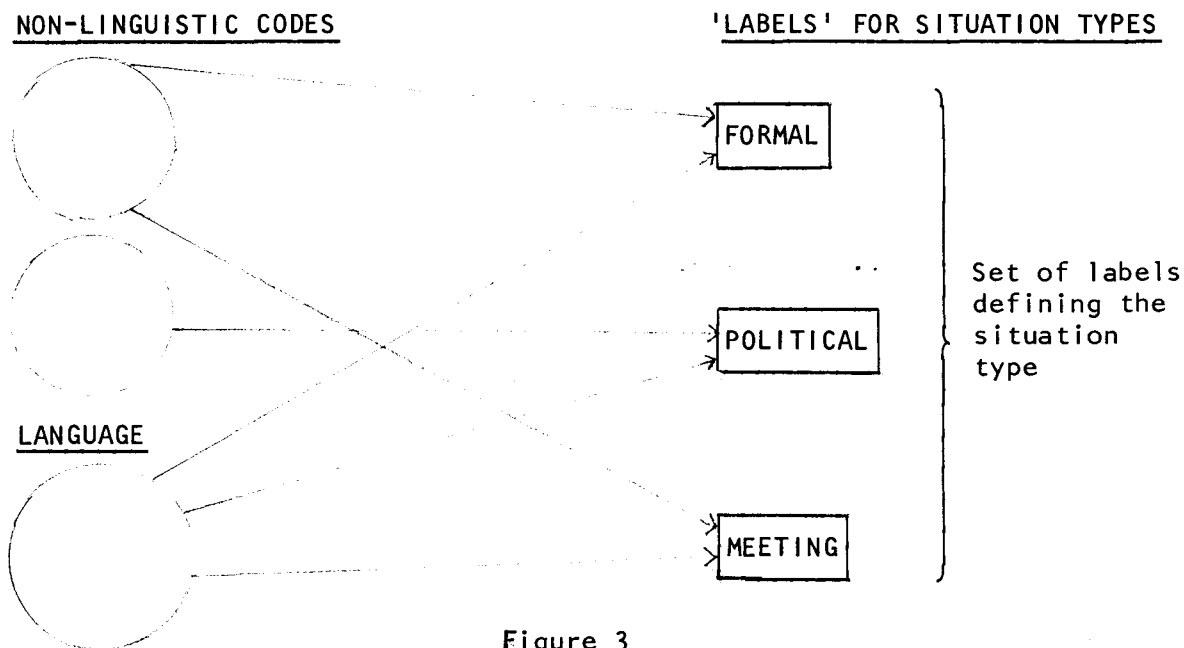
Figure 3

Because of the redundancy, and because a situation type is a coherent,
meaningful entity, a change in one encoded element (linguistic or not)
may entail change in another, and may change the label, and may change
one label but not another. It would be wrong to assume it must do so,
as often is assumed. The mechanisms might be somewhat complex, too
complex perhaps for the present state of the art. Still, awareness
of such possibilities can only be salutory against the oversimplified
extension of register study. The introduction of classifying labels
and situation types is, to be sure, in itself a simplification: but
without it progress seems impossible. The not unreasonable assumption
of redundancy also justifies it. Without labels we would have to

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classify types by reference to the signifying elements (linguistic
and non-linguistic), which, to say the least, would be cumbersome.
Why not map signifying elements directly onto types? This would
be possible, but appears to lead to an oversimple classification of
situation types: what is needed is a means of showing the overlaps
and inclusions that speakers in a community seem to be aware of.

We want to know more then, about these labels, apart from the fact
that they have the desirable property of being fewer than the
elements that signify them. The 'labels' we intuitively want to
use in order to classify situation types seem to fall into sets.
This is obvious enough, since some but not others combine together.
Thus, continuing the earlier provisional example:

formal political speech	informal political speech	informal scientific lecture	formal scientific paper
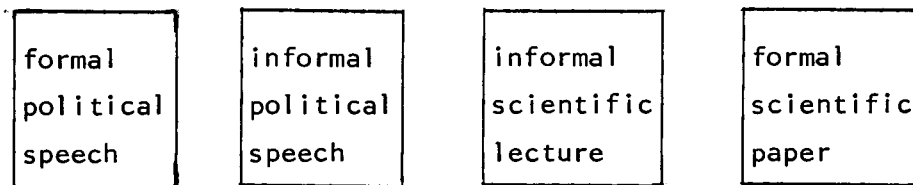
Figure 4

There seem to be different dimensions of variability, which are
relatively independent of one another. We say relatively independent,
since in the above diagram certain combinations seem inherently unlikely
for the socio-linguistic universe we know: eg. informal scientific
paper. In some cultures (Germany and possibly France, amongst others)
the combination 'informal lecture' would be unlikely. This is not to
say that this combination (or indeed any combination) is impossible,
and we must be clear at this point what it is that we want a theory of
register to capture. Many familiar accounts seem to assume that their
purpose is the description of existing 'registers' or situation types
- that is types that are permitted at some point in time by some social
group. This is an unnecessary restriction which complicates any attempt
to build a model of the processes involved. It is also no doubt in some
way bound up with the deterministic implications discussed earlier:
situation determines 'registers', so the only registers to be accounted
for are those that are determined. In our model we do not postulate
any inherent limitations on situation types, or,to use the language of
the model, there are no inherent limitations on the combination of
labels which distinguish, relate, and classify situation types.
Putting it more generally, many types are possible, even if in a given
community some are unlikely. An advantage of this approach is that it
facilitates comparison of register repertoires between individuals, or
between groups of individual speakers.

One further question obviously arises here. If there is no theoretical
restriction on the combination of the sets of labels (and hence
situation types) themselves, do they have to be finite? The answer
depends on the degree of abstraction we wish to adopt, and whether we
wish to take into account diachronic or other variation. (a) At the
most abstract level, we may say theoretically that infinitely many

situation types are possible by arguing as follows. Infinitely many
distinct texts can be generated by the language system. Each text
can be distinguished in terms of unique syntactic and semantic
properties, and/or unique relative frequencies of such properties.
Further, each text can be matched with n̲ other different texts having
the same distinguishing properties. Language is, moreover, an
intrinsic part of situation. Hence, it constitutes a dynamic for
producing infinitely many contrasting situation types. (b) At the
'lowest' level of abstraction, namely the register systems of groups
of individuals, one guesses that the set of situation types must for
reasons of social coherence be finitely manageable, and that the
production of new types in the sense of (a) results in adjustment to
the existing typology, or rather to the way in which linguistic (and
non-linguistic) signifying elements serve to classify types. In
other words, if the dynamic of (a) produces a new type beyond a
certain threshold, the new type may be fed back, reclassified under
some existing type, with accompanying change in the means by which
that type was originally signalled. This is one more aspect of what
might be termed register variation. To sum up these considerations,
a model of register variation must acknowledge at least these
questions, which are empirically answerable. (i) The number of
situation types (which is a function of the number and size of label
sets) may have a limit, which is variable depending on the community,
sub-community, or individual. (ii) The typologies may therefore
vary qualitatively, some having some sets of labels, or some numbers
of sets of labels, but not others. (iii) Some typologies may have
identical label sets, but vary in the combinations realised (ie.
accepted) in practice. (iv) Some typologies may have identical
label sets, hence identical typologies, but vary in the means
(linguistic and/or non-linguistic) by which the same situation types
are signalled. This point is obvious when one considers different
languages, since two different languages may structure situations
identically through different means, but it may well be the case also
between dialects within the same language. All these possible kinds
of variation may have correlations with kinds of social organisation,
and with kinds of group within societies. There are obvious implica-
tions for communication and cooperation which we have hardly yet
begun to think about.

With these qualifications in mind, we can return to the proposal for
'dimensions' of register, ie. the sets of labels yielding a situation
typology. Two questions still remain. How many dimensions, or sets
of labels, do we need? And are the sets unordered, or structured in
some way? With regard to this second question, since situation types
themselves are intuitively interrelated, we can expect the label sets
to show logical relations of some kind. Whether the structure is of
logical relations between discrete elements (eg. 'formal', 'not formal'),
or involves scaling of some kind (eg. less formal... formal... more
formal...), is an open question.

Both these questions ought to be answered empirically in the long run. The source of data would, in view of the considerations above on register variation, have to be fairly homogeneous socially and sociolinguistically. But then sorting tests with situations or parts of situations (texts, videotapes, enactments) might make it possible to arrive at the number, size and structure of label sets required for description. This would, if successful, yield some situation typology in terms of structured label sets. We would then be interested in the perceived signifying elements, linguistic and non-linguistic, and their relationship to the classification process. These might be identified by (a) statistical correlation (ie. between linguistic and non-linguistic elements on the one hand and classifi-catory features on the other, not in the first instance between linguistic and non-linguistic features); and (b) experimental variation of linguistic or non-linguistic features to see how the classification of the situation is affected by changes in signify-ing elements from different codes (ie. not, in the first instance, to see how change in one code is accompanied by change in another).

In practice this means setting up some hypothesis, which presumably would be based on the investigator's intuitive knowledge of his own register repertoire, and that of social groups to which he belonged or with which he had contact. Despite differences in terminology there has been broad convergence on such a hypothesis: namely, the notion of the dimensions of 'field', 'tenor' and 'mode'[6]. Instead of the term 'tenor' we use here the more self-explanatory term 'role relationships' and interpret the dimensions in the language of the model developed above as structured sets of semiotic labels facilitating the classification of situation types. In Figure 5 we have sketched a probably overdetailed hypothesis along these lines, using the usual systemic network conventions to show possible logical relations. 'Field' corresponds roughly to the notion of social role: individuals are assumed to act in a private domain, an occupational domain, and to interact with public bodies. The categories and their inter-relationships signalled semiotically will not necessarily be those of the sociologist, though it has sometimes been implied that this is the case. 'Role relationships' seems to be necessary in order to account for the signalling of different roles within the sub-categories of 'field', and for the relationships between different roles that may distinguish situation types. 'Medium' is set up to handle genre-type variations, due to physical medium, and physical determinants of situation type, like the actual number of participants, and the physical space between them. (These are the only situation features that may fairly be regarded as constraints on the communica-tion processes.) Each of the three dimensions yields an unordered bundle of labels. For example, (non-technical, political), (actors not same sex, not peers, etc), (events, evaluate, persuade), (speech, etc, oration), might work as a first approximation to the 'political meeting' example discussed earlier. Each such bundle can in theory be combined with any other from the other two dimensions. The hypothesis is, of course, justified only to the extent that it can be shown to yield a typology of situations that some group, groups or individual 'knows'.

FIELD

technical
non-
technical

public
institutions → religious...
non-
religious → education ...
commercial
legal
political

private → domestic ...
occupational ...

ROLE
RELATION-
SHIPS

personal
distance

status
distance → not
equals → senior to inferior
inferior to senior

equals

age → peers
not peers ...
sex → same sex
not same sex
kin → related
ship → not related

affective
distance → (agression ... affection)

→ (stranger ... intimate)

functional
role

referent
orientation → describe
evaluate
objects
events

to
addresser → values
affect

to
addressee → mental
state → expound
persuade
action → coerce
transact

MODE

medium → speech → face-to-face
other (telephone, etc)

spontaneous
non-spontaneous → read from script, etc
recited, etc

writing → speech-
related → to be read aloud
imitating speech
not
speech-
related

participants

two participants
more than two

discourse
type → one-way → oration
other types ...

two-way → conversational
other types (interviews,
meetings, etc) ...

Figure 5

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4. The relationship between situation types and language

4.1. In focussing on the relationship between situation types (signalled by bundles of labels) and specifically linguistic elements, it is important to bear in mind that linguistic elements and non-linguistic elements may coincide, but do not necessarily do so. For instance, 'formal' may be partly signalled by language, partly by other codes. It may be that a full understanding of the social semiotic that handles the classification of situation type must refer to both linguistic and non-linguistic codes. This does not mean, however, that we need refrain from investigating the contribution (surely a major contribution) of language, always remembering that this may only be a partial account. Any situation-type classification arrived at through considering language alone may have to be modified if non-linguistic codes are also thrown into the melting pot.

4.2 Situation-type systems may have a good deal to do with the way a culture defines and gives meaning to the social process. But such systems are variable, as was stressed above. This is reflected in the fact that a speaker's production and reception capacities in this respect need not coincide. You may be able to recognise a sermon, even if you can't preach one. A model of situation-type classification will have to be neutral in this respect. However, in discussing the phenomenon, whether one emphasises the production or reception end can affect the model. In the present perspective, the emphasis has essentially been on recognition, and has led to a view of 'register' as a partly language-independent semiotic. The emphasis on production brings the notion of 'constraint' and 'choice' to the fore, and since a production model is habitually to the fore in (generative) grammars of language proper, this has had an effect, possibly a misleading one, on accounts of register. Halliday's 'meaning potential'[7] is clearly a useful concept in discussing register, since in the terms of our own model, the situation-type system provides the wherewithal for explaining the selection of meaning - social meaning. At the same time it raises far-reaching questions concerning the delimitation of syntax, semantics and the register phenomenon. If 'meaning potential' is used to describe the selection of meaning from language (in a semantic syntax theory), it is easy, but questionable, to extend it to cover choice in situations.

In the present model we make a clear distinction between semiotic and semantic (whether the latter is also syntax, or not). Let us say that choices can be made within the language system independently, but that once such semantic choices have been made, you enter, as it were, another sphere of meaning - namely, the social sphere, with its own system of contrasts. We refer to the latter as semiotic. This separation of powers probably has further theoretical implications, and it may be as well at this point to summarise what we have said so far about the relationship between the linguistic and the non-linguistic in the following picture (Figure 6).

```
                           situation-type
                           system (socio-semiotic)


                    Situation
                    type (set
                    of labels)
                       /  \
                      /    \
                 text <-- - - - - - ->text



        language                              non-linguistic
                                                   codes
```
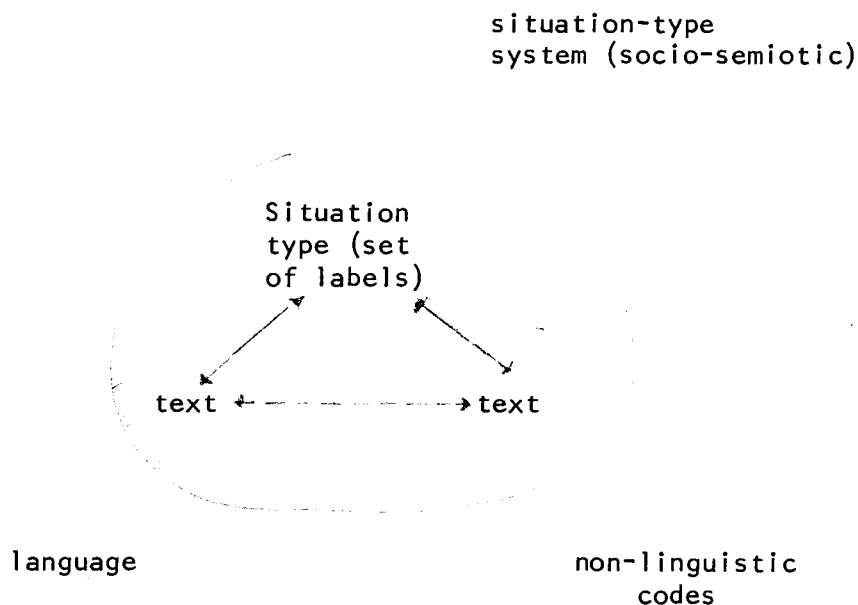
Figure 6

The shaded area represents the 'coded' part of the physical situation. The solid arrows are mappings from linguistic and non-linguistic codes to labels, the broken arrow possible dependencies between the codes. 'Register' is now defined as socio-semiotically classified linguistic text.

4.3   With this distinction in mind, we review some further issues implicit in investigations of the relationship between language and situation-type, not in the expectation of resolving them, but merely in the hope of raising them, and others they may suggest, to the surface. The central questions are which linguistic elements are involved in the socio-semiotic system of situation types, and what kind of mappings from the linguistic to the semiotic set we are faced with. These are familiar enough questions to any one who has tried register analysis of linguistic material.

From the reception standpoint, a text produced by the language system is secondarily classified by the semiotic system, by virtue of the way some (not necessarily all) linguistic elements relate to labels. Thus, amplifying part of Figure 2, we may have, for example:

formal

political

speech

label bundle
classifying the
situation-type

l_1

l_2

l_3

$\vdots$

l_n

linguistic elements
belonging to whole
text
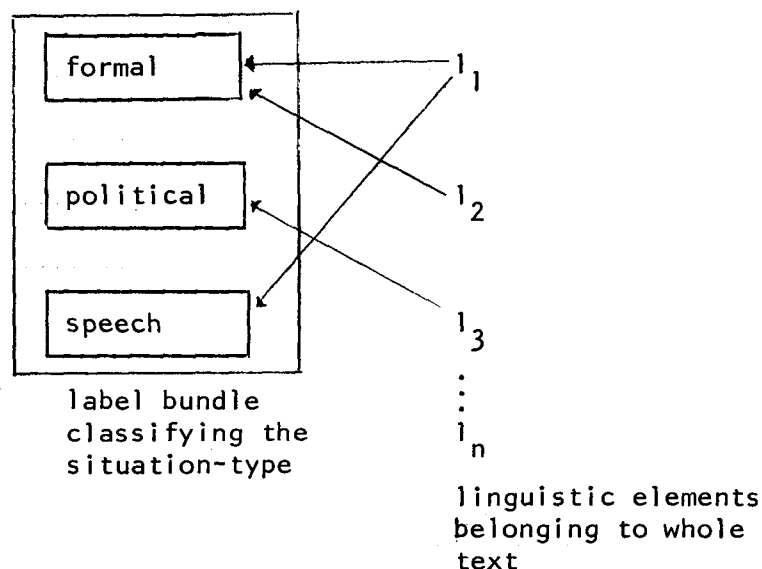
Figure 7

The specific bundle of labels classifies the text, ie. relates it
to other texts, and since language is part of situation, classifies
(or contributes to the classification of) the situation. The many-
to-many relationship between the two sets is obvious enough, but
there are other questions that can be asked.

A fundamental question surely concerns the unit of language
substance that is relevant in the model developed so far. And
this is closely related to more often mentioned questions concern-
ing occurrence or relative frequencies of linguistic elements.
Suppose, for instance, that the sentence is taken as the smallest
relevant unit. It is quite likely that speakers can sort isolated
sentences according to the situation-type semiotic. In which case,
they are likely to be doing it on the basis of either (a) the single
occurrence of a particular selection from sufficiently identical
semantic or syntactic alternates (say, for the sake of argument,
negation: pas rather than ne ... pas; interrogatives: est-ce que/
inversion/intonation/ the ti-forms found in some varieties; or
(b) the single occurrence of a linguistic element not belonging
to such series (say, imperative/declarative/interrogative; presence
or absence of relative clause, agentless passive/active, etc). In
the case of (a) we seem to be in the presence of an inherent
structuring of the language system for purposes of register
discrimination - assuming, that is, that forms like pas/ne ... pas
are sufficiently semantically identical. In the case of (b),
however, we are in the presence of semantic differentiations, and
there arises the difficult question of whether and how such elements
are significant for the situation-type classification. When we turn
to whole texts (how text is defined need not affect the argument
here), we may ask whether the classification will be any different
from one based on sentences extracted from the texts, and how much
of the text is needed for optimal register classification. If so
(as seems likely), the considerations raised for sentences are all

affected by statistical considerations, as well as by considerations
of text semantics. Most studies of register assume that some
statistical variation between texts is an index of register. There
is the obvious question here concerning the linguistic elements to
be counted. But even assuming we alight on a linguistic element
that by all the usual tests of significance shows that two texts
belong to different populations, there is clearly no guarantee that
this will correspond to any distinction in the classificatory
semiotic of register. There are two general points arising from
these well-known observations. One is that statistical approaches
might be more effective if related to what might be termed speakers'
register-competence. The other follows from this. Register studies
have not generally taken the step of explicitly attributing to
speakers a knowledge of frequencies, or probabilities, by which
they distinguish texts in the situation-type semiotic, but this
step is implied by the present model[8]. The mappings from
linguistic elements to different labels will in some instances be
associated with probabilities.

The task of specifying such mappings and their probabilities is a
formidable one. One way of approaching it would be to investigate
correspondences between subcomponents of the language system and
subsets of the classificatory semiotic. Whether this can be done
is in itself highly speculative, but it is the burden of the only
significant proposal that is available in this area. This is
Halliday's proposal that there is a systematic correspondence
between dimensions of situation, his field, tenor, mode, and his
components (macrofunctions) of the language system, namely the
'ideational', 'interpersonal' and the 'textual' functions. The
status of these functions themselves is of course at issue here.
It has been claimed that there are syntactic reasons (within a
semantic syntax model) for this division of labour: namely that
there are 'relatively more' network connections between certain
systems, that this results in three subsets, and that each has a
distinctive function denoted by the names mentioned above. In so
far as this involves the semantic syntax controversy, as well as an
empirical question of a quantitative nature, the notion seems no
more at present than a very useful heuristic device. This particular
issue cannot be pursued here. Even assuming the three functional
components of language are demonstrable, certain questions pose
themselves. If the correspondence between dimensions and macro-
functions is supposed to be one-to-one, possible counter-examples
spring to mind. For example, past historic may well be thought
to relate to semiotic labels from at least two of the dimensions,
formal, narrative, written, etc; agentless passive may be thought
to relate to scientific, formal, written, etc. If this is the case,
the macrofunction notion simply does not help. Of course, it may
be that one linguistic element (like, past historic, passive, in
this example) can be regarded as belonging simultaneously to two or
even all of the three functions. But if this happens extensively,
as is possible, it does not help the validity of functions within
the theory of grammar. Functional components could turn out not
to be necessary for the description of syntax at all, in which case

they could be purely interpretive, ie, indicate the possibly
multiple functions of elements like past historic, agentless
passive, etc. In this case, it would seem, they would tend to
coincide with the dimensions of situation, and become redundant.

This brings us to a brief consideration in conclusion of a
related matter. How much of what is described in the situation-
type semiotic in our model can be merged with semantics in a
model of grammar (independently of syntax or otherwise)? This
is an area in which once again the only significant proposal
on the interdependence of situation and language has come from
Halliday[9]. These proposals are plausible for certain delimitable
situations (parent-child interaction in Halliday's account), and
for a certain view of situations generally. Linguistic options
are treated as behaviour options within the delimited situation
and are treated as contained within the semantic-syntactic
organisation of language. There is no need here to reproduce
criticisms that have already been made, but we add the following
observations, in order to distinguish the present model of inter-
situation contrasts with Halliday's intra-situational model.

First, the advantages of separating the socio-semiotic from the
linguistic semantic components emerges from a consideration of
forms like vous/tu. In our model the personal pronoun system of
the grammar would concern itself only with such features as
singular/plural, and addresser/addressed/other. When and where
you choose to say tu, for example, need not be represented there,
though presumably it would be in a Halliday-type account of
situations where vous/tu selection was relevant. Clearly the
social significance of pronoun choice needs to be represented
somewhere. To do so in the grammar seems a very cumbersome way
of doing things, and there are a number of advantages in making
use of an independent social semiotic component. In our model
where and when you choose vous/tu would be accounted for in the
semiotic system of role relationships, and would involve perhaps
subdimensions 'solidarity', 'physiological distance', 'affective
distance'. While the Hallidayan analysis of the internal structure
of situations like parent-child control certainly tells us something
valuable, it does not seem designed to tell us much about the
organisation of language, or about the overall organisation of
situation-types with respect to one another. Looking at it from
the situation end, we could envisage a list of situations with
their own internal structural potential, but the semiotic that
relates them would be absent. Also it seems uneconomical: for
instance, vous/tu choice is required in many situations, and
presumably similar specifications of a socio-semiotic kind would
have to appear for each one. The same would be true for many of
the linguistic elements. Moreover, for some situations only parts
of linguistic systems might appear: the grammar would be fragmented.
Looking at it from the grammar end, we could envisage including the
socio-semiotic specification for vous/tu in the semantic/syntactic
systems; but many other linguistic systems might require the same
specifications. There would be duplication, and we would scatter
and lose generalisations about register that would otherwise be
possible. If, on the other hand, we keep the semiotic systems and

the grammatical systems separate and independent, we keep them
coherent and economical, we are able to show relations within
grammar, and also relations within the social semiotic systems.
There is still a messy part - the mappings from labels to
linguistic elements - but on balance it seems preferable to
handle the matter in this way. For one thing, this is possibly
where the most variation occurs: ie. which linguistic elements
are used to signify which situation-types may vary rapidly
according to social and temporal factors, while the semiotic
system on the one hand, and the semantic/syntactic system on the
other, may be relatively stable. The vous/tu choice is a case in
point. A focus of study, therefore, would be the label-to-
language mappings and their variability. The register phenomenon
is essentially fluid and we need a model that can reflect this.
In order to show that people change situations, situation
classifications, and the means of signalling situations, it is
necessary, we have suggested, to see register as the product of an
interaction between language and independent semiotic faculties.

FOOTNOTES

1 See bibliography. The present approach is most indebted
   to Gregory (1967), Crystal and Davy (1969), Halliday (1973),
   and personal communications from Chris Butler;
   responsibility for its weaknesses is of course the author's.

2 For instance the work of Labov (1970).

3 Cf. Ch. J. Bailey (1973).

4 A similar point is made in Halliday (1975) and Gregory (1967),
   Gregory and Carroll (1978), but many discussions of register
   are inexplicit in this respect.

5 One can of course create 'deviant' situations; people who
   do so frequently and extensively are categorised by social
   codes as 'eccentric' and so forth, through to 'psychotic'.
   Register theory may provide approaches to problems of psycho-
   social adjustment.

6 Cf, Halliday (1973, 1975), Gregory (1967), Gregory and Carroll
   (1978). A combinatorial system of dimensions, or something
   similar, has been assumed by most attempts to describe the
   register phenomenon, though their number, and the associated
   terminology has varied confusingly: Gregory's (1967) attempt
   to subclassify medium and mode has been imitated for all the
   dimensions in the present schema.

7 Halliday (1973):52ff.

8 Cf. Bailey (1973):80. On proposals that probability distribu-
   tions are part of competence, at least as far as phonological
   variation is concerned.

9 Halliday (1973):72ff. Some far-reaching objections are
   stated in Fawcett (1975).

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TOWARDS AN ANALYSIS OF CASUAL CONVERSATION

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This is a paper for researchers in conversational analysis, presenting
some suggestions for adapting the apparatus described in Sinclair and
Coulthard (1975), Towards an Analysis of Discourse: the English used
by Teachers and Pupils, with the aim of developing a rigorous socio-
linguistic description of casual conversation. It is organised as
follows:

1. Introduction

2. Description of the data

3. An informal description of a proposed rank scale for
       analysing the data

4. A formal description of that rank scale

5. Examples of coded data

1.   Introduction

This paper is written with discourse analysis researchers in mind,
specifically those researchers who find the ideas presented in
Sinclair et al (1972) and more fully in Sinclair and Coulthard (1975),
rich in potential, yet difficult to apply to data other than, say,
authoritarian classrooms, or recordings of parent-child interaction,
where the adults are behaving in a demonstrably educationalist pattern.
Notice, first of all, that this difficulty is fully and explicitly
anticipated in Sinclair and Coulthard (pp 6-7, p 112), and yet the
authors do not clearly suggest ways in which their rigorous socio-
linguistic descriptive apparatus might profitably be adapted to cope
with other situations. In particular, they do not suggest how it
might be adapted to cope with the non-institutionalised situation of
casual conversation.

Experience suggests that many researchers have had considerable problems
in using the scheme (see, for example, McNight 1976, McTear 1977). I
have had very similar problems, but have recently managed to see my
way around some of them. I have however been using unusual data (see
the description and explanation below), and would be very interested
to hear whether the ideas I shall offer in the main body of this
paper are (a) sufficiently clearly expressed to be of practical use
to other researchers; and (b) applicable to the coding of data
collected and classified in ways that differ from my own. In particular,
of course, I am interested to learn whether or not my suggestions are
really relevant for the analysis of casual conversation.

Since the paper has a specific audience in mind, it takes several things for granted which I should make clear at this point. Firstly, of course, it assumes an intimate and detailed knowledge of the practical aspects of the analytical apparatus set out in Sinclair and Coulthard, in chapters three and four. It also assumes the importance of the four criteria for a satisfactory structural description given originally in Sinclair 1973, but restated in Sinclair and Coulthard, pp15-17, which distinguishes this work from the rich, insightful, but less rigorous work of the socio-linguists - Sacks, Schegloff, Jefferson, Speier, etc. Similarly, it assumes familiarity with the extremely micro-functionalist approach to the analysis of spoken discourse, where all utterances are seen as functioning only in terms of the ongoing talk, and where - to take the extreme example - an item classified as an "aside" has no function at all, and as opposed to other functionalist schema, as proposed by Jakobson, Hymes, Halliday, etc, where all utterances are considered as functioning in terms of the talk, the participants, the real world, and so on, and carry several different functions simultaneously. Similarly, I take as read the notions of "situation", and "tactics", and the concept of a "push-down mechanism" whereby it is the place in the ongoing discourse which decides how items classified by grammar and function are ultimately defined.

I also take for granted some knowledge of the later SSRC-funded research project at the English Language Research Unit at Birmingham, "The Structure of Verbal Interaction in Selected Situations", and other related research reports and papers from English Language Research students. Where this requires specific reference to unpublished papers, I shall try to spell out all relevant aspects. Notice though that this later work tends to consolidate the paradigm, and therefore a knowledge of the principles of the work detailed in Sinclair and Coulthard should be adequate for readers of this paper. I do have another paper (Burton 1977a) which - somewhat laboriously - details this later work, and I can supply copies of this should any reader feel the need for this background exegesis.

The material in this paper is an informal version of Chapter six of my PhD thesis, and I guess a brief description of relevant aspects of this work should also be made clear at this point. Overall, I consider the relationships between some pieces of modern drama dialogue, and what conversational analysis can say about naturally-occurring conversation. I do not, of course, take the naive view that dialogue which sounds to the lay-person "just like real conversation" is like real conversation - the surprise that our Undergraduates express on seeing their first transcript of real talk is evidence enough that all play-talk is tidied-up talk. Neither, though, do I think that David Abercrombie's rather neat description of traditional play-dialogue as "spoken prose" (1959), is adequate for more modern pieces (like Pinter or Mamet for example) where a substantial number of audiences and readers have the impression that something like real talk is being produced on stage or in the text. My thesis is a mixture of stylistics and discourse analysis, and in both these disciplines, it is generally agreed that it is with impressions and intuitions

that the analyst begins his work (see for example, Labov 1970, Turner 1970, Schegloff 1968, Sinclair 1968, Halliday 1973, Sacks 1972). The interesting linguistic job is then the explication of these intuitions. So, basically, the thesis asks two questions; what can the work in conversational analysis enable us to say about the talk in modern plays, and what can the talk in modern plays tell us about the ways in which real conversations work?

The second of these is obviously more relevant for this paper, so let me concentrate on that for a while. I think that using drama scripts as if they were transcripts can be extremely revealing on several counts. They are of course conversations designed for over-hearing. This needs to be taken into account at some point, and I suggest ways of doing this in Burton 1977b. Sinclair and Coulthard suggest (pp 115-6) that this is not necessarily a phenomenon of artificially produced talk alone, and certainly the very rich sug-gestions in Goffman 1971 and 1975 would indicate that much of our everyday behaviour, including of course, talk, is designed with overhearers in mind. I do not therefore consider this feature of play-talk a particular problem as far as this paper is concerned.

A familiar problem for analysts trying to describe phenomena in which they have user's competence, is that of finding it sufficiently problematic to be analysable. I have covered this fairly fully else-where (Burton 1976a), but let me just point out here that a surprising number of writers, in disciplines relevant to conversational analysis, have remarked on this problem repeatedly (see, for example, Goffman 1963, Chomsky 1968, Laver 1970, Garfinkel 1967, Glaser and Strauss 1967, etc). In using drama dialogue as data, I am following Garfinkel's recommendation that the analyst needs to find something rather odd and alienated (in the Brechtian sense) as material to study, in order to discover and explain the rules by which we work in interactive situations. Thus, drama data is, to borrow Herbert Spiegelberg's phrase "an aid to a sluggish imagination". In itself, it enables the analyst to distance himself from his material, but, more importantly, since much modern drama is in its own alienation tradition, where the drama is structured to enable the audience to perceive aspects of their own lives more clearly and objectively, (see Brecht 1963), by choosing drama which concentrates on the problems and delicacies of interaction itself, it is at least probable that I am dealing with potentially rich data.

Also, since it is the case that drama scripts are tidied-up versions of talk - adhering closely to the two basic Sacksian rules (1972) that "one party speaks at a time" and "speaker change recurs", many of the problems inherent in recordings and transcripts of naturally-occurring talk are not present. There are no problems of unclear utterances, overlaps, false starts, and so on, which are not intended as oddities by the dramatist. Similarly, many of the paralinguistic problems are removed - we are in possession of as much of the para-linguistic information that the dramatist considered necessary for our understanding, and no more. Thus we do not have clear and explicit indications of intonation, kinesics, non-verbal props, etc, but we

have enough to get by with. I would like to suggest, that, given
the particular goal of furthering descriptive work in the analysis
of conversation, and the present state of the art, it is in fact
to our advantage to take situations with some of the problems
removed (see Grimes 1975, p35, Sinclair and Coulthard 1975, p6).
It may well be the case that just as dramatists stick very rigidly
to those two basic rules they may also maintain the more fundamental
mechanisms of conversation in general. Sorting out what they do
with their edited "naturalistic-sounding" talk, may well help us
on the road to the ultimate task of working out the rules that
operate in real talk. I do not wish to make the claim about the
maintenance of fundamental rules strongly, but if it is the case
that this sort of material does help us extend the basic require-
ments of discourse analysis apparatus such that other researchers
can more easily build on whatever is needed to cope with their
naturalistic data, then drama data will have proved an extremely
useful catalyst.

It is also the case that drama data does not depend on any a priori
notions of institutionalised situations - either in terms of jobs
to be done via the talk, or participants, or statuses. Of course
the data does demonstrate such variables, but they become apparent
via the talk, and not because the analyst has gone out to get
"doctor-patient talk" or "mother-child interaction". It is also in
the nature of drama - several boring avant-gardeists excepted - to
produce interesting interactions. Thus, peculiar events arise, and
the analytical apparatus has to be enriched to cope with them. Most
importantly here, in regard to the possible extension of the Sinclair
and Coulthard framework, drama dialogue presents conflict. This
conflict is a complex matter, and needs to be taken account of at
all ranks, but this feature alone makes the data radically different
from almost all the other data collected and analysed in this way
before. Crudely, my interactants, ficticious as they are, "argue",
"try to assert themselves", "insult each other", "refuse to do what
they're told", "don't bother to be polite" and so on. In short,
they exhibit all sorts of conversational behaviour that will not fit
into the collaborative-consensus model that the Sinclair and Coulthard
system represents. A little of this conflict material can be accounted
for as Act rank. So that, for example, if the data shows patterns of
"accusations" and "excuses" (see Austin 1965), then these are easy
to build in, and apart from considerations such as economy, delicacy,
elegance, etc, there is little of linguistic interest here. The
really nice problems occur further "up" the rank scale, requiring
in particular, a revised notion of "Move" and "Exchange". It is this
set of problems, and my attempts at solutions that this paper hopes
to make clear.

2.   Description of the data

The alterations I have made to Sinclair and Coulthard's discourse
analysis apparatus enable me to cope with the following data: Pinter's
The Dumb Waiter (1957), Stoppard's The Real Inspector Hound (1968),

and Watson's translation of Ionesco's The Bald Prima Donna (1950).
For simplicity's sake, I shall take my examples from the Pinter
text only, for the rather straightforward reason that the play has
only two participants. Like Schegloff and Sacks (1973) I believe
that conversations with two interactants have a subtly different
structure from conversations with three or more interactants.
Whilst I have no difficulty in using the coding scheme for my data
where there are three or more interactants, decontextualised
examples would require complicated annotation and explanation. I
also want to give a brief description of the play for those
unfamiliar with the material, and obviously it is just more practical
to give a description of one play than three.

The play lasts about forty-five minutes, during which time we
observe Ben and Gus "getting through time with talk", (to borrow
Turner's phrase, 1972), waiting for instructions for someone in a
superior position concerning a "job" they are going to do. It is
obviously a job that involves guns and victims, but details are
left hazy. It also becomes clear that the two men have been working
together for some time, that mysterious telephone calls tell them
where to go for the next job, and that they spend a good deal of
time in anonymous dwellings all over England "waiting". The con-
versation is fraught. They are both on edge, they quarrel and fight,
and talk a lot of small talk as well as touching on what are some
quite important issues. Two mysterious events happen: some matches
arrive under the door in an envelope, but with no message and when
Gus looks outside the door there is no one there. Some little way
into the play, a dumb-waiter descends with mysterious requests for
meals which of course the two men cannot provide. These begin very
prosaically - meat and two veg. style, but gradually get more and
more exotic - Chinese dishes, Greek dishes and so on. The play ends
with Ben "taking instructions" from someone at the other end of the
dumb-waiter's speaking tube, whilst Gus is out of the room. Gus
comes back in. Ben gets ready to shoot him.

My reasons for choosing this play to study are many. Those
particularly pertinent to the application of the Birmingham
descriptive apparatus are worth stating here.

1. The lay and literary-critical observation that Pinter writes
"just like people talk" is no news to anyone. Thus in a thesis
discussing play dialogue and its relationship with real talk, at
least one Pinter play is an obvious - if not essential - choice as
regards material to be described.

2. The Dumb Waiter has obvious procedural advantages in (a) being
relatively short and (b) using only two characters. It also seemed
intuitively interesting, with regard to discourse analysis, in that
there is very little action, but a great deal of talk. True, the
dumb-waiter descends and issues forth bizarre written commands,
matches mysteriously arrive, instructions are given and there is
some putative "action" at the end of the play. Nevertheless, most
of the time is taken up with "mere" talk: a fact which infuriated

its original audience, and has interesting implications for the distinction between small talk in life as opposed to "small talk" on stage. In terms of the microcosmic interaction on stage, Gus and Ben are "getting through time with talk". In terms of the macrocosmic interaction between stage and auditorium, the audience are given, to all intents and purposes, only "talk" as their entertainment or material. In this sense, the interaction itself is what the play is "about", in that our time is spent in watching its development during the forty-five minute span of the play itself, assuming and deducing what has happened in the past, guessing what will happen in the future.

3. In terms of the Birmingham discourse analysis work it also seemed useful to choose this play in that there is a very clear superior/ inferior status relationship presented via the talk. Ben is clearly in control, and this is conveyed almost entirely by verbal means (although sometimes physically as well). There are certainly struggles for dominance that take place during the course of the play, and I suspect we would not find the depiction of their relation- ship particularly interesting if there were not, but nevertheless, Ben is without doubt "in charge" for most of the time. As I pointed out earlier, there is no simple way in which the descriptive apparatus outlined in Sinclair and Coulthard (1975) can be used to account for more casual conversation, and similarly there is no simple way in which it can be applied to this simulated conversation either. Yet, as the only rigorous sociolinguistic methodology available for naturally-occurring talk, it seemed both interesting and important to see what adaptations the underlying model might use or usefully require. So, taking a situation that, in some ways, exploits elements to be found in classroom interaction seemed a sensible place to start to tackle this rather complex problem. I certainly do not claim any particular status for the talk in this play as being "like a classroom", however the talk in The Dumb Waiter reveals several elements which are reminiscent of the elements in classroom inter- action, and it seems intuitively sensible to assume that this might be of assistance to the analyst in modifying and hopefully extending the power of the original discourse model.

It would perhaps be helpful here to bring out those similarities explicitly:

1. The participants are of unequal status. Ben is superior to Gus. This is given us explicitly in the following exchange:

     Ben: Who's the senior partner here, me or you?
     Gus: You.

But it also pervades the following features of the talk.

2. One participant - Ben - is in possession of knowledge that the other has no access to, eg:

```
Gus:    The job
Ben:    What job?
Gus:    (tentatively)  I thought perhaps you might know something

        (Ben looks at him)

        I thought perhaps you - I mean - have you got any idea
        - who it's going to be tonight?
```

3. The same superior participant gives frequent directives whose actions are appropriately carried out, eg.

```
        Ben:    You'd better get ready

                (Gus goes to his bed, puts on his tie and starts
                 to fix his holster)
```

or

```
        Ben:    Show it to me

                (Gus passes the envelope)
```

The reverse possibility, of Gus directing Ben does not occur at all.

4. The inferior participant is not allowed to comment on the superior's use of language, for example the whole of one transaction of which the following is a part:

```
        Gus:    How can you light a kettle?
        Ben:    It's a figure of speech!  Light the kettle.  It's a
                figure of speech!
        Gus:    I've never heard it.
        Ben:    Light the kettle!  It's common usage!
        Gus:    I think you've got it wrong
        Ben:    (menacing)  What do you mean?
        Gus:    They say put on the kettle.
        Ben:    (taut)  Who says?

        (They stare at each other, breathing hard)
```

Similarly, the inferior is not allowed to comment on the superior's non-verbal behaviour, eg:

```
        Gus:    How many times have you read that paper?

        (Ben slams down the paper and rises)

        Ben:    (angrily)  What do you mean?
        Gus:    I was just wondering how many times you'd -
        Ben:    What are you doing, criticising me?
        Gus:    No I was just -
        Ben:    You'll get a swipe round your earhole if you
                don't watch your step.
```

5. The reverse holds for both verbal and non-verbal behaviour, that is, the superior is allowed to comment on and correct both verbal behaviour:

```
Ben:   You shouldn't shout like that.
Gus:   Why not?
Ben:   It isn't done.
```

and he is able to comment on and correct non-verbal behaviour, eg

```
(Gus probes his ear with a match)
Ben:   (slapping his hand)  Don't waste them!
```

or

```
Ben:   Have you checked your gun?  You haven't even checked
       your gun.  It looks disgraceful anyway.  Why don't
       you ever polish it?

       (Gus rubs his revolver on the sheet)
```

There are significant differences between the interactive situation
in the play, and the interactive situation in the formal classroom
which are worth bringing out as well:

1.   The participants are not involved in a common, goal-oriented task.

2.   The superior is not - for the most part - engaged in information
     transfer, but quite the opposite in fact, eg

```
Gus:   Why did you stop the car this morning, in the middle
       of that road?
Ben:   (lowering the paper)  I thought you were asleep.
Gus:   I was, but I woke up when you stopped.  You did stop
       didn't you?

       (pause)

       In the middle of the road.  It was still dark, don't
       you remember?  I looked out.  It was all misty.  I
       thought perhaps you wanted to kip, but you were
       sitting up dead straight, like you were waiting for
       something.
Ben:   I wasn't waiting for anything.
Gus:   I must have fallen asleep again.  What was all that
       about then?  Why did you stop?
Ben:   (picking up the paper)  We were too early
Gus:   Early?  (He rises)  What do you mean?  We got the
       call didn't we?  Saying we were to start right away.
       We did.  We shoved out on the dot.  So how could we
       be too early?
Ben:   (quietly)  Who took the call, me or you?
Gus:   You.
Ben:   We were too early.
```

3.   The inferior has a range of initiations and responses available
for use, quite unlike the limited options available for pupils in the
classroom.

4. It is not, of course, a one-to-many situation. Nominations, bids, etc of the sort used in the classroom are not relevant here.

5. The superior never gives positive evaluation of the inferior's responses or reactions, although he often quite explicitly gives negative evaluation.

3.   An informal description of the proposed rank scale

There seem to be two sets of problems that recur when analysts of data, other than classroom data, try to apply the Sinclair-Coulthard coding scheme. The simple problems concern the topmost and bottommost ranks: Interaction, Transaction, Act, where the analyst needs only to see what recognition criteria are descriptively adequate, to account for these structures and items. Apart from questions of economy, precision, delicacy, this activity is not unduly difficult, and alterations are not necessarily radical.

The really interesting interactive ranks are those of Exchange and Move. And since the description of Exchange structure hinges on what Moves are used in what orders and relationships, and since Move is also the minimal interactive unit, it seems that most analytical problems centre on this rank first and foremost.

Outside the classroom there are several specific problems with the notion and description of Moves as set out in Sinclair and Coulthard. Firstly, the notion of "Feedback" or "Follow-up" hardly ever occurs. Only in minimal ritual encounters (see Goffman, 1971, chapter 3), or in extended formal talk can this be seen as a recurrent feature that needs a special place in a structural description of conversations. I think it may be used in informal talk as a device for conveying sarcasm, but irony, jokes, sarcasm, etc, require another paper to themselves (see the apposite Sacks comment quoted in Labov's footnote, Labov 1970). I will not dwell on that suggestion here, except to say that, if it is the case that casual conversationalists can use Feedback items per se as a sarcasm device, regardless of the realisations of that item, then it must also be the case that Feedback does not occur as a norm in the structure of those casual conversations. This repeated lack of Feedback or Follow-up being the case, any coder using the lay-out of three major columns - Opening, Answering, Follow-up - that works so neatly for the classroom data, merely finds himself with an empty third column. Surely an adequate reason for deleting that third column.

This leaves him with Opening and Answering Moves. Inside the classroom all parties are agreed that time will be spent in the transfer of information from Teacher to Pupils, with a ritualised structure of Informatives, Elicitations and Directives, etc to be employed by the Teacher to that end, and a set of appropriate reciprocal Acts and Moves to be employed by the Pupils to assist in the attainment of the Teacher's end. The teacher is in control of structural choices right through the hierarchy, in that when the Pupils, or selected Pupils,

are given a place to interact, the type of Act they can appropriately use is selected and pre-determined by the preceding Teacher-Act. The teacher is also in control of "content" right through the hierarchy, in that he or she selects the topic for the lesson, the topic for transactions, the topic for exchanges, the topic for appropriate Moves and Acts. Outside the classroom it is not news to anyone that the situation is nothing like as simple, particularly since inter-actants, far from having a job to do via the talk, may simply talk for the sake of talking.

Certainly, structural and topical control are rarely in the hands of one participant only, indeed the common-sense interpretation of a conversationalist finding himself in such a position would be that his co-conversationalist was "difficult to talk with". Whilst Openings which coincide with Transaction boundaries are easy to find, in that of course the recognition criteria also coincide, following Moves are often difficult to categorise, in that they can seem simultaneously to answer a preceding Move and open up the way for a new Move. An extreme analytical view would be to see multiple Openings, where anything that was not a simple appropriate response to a preceding Act, say a Reply to an Elicitation, or an Acknowledge to an ongoing Inform, would be seen as another Opening. This would not however be of much structural or descriptive interest, since there are clearly relationships between successive utterances in casual conversations, even though they do not fit the classroom format. The biggest difference between classroom data and everyday talk is of course the wide range of verbal activities available to anyone answering an Opening. The polite consensus-collaborative model just has no room for the number of possibilities, where, for example, the "answer" can refuse to answer, can demand a reason for the question being asked, can provide an answer that simultaneously answers a preceding Move, but opens up the next exchange etc. This last possibility appears in many people's data, and analysts feel that they need to "double code". It certainly appears in my data, such that to remain within two simple columns representing Opening (including Framing and Focussing) and Answering would only be possible by forcing the data into categories that it does not really fit, and by ignoring other interesting structural complexities that should be represented.

My solution to these problems has been to reconceptualise conversa-tional Moves in a fairly common-sense way, in that it seemed to me to be true that given an Opening Move by speaker A, B has the choice of politely agreeing, complying, supporting the discourse presuppositions in that Move, and behaving in a tidy, appropriate way in his choice of Move and Acts, or he has the choice of not agreeing, not supporting, not complying with those presuppositions, possibly counter-proposing, ignoring, telling A that his Opening was misguided, badly designed, etc. This range of possibilities open to B (and of course subsequently to A, then to B and even to C, D and E) seemed to cluster under two types of conversational behaviour, which for mnemonic convenience I labelled "Supporting" and "Challenging" Moves. I am trying here to keep within the "game" analogy suggested

loosely by the notion "Move". Whilst it would be misguided to press this analogy too far, it is nevertheless helpful to see Moves as items which define the positions of the participants' utterances in relation to each other in the course of, say, a "round" of talk, leaving a different set of information to be conveyed by the choice of constituent Acts for these Moves.

The problem then was to find explicit criteria for recognising these Moves (as well as other more familiar types of Move), an endeavour that became increasingly problematic as the data became more familiar, and I found that I had begun to conceptualise, say, A as "agressive", B as "subservient" or whatever, using these characterisations unconsciously as a way of determining what was being done in the talk instead of the other way round. I eventually realised that the problem could be resolved quite neatly by importing three concepts: a notion of "Discourse Steps" necessary for the establishment of a discourse topic, and an extention of Labov's (1970) pre-conditions for the interpretation of any utterance as a request for action. I think the clearest way to explain the rank scale I am using is from the bottommost rank upwards, so I will do that, and explain these three concepts more fully under my description of Moves.

Acts

Wherever it was possible, I tried to restrict my coding at Act rank to the 22 Acts listed in Sinclair and Coulthard pp40-44. Obviously though, where this would have meant forcing the data into inappropriate categories, I revised and reconsidered that list. For the most part the 22 Acts were adequate, but I made some alterations and some additions. Some of the classroom Acts do not happen to occur in my data, eg "clue". I think it would be unwise, at this stage in the art, to delete them, as possibly they will occur in other data. I have not, however, given them a place in the apparatus here, though, using intuitive examples, it is not difficult to imagine where they might fit.

1. Markers

In the classroom this item is realised by a closed class including "Well", "Right", "OK", "Good", "Alright". Its function is to mark boundaries in the discourse, and it occurs either as the pre-head signal in an Opening Move, or as the head of a Framing Move, in which case it is used with a falling intonation and followed by a silent stress. Maintaining this functional criterion, and given that I also recognise both Framing and Opening Moves in my data (the latter somewhat amended - see below), I also find this set of Markers, but need to extend the realisation list to include items which, following Schegloff in Keenan (1976), I call "expressive particles", for example:

    Ben: Kaw!   Marker + Silent Stress
           What about this?
           Listen to this!

Notice that in cases like this one, I take the exclamation mark
to represent something like the equivalent of a silent stress.

2. Summonses

A similar attention-getting item recurs in my data, when one
participant uses the name of another in order to establish contact
before introducing a discourse topic. Again, this marks boundaries
in the discourse, and can occur either as the head of a Framing
Move or as the Signal in an Opening Move. I have again borrowed
the term itself from Schegloff (1968) in that this verbal item
seems structurally and functionally analogous to non-verbal
summonses like telephone or door bells. Both the verbal and non-
verbal items occur in my data, and I refer to them both as
Summonses:

      Gus: Ben.   Summons
      Ben: What?
      Gus: Look here.   Directive

3. Requests for speaker's rights - Metastatements

Like Summonses, these requests for speaker's rights (cf Sacks 1972),
occur as pre-topic items, being variations on the classic "You
know what" formula of small children with restricted speaker's
rights, or questions, or statements containing "tell", or "ask",
for example:

      Ben: You know what your trouble is.

or

      Gus: I've been meaning to ask you something.

They occur as the heads of Focussing Moves, like Metastatements
or Conclusions. I am tempted to list them as a sub-category or
Metastatement, in that they do contain explicit reference to doing
talking, and since, outside the classroom, there seems only a very
fine line between these items and items that are more clearly
Metastatements, in that they indicate what the next piece of talk
is going to be about, for example:

      Ben: Let me give you your instructions.

The important structural distinction between the use of Metastatements
inside the classroom and outside it, is that in the latter situation
other participants may choose not to allow the speaker using the
Metastatement to go ahead with his designated talk. Thus since
both ordinary Metastatements and requests for speaker's rights
require the approval of the other speaker, and occur in the same
structural place, it would seem economic to see them both as
Metastatement.

4. Permission to go ahead with a topic - Accept

Outside the classroom Summonses, Metastatements and requests for
speaker's rights do not always go unchallenged, and, as a consequence
of this possibility, in fact usually require some sort of "go ahead"
signal from a co-participant. This may be realised by a non-hostile
silence, appropriate attention-giving gestures, formulaic responses
like A: Do you know what?, B: What? or A: Can I tell you a story?,
B: Yes, etc. I label these "Accept", bearing in mind part of the
functional definition of that Act in Sinclair and Coulthard "to
indicate that the Teacher has heard or seen and that the preceding
Act was appropriate". Of course in the classroom, Accept is a
Follow-up Act, whereas in my coding, it is the head of a Supporting
Move.

5. Greetings - Summonses/Accepts

Greetings do not of course occur in the classroom, although they
frequently do so outside the classroom. In that they are
inevitably markers of boundaries in the talk, I see them as
similar to Summonses, for an opening greeting, and Accepts for a
reply greeting. The first-pair part is coded as Summons, the
second-pair part as Accept, thus as the head of a Framing Move,
followed by the head of a Supporting Move.

6. Accuse-Excuse

A particular feature that again doesn't seem to be relevant in the
classroom, but recurs often in my data, occurs when speaker A uses
a statement, question or command that is heard as requiring either
an apology or an excuse/explanation, or justification (cf Austin
1965). This statement, question or command varies in intensity from
mild criticism to serious attack. Wherever the responses to this
type of Act can be coded as an apology, or excuse, I label the first-
pair part "Accuse", the second-pair part "Excuse". The rather nice
ambiguity between the meaning of the noun "excuse" and the verb
"excuse" covers the related but different types of response rather
well.

7. Inform-Comment

Where there are long passages of Informatives offered in the text
it seems inadequate to give one label of "Informative" to the whole
passage, or even to label the first clause "Inform" and all
subsequent units "Comment" - using the definition of Comment in
Sinclair and Coulthard as "to exemplify, expand, justify, provide
additional information". I have here followed some of the ideas
suggested in Montgomery (1976) in his analysis of the discourse
structure of information-transfer lectures. His very neat and
interesting work is described in detail in Burton 1977a. In coding
my data, I have found the following categories useful: Additive,
Adversative and Causal items; Repeat, Restate and Qualifying items;
where, it seems to me, the first three are sub-categories of
Informative as the head of an Opening Move, later informing acts can
easily be classified under these six headings.

Montgomery adapts the first three from Winter's more complex
suggestions (Winter 1977) on clause relationships. Additive items
are typically, but not necessarily introduced by "and", Adversive
items are typically but not necessarily introduced by "but", and
Causal items are typically but not necessarily introduced by "so".
They represent, of course, the three primary relationships to
which, according to natural logic, all propositions can be reduced.

All these types of Informative can then be "expanded" by the use
of the other three Comment items. Repeats are Acts which, more
or less, repeat the exact words, or some of the words of an
earlier Informative. Restate items rephrase an earlier Informative,
and Qualifying items modify the general applicability of a
preceding Informative. All Comment items may also be used to
expand preceding Comment items as well of course. Coding with
these seven labels is no longer coding at primary delicacy, but
in that the data does not conform to the rather simple informing-
patterns required by the information-transfer of the classroom, it
seems uninteresting to do less. In my formal representation of the
rank scale, I have restricted items to the two primaries, Inform,
and Comment, but these should be understood as superordinates. See
also the notes below on coding conventions.

8. Prefaces

Following work on committee data (Stubbs, 1974), I have labelled
Acts which introduce Re-Opening moves as Prefaces. Stubbs recog-
nises three types of Prefaces: Misplacement Prefaces, Interruption
Prefaces, and Personal-Point-of-View Prefaces, which, for my
purposes I find it adequate to collapse into one general Act.

Misplacement Prefaces point out that the utterance following them
will, in some way, be out of sequence. The term is borrowed from
Schegloff and Sacks (1973) where they consider the notion of mis-
placement markers. They are typically, in committee data, rather
elaborate:

        Just one other comment Mike   - you asked me just now what ...

or

        John - y'know this other information ...

Stubbs gives the full possible form of a misplacement Preface as follows:

1	2	3	4	5	6
term of address	mitigation	account	placement marker	self-referential metaterm	meta-reference to other speakers talk

and produces a hypothetical example of how the full form of a misplacement
preface might be realised:

```
1               2                    3                          4
John - erm I think perhaps it would be useful before we go any further

5                              6
if I sum up some of the things Harry was saying
```

Interruption Prefaces are described as a particular type of misplacement
preface, exhibiting surface markers which typically preface items
designed to break into a flow of talk, for example:

    look - look let me let me let me let me make it patently clear ...

The markers include: Repetition of the first syllable or two;
Addressing someone by name; Standard adversative words and formulae -
"but", "no but"; Items such as "can I" "could I" "I must "let me"
plus a self-referential statement. His suggestion for the full form
of an Interruption Preface looks like this:

```
1          2          3
term of    can I      self-referential metastatement
address    could I
           I must
           let me
```

Personal Point of View Prefaces overlap to a certain extent with
Interruption Prefaces in terms of their exponents. If however there
is a clear indication that the speaker is expressing his own point
of view, then the item is categorised specifically as a Personal-Point-
of-View Preface, for example:

    personally I think we really ...

    my real opinion is ...

    I certainly don't ...

This list, though useful for committee data, is in fact rather over-
built for my own data - particularly since it is very much tidied-up
talk. Thus I have collapsed the three types of Preface into one
category of Preface.

Coding conventions

A word or two here about my conventions in coding Acts on the analysis
sheets (see section 5 of this paper). I have loosely followed a
suggestion in Halliday and Hasan 1976, where they analyse texts for
cohesion, in that I have given each Act, usually a single clause
(given the inclusion of Montgomery's categories), a number, indicating
its sequential position within the Transaction. In this way the
coded sheets can show relationships between Acts, these relationships
being rather more complex than the often simple sequences exhibited
in classroom data. Again this is arguably not coding at primary
delicacy but, again, it seemed interesting to add this rather simple
feature in the coding, for the extra information that it gives.

Moves

In the data I recognise seven types of Move: Framing, Focussing,
Opening, Supporting, Challenging, Bound-Opening, Re-Opening. A
discursive description follows.

Framing and Focussing Moves

Frames and Focusses are explicit markers of Transaction boundaries,
and involve Acts that are essentially attention-getting, pre-topic
items. Thus Frames are made up of a head which is either a Marker
or a Summons, and silent stress as qualifier. Focusses comprise an
optional signal (Marker or Summons), followed by an optional pre-
head (Starter), a compulsory head (Metastatement or Conclusion),
and an optional post-head (Comment - including Montgomery's additions
to this).

Opening Moves

Opening Moves may also be Transaction-initial, in which case the
recognition criteria are the same as those for Transaction boundaries
where Frames and Focusses are not employed; that is, they are
Informatives, Elicitations or Directives which have no anaphoric
reference to the immediately preceding utterance. This preceding
utterance can then be seen to be the concluding utterance of a
Transaction. Occasional problems occur in the data, for example,
where a new Transaction can be recognised in this way, but where
the very next utterance, from another speaker, adds what can be
understood in a common-sense way to be another utterance in the
Transaction just closed by the preceding Transaction-initial
utterance. Where this does occur, I annotate the analysis sheet,
but in general I have chosen to see those as overlapping ends and
beginnings, rather than a succession of new Transactions. Opening
Moves then are essentially topic-carrying items which are recognisably
"new" in terms of the immediately preceding talk. Where they are not
Transaction-initial, they follow directly after Frame and/or Focus,
where these have been used to attract the attention of the co-
participant(s) to announce that a new topic will be coming.

Supporting Moves

Supporting Moves occur after all the other types of Move: Frames,
Focusses, Openings, Challenges, Bound-Openings and Re-Openings. The
data has chains of Supporting Moves, but essentially the notion of a
Supporting Move involves items that concur with the Initiatory Moves
they are Supporting. This means that in these chains, each Supporting
Move can be related back to one of the other six types of Move. This
being the case, whilst a Supporting Move may follow another Supporting
Move, functionally it serves to support a preceding Initiatory Move.
Recognition of Supporting Moves depends upon a concept of Discourse-
Framework, which I will outline briefly here.

Discourse Framework concerns the pre-suppositions set up in the
Initiating Move of an Exchange (that is, in any Move other than
a Supporting Move), and the interactional expectations dependant
on that Move. I want to argue that, for casual conversation,
Exchanges can be seen to last as long as this Framework holds.
The Discourse Framework set up by an initiating Move has two
aspects, which, loosely following Halliday 1971 I shall label:
1. Ideational + Textual; 2. Interpersonal.

The first of these, the ideational and textual, is defined lexico-
semantically and can be retrieved from the lexical items used in
the topic-component of any initiating Move. The potential Discourse
Framework dependant on that Move then includes all items that can
be categorised as cohesive with that Move, using the notions covered
in Halliday and Hasan 1976: substitution, ellipsis, conjunction
and lexical cohesion.

The second aspect, the interpersonal, concerns interdependant or
reciprocal Acts, where certain initiating Acts set up the expecta-
tions for certain responding Acts. Here the Discourse Framework
can be retrieved differently from the Acts used pre-topically (in
the optional initial Moves of a Transaction - Frames and Focusses)
and from Acts used in topic-carrying Moves (in the compulsory Opening
Move of a Transaction, and subsequent Re-Openings, Bound-Openings
and Challenges).

Pre-topic Acts include the following:

        Markers
        Summonses
        Metastatements.

Topic-carrying Acts include the following:

        Informatives
        Elicitations
        Directives
        Accusations.

If the appropriate and expected second-pair parts are added to these
initiatory Acts the outline for the interpersonal aspect of the
Discourse Framework is as follows:

        Marker   ..... Acknowledge (including giving attention/non-hostile
        Summons   ..... Accept   silence)
        Metastatement   ..... Accept
        Informative   ..... Acknowledgement
        Elicitation   ..... Reply
        Directive   ..... React
        Accuse   ..... Excuse.

Given this concept of Discourse Framework, a Supporting Move is any Move that maintains the framework set up by a preceding Initiatory Move. If speaker A sets up the framework, then, once speaker B has supported it, he may support it too. The idea in general is, that in casual conversation, speakers can Support a previous piece of <u>text</u> rather than a previous <u>speaker</u>.

Challenging Moves

As Supporting Moves function to facilitate the topic presented in a previous utterance, or to facilitate the contribution of a topic implied in a previous utterance, Challenging Moves function to hold up the progress of that topic or topic-introduction in some way. Challenging Moves can occur after any other Move, with the exception, in two-party talk, of following a Supporting Move. There are different types of Challenging Move whose recognition depends on three different concepts - the idea of discourse Framework outlined just above, the idea of Discourse-topic steps, presented in Keenan and Schieffelin 1976, and an expansion of the necessary pre-conditions for interpreting any utterance as a request for action, as suggested by Labov 1970. I shall take each of these separately.

1.   Challenging Moves and Discourse Framework. A simple kind of Challenging Move is made by withholding an expected or appropriate reciprocal Act, where the expectation for this Act was set up in a preceding Initiatory Move. Thus, absence of, say, a Reply after an Elicitation, or an Accept to a request-for-speaker's-rights Metastatement is seen as a Challenge (cf Sacks 1972, Turner 1970, and Schegloff 1968, on the notion of justifiable absences).

Similarly a Challenging Move can be made by supplying an unexpected and inappropriate Act where the expectation of another has been set up, for example, by producing a Marker where a React has been indicated as appropriate. At its most extreme of course, this type of Challenge filters upwards through the system and effects the opening of a new Transaction. Notice that although I have chosen the mnemonic "Challenge", I do not intend it necessarily to indicate hostility. A Challenging Move may divert the ongoing talk in quite an amicable way.

2.   Challenging Moves and Discourse-topic steps. Keenan and Schieffelin's very interesting paper on topic as a discourse notion, suggests that the following four steps are required in order for the speaker to make his topic known to his hearer:

1.   The speaker must secure the attention of the hearer
2.   The speaker must articulate clearly
3.   The speaker must provide sufficient information for the listener to identify objects, persons, ideas included in the discourse topic
4.   The speaker must provide sufficient information for the listener to reconstruct the semantic relations obtaining between the referents in the discourse topic.

To reformulate this in terms of Challenging Moves, the
listener in this above-described situation may do one of four types
of Challenge - again, either hostilely, or because of poor
recipient design in the first place:

1. He may refuse to give his attention
2. He may ask for a repetition of the utterance
3. He may ask for clarification of information about the
   identification of object, persons, ideas in the
   discourse topic
4. He may ask for more information concerning the semantic
   relations that obtain between the referents in the
   discourse topic.

3.   Challenging Moves and Labov's rules of interpretation. Labov,
amongst his other extremely useful rules of interpretation linking
"what is said" with "what is done", offers a general rule for
interpreting any utterance as a request for action - a directive.

> If A requests B to perform an action X at a time T, A's
> utterance will be heard as a valid command only if the
> following conditions hold: B believes that A believes
> that (it is an AB-event that)
>
> 1. X should be done for a purpose Y
> 2. B has the ability to do X
> 3. B has the obligation to do X
> 4. A has the right to tell B to do X

His own data is interesting in that it shows a speaker challeng-
ing various of these pre-conditions.

I want to add to these four pre-conditions, more pre-conditions for
hearing any utterance as either a valid informative or a valid
elicitation:

> If A informs B of an item of information P, A's utterance
> will be heard as a valid informative only if the following
> pre-conditions hold: B believes that A believes that (it
> is an AB-event that)
>
> 5. A is in a position to inform B of P
> 6. P is a reasonable piece of information
> 7. B does not already know P
> 8. B is interested in P
> 9. B is not offended/insulted by P.

> If A asks B for a linguistic response from B concerning a
> question M, it will be heard as a valid elicitation only
> if the following pre-conditions hold: A believes that B
> believes that (it is an AB-event that)
>
> 10.   B hears M as a sensible question
> 11.   A does not know M
> 12.   It is the case that B might know M
> 13.   It is the case that A can be told M
> 14.   It is the case that B has no objection to telling M to A.

Again, each of these pre-conditions has its corresponding Challenging
Move, as Labov himself makes clear in his own data. In my coding
of the data, I index each Challenge, where it is not a simple breach
of the Discourse Framework, with reference either to Keenan and
Schieffelin (KS1, 2, 3, 4) or to Labov (L1-14), in order to indicate
what sort of Challenge I understand the data to represent.

Bound-Opening Moves

Bound-Opening Moves occur after a preceding Opening, Bound-Opening
or Re-Opening Move has been Supported. They englarge the Discourse
Framework by extending the ideational-textual aspect of the original
Opening Move, employing the various types of Informative and Comment
Acts presented in the discussion of Montgomery 1976 above.

Re-Opening Moves

Re-Opening Moves occur after a preceding Opening, Bound-Opening or
Re-Opening has been challenged. They re-instate the topic that the
Challenge either diverted or delayed. They are made up of optional
Prefaces, as pre-heads, compulsory Informs/Comments as heads.

Exchanges

I recognise two types of Exchanges: Explicit Boundary Exchanges,
and Conversational Exchanges.

Explicit Boundary Exchanges

These are optional Exchanges at the openings of Transactions. They
are made up of a Frame, or a Focus, or a Frame and Focus together,
and must be Supported by another speaker. This Support may be
negatively realised - as it is in the classroom - and it is then a
matter of interpretation for both the analyst and the co-participants
to determine whether support has in fact been given.

Conversational Exchanges

These Exchanges begin with an Initiation which may be either an
Opening, or a Re-Opening or a Challenging Move. They may be followed
by one or several Supporting Moves, and may then be followed by a
Bound-Opening, which may itself be Supported one or several times,
after which Bound-Openings may recur together with recursive Supports.

Transactions

Since Transactions either begin with Frame, Focus, or an Opening Move,
the recognition criteria for Transaction boundaries are the same as
those for the beginnings of these Moves. It might be useful, however,
to repeat them here.

1. __Frames__

   The presence of a Marker or a Summons, together with silent stress.

2. __Focusses__

   The presence of Metastatement (which may be a request for speaker's rights) or a Conclusion. The optional use of Marker or Summons preceding this, and the optional use of a Starter immediately before the Metastatement or Conclusion.

3. __Opening Moves__

   The presence of an Informative, Elicitation, Directive or Accusation with no anaphoric referent in the preceding utterance. This may be preceded by Marker or Summons, and/or Starter, and may of course be followed by Comment or Prompt.

Transactions themselves are made up of an optional Explicit Boundary Exchange, a compulsory Conversational Exchange with an __Opening__ Move as Initiator, and unordered sequence of Conversational Exchanges with Bound-Openings, Re-Openings and Challenges as their Initiators.

At present I see no need for a two-order distinction of both Transaction and Sequence between the ranks of Exchanges and Inter-action, as used in the later stages of the Birmingham project work. I suspect that in the data studied then, there was a confusion between sections of the discourse marked as sets of Exchanges and called "Sequences", and somewhat larger units, also marked as sets of Exchanges but called "Transactions". The units labelled "Transactions" also correspond to a common-sense notion of pre-planned divisions of talk and time. In the classroom, for example, the teacher has some sort of lesson-plan, for committee talk there is an agenda, for the doctor-patient interview, there is a standardised strategy for doing the job - discovering what is wrong with the patient and making suggestions for putting it right, and in media discussions, all parties are briefed as to how the time can best be used to inform and entertain the audience, and the Chairman at least will do his best to ensure that the participants keep to this brief. If this distinction is valid, it would perhaps be appropriate to label the sections of my discourse which lie between Interaction and Exchange, as "Sequence", leaving the notion of Transaction to correspond with pre-planned activity that occurs in institutionalised situations. However, given the rather vague reference of the term, and the unfortunate confusion with Brazil's notion of "pitch-sequence" in discourse intonation, (Brazil forthcoming), I have continued to use the term "Transaction" for the time being.

4. A formal description of the rank scale

I here follow the lay-out used in Sinclair and Coulthard.

Rank I: Interaction

Elements of Structure	Structures	Classes of Transaction
	An unordered string of Transactions	

Rank II: Transaction

Elements of Structure	Structures	Classes of Exchange
Preliminary (P)	$(P)O(C(R)^n)^n$	P: Explicit Boundary
Opening (0)		0: Conversational with Opening as Initiator
Challenging (C)		C: Conversational with Challenge as Initiator
Re-Opening (R)		R: Conversational with Re-Opening as Initiator

Rank III: Exchange (Explicit Boundary)

Elements of Structure	Structures	Classes of Move
Frame (Fr)	$(Fr)(Fo)S*$	Fr: Framing
Focus (Fo)		Fo: Focussing
Supporting (S)		S: Supporting

Rank III: Exchange (Conversational) - Opening, Challenging, Re-Opening

Elements of Structure	Structures	Classes of Move
Initiation (I)	$I(R(I^r(R)^n)^n)^n$	I: Opening or Challenging or Re-Opening
Responses (R)		R: Supporting
Re-Initiation (I^r)		I^r: Bound-Opening

Rank IV: Move (Framing)

Elements of Structure	Structures	Classes of Act
head (h)	hq	h: Marker or Summons
qualifier (q)		q: Silent Stress

Rank IV: Move (Focussing)

Elements of Structure	Structures	Classes of Act
signal(s)	(s) (pre-h)h(post-h)	s: Marker or Summons
pre-head(pre-h)		pre-h: Starter
head(h)		h: Metastatement or
post-head(post-h)		Conclusion
		post-h: Comment

Rank IV: Move (Opening)

Elements of Structure	Structures	Classes of Act
signal(s)	(s) (pre-h)h(post-h)	s: Marker or Summons
pre-head (pre-h)		pre-h: Starter
head (h)		h: Informative or
post-head (post-h)		Elicitation
		or Directive
		or Accusation
		post-h: Comment
		or Prompt
		or Clue

Rank IV: Move (Supporting)

Elements of Structure	Structures	Classes of Act
pre-head(pre-h)	(pre-he)h(post-h)	pre-h: Accept
head (h)		h: Acknowledge
post-head (post-h)		or Reply
		or React
		or Excuse
		post-h: Comment

Rank IV: Move (Challenging)

Elements of Structure	Structures	Classes of Act
pre-head(pre-h)	(pre-h)h(post-h)	pre-h: Starter or
head (h)		Preface
post-head (post-h)		h: Informative
		or Elicitation
		or Directive
		or Accusation
		post-h: Comment
		or Prompt

Rank IV: Move (Bound-Opening)

Elements of Structure	Structures	Classes of Act

pre-head(pre-h)
head(h)
post-head(post-h)
	(pre-h)h(post-h)	pre-h: Starter
		      or Preface
		h: Informative
		   or Elicitation
		   or Directive
		   or Accusation
		post-h: Comment
		       or Prompt

Rank IV: Move (Re-Opening)

Elements of Structure	Structures	Classes of Act

pre-head(pre-h)
head(h)
post-head(post-h)
	(pre-h)h(post-h)	pre-h: Starter
		      or Preface
		h: Informative
		   or Elicitation
		   or Directive
		   or Accusation
		post-h: Comment
		       or Prompt

Summary of the Acts

Label	Symbol	Realisation and Definition
marker	m	Realised by a closed class of items - "Well", "OK", "Now", "Good", "Alright", and expressive particles, eg. "Kaw", "Blimey". Its function is to mark boundaries in the discourse and to indicate that the speaker has a topic to introduce.
summons	sum	Realised by a closed class of verbal and non-verbal items - the use of the name of another participant, or mechanical devices like door bells, telephone bells, etc. Its function is to mark a boundary in the discourse, and to indicate that the producer of the item has a topic to introduce once he has gained the attention of the hearer.
silent stress	∧	Realised by a pause, indicated in the text by either an exclamation mark, or a stage direction following a Marker. It functions to highlight the Marker or Summons when they act as the head of a Boundary Exchange.

starter	s	Realised by a statement, question, command or moodless item. Its function is to provide information about, direct attention to, or thought towards an area, in order to make a correct response to the coming Initiation more likely.
metastatement	ms	Realised by a statement, question or command which refers to a future event in the ongoing talk, or a request for speaker's rights. Its function is to make clear the structure of the immediately following discourse, and to indicate the speaker's wish for an extended turn.
conclusion	con	Realised by an anaphoric statement, which can be seen as the complement to metastatement, in that its function is to make clear the structure of the immediately preceding discourse.
informative	i	Realised by a statement whose sole function is to provide information. The appropriate response is the giving of attention and indication of understanding.
elicitation	el	Realised by a question. Its function is to request a linguistic response. Occasionally it may be realised by a command requesting a linguistic response.
directive	d	Realised by a command, and functions to request a non-linguistic response.
accusation	accn	Realised by a statement, question, command or moodless item. Its function is to request an apology or a surrogate excuse.
comment	com	Realised by a statement, question or command, or moodless item, and functions to expand, justify, provide additional information to a preceding Informative or Comment.
accept	acct	Realised by a closed class of items - "yes", "OK", "uhuh", "I will", "no" (where the preceding utterance was negative). Its function is to indicate that the speaker has heard and understood the previous utterance and is compliant.
reply	rep	Realised by statement, question, moodless items and non-verbal surrogates such as nods. Its function is to provide a linguistic response appropriate to a preceding elicitation.

react	rea	Realised by a non-linguistic action. Its function is to provide an appropriate non-linguistic response to a preceding directive.
acknowledge	ack	Realised by "yes", "OK", "uhuh" and expressive particles. Its function is to show that an Informative has been understood, and its significance appreciated.
excuse	ex	Realised by a formulaic apology, or a statement or moodless item which substitutes for an apology, and is thus heard as an excuse. Its function is to provide an appropriate response to a preceding accusation.
preface	pr	Realised by combinations of placement markers, self-referential meta-terms and meta-reference to preceding talk. Its function is to show that a diverted topic is being re-introduced.
prompt	p	Realised by a closed class of items - "go on", "what are you waiting for", "hurry up". Its function is to reinforce a preceding directive or elicitation.
evaluate	ev	Realised by a statement, question, command or moodless item. Its function is to comment on the appropriateness of a preceding utterance.

5. Examples of coded data

The following coded sheets take the first ten Transactions of Pinter's The Dumb Waiter. Whilst it was not possible to find a reasonably-sized selection that would demonstrate all the coding categories, I think that this piece contains a representative sample of problems, and will, I hope, serve to clarify my approach to the data in general.

It will be obvious that I am, of course, coding only one interpretation of the text, and, as we do not have precise information about the intonation patterns here, many utterances are necessarily ambiguous. Where stage directions are relevant they are included to substantiate this interpretation, but otherwise, I have had to make decisions about what is happening in the text in the same way that actors or directors would have to do. For example, in Transaction 1, I have coded utterances 13-21 as Supporting items, "hearing" them as expressing interest or fascination in the news story rather than simple disbelief. It would, of course, be possible to take this latter view, in which case, some of Gus's utterances would be coded as Challenges, and the subsequent analysis contour would look very different. I do not want to dwell on this issue here, though it is interesting to observe how some writers give explicit clues for their interpreters, and some give no hints at all. This means of course that there are differing amounts of freedom of interpretation available in different texts, and the descriptive apparatus is one way of showing exactly what happens to the network of choices available, once a single item is realised in different ways. For the present purpose of this paper, I ask only that you see my coding as a reasonable and possible interpretation of the words in the text - not as the only analysis.

FOOTNOTE

* That is, either <u>Fr</u> or <u>Fo</u>, but at least one must be chosen.

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Trans 1,2	Challenging Move	Act	Opening Move	Act	Supporting Move	Act
BOUNDARY		1	B) Kaw! FRAME	m+ Λ		
OPENING		2	What about this?	s		
		3	Listen to this!	s		
		4	A man of 87 wanted to cross the road	inf		
		5	But there was a lot of traffic see	adv 4		
		6	He couldn't see how he was going to squeeze through	add 5		
		7	So he crawled under a lorry	cau		
CHALLENGE 8	G) He what? (KS2)	el				
RE-OPENING		9	B) He crawled under a lorry	rep		
		10	A stationary lorry	qual 9		
		11			G) No?	ack
BOUND OPENING		12	B) The lorry started and ran over him	add 7		
		13			G) Go on!	ack
		14			B) That's what it says here	com
		15)			G) Get away!	ack
		16)			B) It's enough to make you want to puke isn't it?	ack
		17			G) Who advised him to do a thing like that?	ack
		18			B) A man of 87 crawling under a lorry	repeat 4+7
		19			G) It's unbelievable	ack
		20			B) It's down here in black and white	com
		21			G) Incredible	restate 19
BOUNDARY		1	FOCUS G) I want to ask you something	ms		
CHALLENGE	B) Ø(KS1)					

Trans 3,4	Challenging Move	Act	Opening Move	Act	Supporting Move	Act
OPENING		1	B) What are you doing out there?	el 2	G) Well I was just -	rep
BOUND-OPENING		3	B) What about the tea?	el 4	G) I'm just going to make it	rep
BOUND-OPENING		5	B) Well go on, make it	dir 6	G) Yes, I will	acct
OPENING		1 2 3 4	G) He's laid on some very nice crockery this time I'll say that It's sort of striped There's a white stripe	inf com 1 qual 1 qual 3		
CHALLENGE 5	(Ben reads) (KSI)					
RE-OPENING		6 7	G) It's very nice I'll say that	restate 1 repeat 2		
CHALLENGE 8	(Ben reads) (KSI)					
RE-OPENING		9 10 11 12 13 14 15	G) You know sort of round the cup Round the rim All the rest of it's black you see Then the saucer's black except for right in the middle where the cup goes where it's white	qual 4 qual 9 qual 13 + 14 rest 11 qual 12 rest 13 rest 12 + 13		
CHALLENGE 16	(Ben reads (KSI)					
RE-OPENING		17 18 19 20 21	G) Then the plates are the same you see only they've got a black stripe - the plates right across the middle Yes, I'm quite taken with the crockery	add qual 17 repeat 17 qual 18 rest 1		

Trans 4 5, 6, 7	Challenging Move	Act	Opening Move	Act	Supporting Move	Act
CHALLENGE 22 23	B) What do you want plates for? You're not going to eat	el com				
CHALLENGE 24	G) I've brought a few biscuits (L5)	rep				
CHALLENGE 25	B) Well you'd better eat them quick (L6)	dir				
RE-OPENING		26 27 28	G) I always bring a few biscuits Or a pie You know I can't drink tea without anything to eat	inf qual 26 com		
CHALLENGE 29 30	B) Well make the tea then will you (L7) Time's getting on	dir com				
OPENING		1 2	G) You got any cigarettes I think I've run out	el com		
CHALLENGE 3	B) Ø (KSI)					
OPENING		1	G) I hope it won't be a long job this one	inf		
CHALLENGE 2	B) Ø(KSI)					
BOUNDARY CHALLENGE 3	 B) Ø(KSI)	1 2	FOCUS G) Oh I wanted to ask you something	m ms		

Trans 8, 9	Challenging Move	Act	Opening Move	Act	Supporting Move	Act
BOUNDARY		1	FRAME B) Kaw!	m+ 2	G) What's that,	acct
OPENING		3	B) A child of 8 killed a cat	inf 4 5 6 7	G) Get away B) It's a fact What about that eh? A child of 8 killing a cat	ack com 3 ack rest 3
BOUND- OPENING		8	G) How did he do it?	el		
CHALLENGE 9	B) It was a girl (L10)	Inf				
RE-OPENING		10	G) How did she do it?	rest 8 11	B) She -	rep
CHALLENGE 12	B) It doesn't say (L12)	Inf				
CHALLENGE 13	G) Why not? (L6)	el				
CHALLENGE 14	B) Wait a minute (L14)	dir				
RE-OPENING		15	B) It just says Her brother, aged 11, viewed the incident from the woodshed	inf 16	G) Go on!	ack
CHALLENGE 17	B) That's bloody ridiculous! (L6)					
RE-OPENING		18	G) I bet he did it	inf		
CHALLENGE 19	B) Who? (KS3)	el				
RE-OPENING		20	G) The brother	rest 18 21 22 23 24	B) I think you're right What about that eh? A kid of 11 killing a cat and blaming it on his little sister of 8 It's enough to -	ev ack rest 3/15 com

Trans 10	Challenging Move	Act	Opening Move	Act	Supporting Move	Act
OPENING		1	G) What time is he getting in touch?	el		
CHALLENGE 2	(Ben reads) (KS1)					
RE-OPENING		3	G) What time is he getting in touch?	rep-eat 1		
CHALLENGE 4 5 6	B) What's the matter with you? (L10) It could be any time Any time	s rep 3 rep-eat 5				

REVIEW of Kenneth MacKinnon Language, Education and Social Processes
in a Gaelic Community, London: Routledge
& Kegan Paul, 1977.   Ppxii + 222, £4.75

An increasing amount of British sociolinguistic work is now becoming
available, including Trudgill's recent edited collection of papers
on British English, Macaulay's book on Glasgow (both also reviewed
in this edition of NLC), work by the Milroys on Belfast, work on
Jamaican Creole in Britain by Jim Wight and Viv Edwards, and so on.
It is good now to be able to teach courses on sociolinguistics which
are not based entirely on the Subanun, diglossia in Arabic or Black
English Vernacular in New York!

MacKinnon's book is particularly welcome as an account of language
shift and language maintenance in the Outer Hebrides. As he points
out (4), Scotland is pretty well terra incognita for sociologists in
general, presumably on the dubious assumption that Britain is a
homogeneous society, and that field work may therefore just as well
be done around London! But the Scottish Outer Isles are very unlike
most of the rest of Britain. They comprise rural crofting and
fishing communities, with no true middle class; there is little
economic development; unemployment, at over 25 per cent, is the
highest in Britain; there is high outward migration and late
marriage, leading to an unbalanced age and sex distribution in the
population; the society is male-dominated; and the people are
strongly religious, mainly Presbyterian and Calvinist, and rigour-
ously observant of the Sabbath.

MacKinnon's book is a study of Harris, the southern part of the main
island of Harris and Lewis. The total population of Harris is under
3000, with a school roll of under 500. So it is an ideal size for
traditional methods of data collection in a year's main fieldwork
which MacKinnon carried out.

The main part of the book is a straightforward sociology of language
account, packed with data on population, education, migration,
communications, questionnaire and interview findings on attitudes to
Gaelic, and observations about domains of language use for Gaelic
and English. The major fact to be explained is the remarkable
continued existence of a Gaelic-speaking community into the twentieth
century (5), despite hundreds of years of depopulation and increasing
pressure from English: the rate of language maintenance is over 90%
in some areas, and the language is regularly used, although there
are now few if any Gaelic monolinguals.

The major factors influencing language maintenance appear to be as
follows. Gaelic is maintained at the level of folk-life (7), where
it is the every-day language throughout the Outer Hebrides. It is
largely an oral medium, and although literacy in Gaelic is wide-
spread, there is little need to read and write Gaelic. Gaelic is
supreme in the Church, and the community is strongly church-going.
The relation between occupations and Gaelic is not simple (82), but
language maintenance is greatest in rural crofting and fishing
communities. The area is an 'educational backwater' and bright

children have to move away from the area, often never to return, to receive good secondary education: there is no university, college of education or higher education centre of any kind within the Highland counties (112). Ferry services to the Outer Isles have improved greatly since the mid-1960s (42), but the new services have had the paradoxical effect of breaking up the Gaelic-speaking areas: the routes run mainly East-to-West, connecting the Islands to the mainland, and bringing in thousands of tourists each year.

As for domains of use, Gaelic is the language of traditional and native institutions (home, local shops, post office), and English is the language of public affairs (officialdom, education, law). Even in the schools, the official language is English, and Gaelic is often just a subject on the curriculum, on a par with geography or mathematics (101). However, it is important to note that (in contrast to Wales) there is no political activism associated with language questions. Much of the local committee structure, for example, is run by English-speaking incomers, and local norms of politeness do not require them to learn Gaelic. Notices in shops, even advertising local events, are in English, to cater for the percentage of Gaelic speakers who do not read Gaelic. (In the whole of the Highlands and Islands, I have only ever noticed two bilingual road signs, one outside Portree (Port-righ) on Skye, but on one side of the town only!) Gaelic has no official status in Scotland (contrasting with Welsh and Irish), and it was not until 1974 that the Scottish National Party adopted a resolution to formulate a detailed policy for Gaelic (2).

Finally, a few minor critical comments. First, the book is a revised PhD thesis, and this shows. It is rather repetitive and not very well written. Along with the extremely valuable data on language maintenance, are some oddly intrusive and unintegrated sections, including: occasional and very limited information about the language itself; occasional references to Gaelic and Whorfian world views; and occasional unconvincing attempts to relate the language use to the question of elaborated and restricted codes. (Bernstein has written a half-page Foreword to the book).

Second, it would have been valuable to have been given comparative data on language maintenance on the other Scottish islands, especially, for example, Barra, also in the Outer Hebrides, but which is Catholic. Stephens(1976) now contains useful rough statistics on Welsh, Irish and Breton, but only very approximate statistics for Gaelic in Scotland.

Third, given the nature of the community, in which incomers rarely learn the language, and where there are sharp discontinuities between English and traditional Gaelic society, it would have been useful to know whether MacKinnon is a native speaker of Gaelic. We know from an anecdote (55) that he speaks the language, although the anecdote shows him committing a social blunder by using Gaelic in an inappropriate social situation. The fieldworker's communicative competence could be crucial to the data collected in such a community.

Finally, the book begins and ends, pseudly, with untranslated Gaelic. The sentence at the beginning appears merely to be an acknowledgement for help received during the preparation of the book. But my copy of Teach Yourself Gaelic is unable to cope with the very last sentence of the book, for which I would welcome a translation from readers, and we are left frustratingly with this (192):

'The final word must be left with the Gaels themselves: Is e beul a labhras, ach is e gnìomh a dhearbhas!'

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REVIEW of Peter Trudgill, ed.   Sociolinguistic Patterns in British
                                English, London: Arnold, 1978.
                                Pp186, £9.95

    R.K.S. Macaulay   Language, social class and education:
                                a Glasgow study, Edinburgh: Edinburgh
                                University Press, 1977. Ppviii + 179,
                                £4.50

The Trudgill book (T) is lovely to look at and extremely expensive.
Macaulay (M) has smaller type and is quite a strain to read, although
more acceptably priced. The dilemma is acute.

T, a collection of papers, is valuable on a number of levels. It is
a mine of information, often unsuspected or only half-suspected,
within a topic underrepresented hitherto in British linguistics. It
is a winner, therefore, in terms of the sheer fascination of its data.
Further, with its reliance on the quantitative techniques developed
in American urban sociolinguistics (NB its relation to the title of
Labov 1972), it is a useful complement to the traditional dialecto-
logical approach with its rural and antiquarian bias. Indeed, the
article by Douglas-Cowie takes the new techniques back into the
traditional sphere by analysing code-switching in a rural (although
dormitory) community. Finally, the average quality of the papers in
it is high.

Trudgill himself provides a very useful introduction (T1-18) to the
various disciplines which uncomfortably share the label 'socio-
linguistics'; the section should be required reading for orientation
sessions at the beginning of undergraduate sociolinguistics courses.
It tacitly points out that the paper by Elyan et al. (T122-131) is a
misfit in the book, being pure experimental social psychology rather
than linguistic sociolingustics. Carping would be unhelpful, though,
as its findings on the perception of accent are reflected in other
ways elsewhere in the book and in M75-130. The editor also gives
a rundown of the themes emerging in the papers, so I refer the reader
to T17-18 and shall be selective. Picking out certain points and
themes may be invidious, and in any case subjective, but the following
points seem to me to be the most interesting to emerge.

From the point of view of data, Romaine demonstrates unsuspected
variation in word-final /r/ in Edinburgh (T144-57), and Cheshire
(T52-68) shows the social and historical significance of tense-
marking variation in Reading. Methodologically, Reid (T158-72),
through an admitted flaw in experimental design, shows how variation
that is inherent may be supplemented from outside the geographically
expected repertoire (such as that analysed in detail in M25-56) by
informants adopting a certain persona complete with segmental and
prosodic and paralinguistic features. Is this the use of a stereotype,
or the use of a domain-restricted variant (cf Denison 1972)? The
theoretical framework either needs tightening here, or needs to have
a certain vagueness justified theoretically. Reid has another
interesting methodological point: for some informants the interview

situation holds more terrors than for others (T164), and consequently
it cannot be held to be an absolute determinant of situational formality.
The performance of Reid's Edinburgh schoolchildren with interviewers
and radio microphones contrasts oddly with the thrust of M84-136 on
Glaswegian verbal reticence, which may be of cultural origin (cf M97,
and other places). The role of the perceived status of the analyst
is treated also by Douglas-Cowie (T39 ff); and Knowles (T82) high-
lights possible analyst interference with the data even outside the
interview situation (cf more generally T76 and Andersen, 1972: 16-7).
Milroy and Milroy (T19-36) concentrate on the determining effect on
variables of social networks, implying as it were an intra-class
hierarchy of groups and perhaps even perceived mobility boundaries
at thresholds (cf Fischer's comment on Bright and Ramanujan's (1972)
work on caste behaviour). The potential independence of working-
class speech norms from 'standard' forms is also treated implicitly
or explicitly by Romaine loc. cit., Cheshire loc. cit. and Macaulay
(M28ff, T139). However, classical hyper-behaviour does still crop
up, cf Pellowe and Jones's (T110-1) data on certain male informants'
superstandard percentage usage of falling intonation patterns in
Geordie.

This potential independence of working-class norms implied by several
investigators prompts speculation on the nature of the 'standard'
English speaker. Trudgill (1974: 19) excludes phonological points
from the definition of the standard, a point rejected by M71ff.
Macaulay is surely right in one sense; the very existence of hyper-
behaviour from certain phonological conversion rules necessarily
implies the existence of norms, and the social direction of the
conversion rules reveals integrative behaviour of quite distinct
types. 'Downward' conversion is a marker of integration into local
communities and acceptance of values proper to such; 'upward'
conversion is a marker of integration (actual or desired) into
supralocal 'communities' with broader-based value systems. It is
not a mark of the reviewer's middle-class prejudice to point out that
the character of 'downward' conversion depends on the local character-
istics of the highly various basilects; that of 'upward' conversion,
even if only to regional norms and not to RP, will have directionally,
relatively speaking, some general acrolectal features. If 'standard'
is taken, not very controversially, to mean 'supralocal', then we may
obviously talk about trends towards standard pronunciation, even if
we cannot identify an absolute target acrolect. Further, the linguistic
self-hatred of speakers of Glaswegian suggests that speakers' overt
language attitudes respond to a social reality, namely middle-class
linguistic values, whether these are pernicious or not; the fact
that northern dialects are admired above their own, and that these
are unlike urban English dialects or RP, is negative recognition of a
pronunciation standard. Southern English is after all part of most
Glaswegians' passive repertoire, and the well-socialised prejudice
in its favour is not a factor to be ignored. Following Macauley (M71),
we cannot absolutely categorise speakers as standard or not, but we
can tell quantitatively whether they standardise for certain features.
I take standard, then, to be a set of directions or trends, socially
approved, and whose meaning is socialised. That these are not necessarily

the forms used by the top dogs is implicit in Macaulay's own recognition test data; some speakers ranked by non class I informants as 'class I' are correctly recognised by class I informants as of some other status (M75-83). Class I 'know their own', but all can read the social meaning implicit in standard-ising. To talk of 'Standard English' accepts the reality of the prejudice and acknowledges it as a force. In another sense Trudgill is right: there are no standard speakers; only people who variably standardise. Where variability approaches zero for some marker, both on an index scale, and in degree or percentage sense, we have the greatest standardisation - in a standardised speaker. What I am suggesting here is not a theoretical absolute; here I have spoken of a normative direction for pronunciation; one could imagine a normative degree of stylistic shifting. One might imagine a categorical style-shifting in a speaker using [M] for (Wh) in formal styles and [W] in informal ones, if styles were susceptible of absolute distinction. Compare the categorical variation in (j) between [j] and [∅] in Cambridge, between wordlist style and casual speech (Powell 1977: 10-1). Different tactical responses in speakers to the strategy of standardising are shown in the very important paper by Trudgill and Foxcroft (T69-79). Transfer from one lexical set to another may be used, or approxi-mation of the extreme phonological values for the pair of lexical sets. In Trudgill and Foxcroft's case, the first tactic seems to be a working class one, the second a middle class one. This potentially fruitful dichotomy should be pursued to determine the logically possible set of tactics and their relation to those actually occurring. (For work on individual tactics in morphology, see Coates, forthcoming.)

The ultimate foundation for sociolinguistic analysis is the behaviour of individuals, and, following criticism of standard procedures (eg Berdan 1975), Macaulay usefully pinpoints the range of variation by individuals over a set of values as being a possible identifying variable in itself (both in T and M). A drawback is the possibility of analyst interference in the case of index-assignation to nondiscrete variables, as Knowles (T81-2) valuably points out. Knowles proposes the use of multidimensional directed scales rather than linear ones in the computation of variable values, a point that accords well with the views on standardisation expressed above. Final realisation points are essentially arbitrary; as Knowles puts it (T83):

'Surely ... speakers know how to modify their [ʊ] [in the cases under discussion, RC] without being quite sure what to modify it to.'

This does not contradict the approximative type of change referred to by Trudgill and Foxcroft, with the exception that in their vowel merger cases, the extreme distinct ends on the scale form a nec plus ultra for the directionality.

Absence of discussion of other papers is not to belittle them; all are interesting from the point of view of data, methodology, inter-pretation or wider implication.

Some issues arising from M have already been discussed. The author's concerns emerge as sympathetic and humane, concerned as he is with the alleviation of linguistic disadvantage, in the tradition of Barnes (1971), Rosen and Rosen (1973), Bullock (1975), etc. All these writers emphasise the existence of a 'school register', a language of education over and above subject-specific terminology (cf also Cormack 1978). M is not anxious to stress the value of middle-class code features as such in the education system, but to emphasise to the child the value of code-switching. Speech differences are to be discussed with children, to make available

'more precise information about the kinds of features that distinguish dialects.'

for

'any pupils who may wish at some later date to modify their speech in the direction of a more prestigious variety' (M144)

The aim is to bring the child's communicative competence to the level of conscious analysis and so minimise the risk of its being restricted by pressures applied from without. M's work underlines that children appear to embed themselves in an attitudinal frame-work in their early teens, in the sense that they seem to offer primary allegiance either to a local code or to a repertoire crossing the symbolic mobility threshold. The role of ambition, self-identity is stressed here (M57-67), as by Douglas-Cowie in the Trudgill volume (T37-51); M is in effect advocating a policy of helping the child keep his social options open, and by improving his oracy skills to minimise the chance of his later rejecting the 'school register'. (M believes emphasis on oracy to be a special need in Glasgow, for specifically local cultural reasons.)

M provides an overview of teachers' and employers' attitudes to language, a great deal in their own words. The upshot is that their least requirements could be met by the type of repertoire flexibility that M advocates striving for; specifically Glasgow features should not be killed off in the individual for the sake of doing so.

The verbatim transcripts are not always easy to read and one occasionally wishes for a little judicious editorial work on them.

Despite M's warnings and disclaimers about a possibly biased sample, here and in T, his work reveals consistent individual and group trends in Glasgow speech and he validates his claim of the existence of three psycho-social classes in the Glasgow situation, both from the lingustic and the overt attitudinal evidence. Comparative work would be useful, on the lines that the Bristol social psychologists have established for perception of sex (T122-31), nationality (Bourhis et al. 1973), personality (Giles 1972) and so on.

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<u>NLC 6.2. October 1977.</u> Special issue on Child Language; articles by Bruner & Ratner, Gopnik, Wells and others.

<u>NLC 6.1. May 1977.</u> Special issue on Stylistics.

<u>NLC 5.2. October 1976.</u> Includes a four-articles debate between Radford and Pullum on the verb-auxiliary distinction in English.

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NLC 11.1. June 1982. Ritchie (computational linguistics); Killingley (Cantonese classifiers); Davies (verbal interaction).

NLC 10.2. December 1981. Special issue on Varieties of English. Includes: Harris (on directives in court discourse); Hudson (on wanna and the lexicon); Kirk (on Scottish Non-Standard English); Lander (on the English of British-born children of Caribbean immigrants).

NLC 10.1. June 1981. Special issue on Text and Discourse. Powell (on speech act theory); Carston (on irony and parody); Berry (on exchange structure); Nash (on narrative); Wilkinson (on children's writing).

All other back issues, from 1971, are still available, including:

NLC 9.2. December 1980. Special issue on Syntax and Semantics. Wales (on the pronoun 'one'); Killingley (on Cantonese); Stubbs & Berry (on English verbal groups); Durkin (on English prepositions).

NLC 9.1. June 1980. Includes: Cheshire (on non-standard English); Pincas (on teaching English); Pountain (on teaching Spanish); Walker (on Frisia).

NLC 8.2. December 1979. Includes J. Coates (on computational linguistics); Connolly (on language change); Foster (on child language); Richardson (on discourse).

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NLC 7.1. August 1978. Special issue on Phonetics and phonology.