

Figure 2.8 Synoptic Representation Of The Textual Structure Of The Foot

The textual structure of the foot is a view of rhythm as a process of periodically switching on stress. Just as the moraic wave is not a derivative phenomenon resulting from segmental organisation but is the principle of their organisation, stress does not result from the varying degrees of prominence carried by the successive syllables, but is an organising principle of the rhythmic field. Catford (1988: 345):

It is the stress-contour of the foot that imposes different degrees of stress upon successive syllables it dominates, according to their location within the foot.

According to Catford (1977: 92), the organic-aerodynamic correlate of stress is initiator power, which is the product of initiator velocity, the rate of initiatory volume change, and the pressure load against which the initiator is acting. Catford (1988: 346):

The foot is a unitary quantum of 'vocal effort', that is, of *initiator power*...the product of initiator velocity and the pressure-load imposed by the air driven forward by the initiator, or, more simply, for voiced sounds it is the volume-velocity of transglottal airflow times subglottal pressure.

A syllable that is produced with stronger initiator power (stress), during the Ictus phase of the foot, can be described as [salient]. Other syllables, which are realised with less intensity and duration than [salient] syllables due to the weaker initiator power entailed in their enactment, can be described as [weak]. The faster rate of [weak] syllables may result in underarticulated targets (Ohala 1989: 179) such as reduced aspiration, reduced posture and aperture distinction (obscure vowels) or reduced closure (lenited consonants).

The view of rhythm as a process of periodically switching on stress can be complemented with a view of rhythm as modification, rhythm being the modification of articulation by initiator power. Recalling from above, modification is a component of the univariate structures that realise the logical metafunction, being hypotactic interdependency, the relation between two elements of unequal status, as between a dependent *Modifier* and the dominant *Head* which it modifies, and is indicated by Greek letter notation: $\alpha \beta \gamma$.

Viewed in terms of interdependency, the foot is a hypotactic nexus $\alpha^{\wedge}\beta$, with the Remiss dependent on the Ictus. The Ictus is the dominant (α) phase of the foot: it is both the necessary and sufficient phase of the foot. There must be an Ictus for there

to be a foot. The Remiss is the dependent (β) phase of the foot: its presence implies the presence of a Ictus. This view of the foot is represented below.

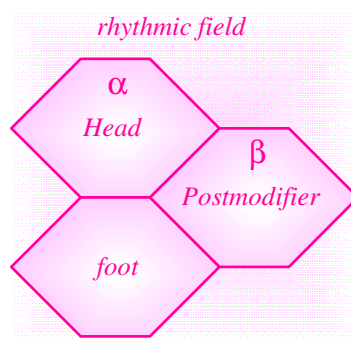


Figure 2.9 The Logical Structure Of The Foot: Ictus^Remiss As Nexus Of Postmodification

There can be further postmodifications by subsequent [weak] syllables in the Remiss — that is, the foot can comprise more than one [weak] syllable — but since all variation on this simple structure is claimed to be demarcative in function, such structures will be left to the following discussion on rhythmic cohesion.

2.2.2 Cohesion Around The Foot Periphery

In Chapter 1, it was proposed that rhythmic potential varies with lexicogrammatical position, such that some paradigmatic states and syntagmatic structures signal specific lexicogrammatical domains. The function of such phenomena was interpreted as cohesive, in that cohesion is the process of expressing, by rhythmic means, the syntagmatic extent of lexicogrammatical rank units such as morphemes, words, groups or phrases and clauses. Rhythmic cohesion is a *resource* for tracking the lexicogrammatical progression of the text. This discussion will relate the resources of rhythmic cohesion to the rhythmic field, focusing on the demarcation of lexicogrammatical initiality and finality.

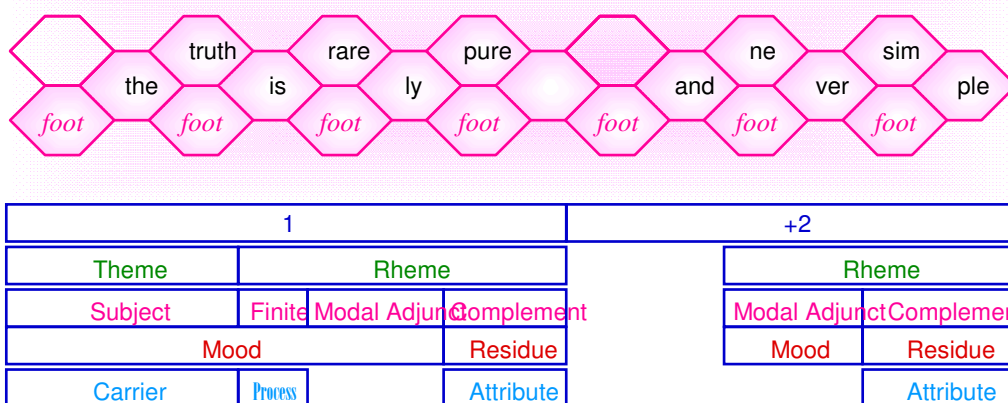
Demarcation is effected by phonological phenomena that do not have general lexicogrammatical distribution, but only occur at lexicogrammatical boundaries. In the previous chapter, two demarcative resources were identified for English rhythm. Lexicogrammatical initiality was said to be indicated by an incomplete foot, that is a foot with a silent beat or 'empty' Ictus phase. Lexicogrammatical finality was said to be indicated by an 'empty' Remiss or a foot with only an Ictus. In the following discussions, these two cohesive resources will be related to the structure of the rhythmic field, and supplemented with two further means of rhythmically delineating lexicogrammatical boundaries.

2.2.2.1 Demarcation Through (Paradigmatic) Omission

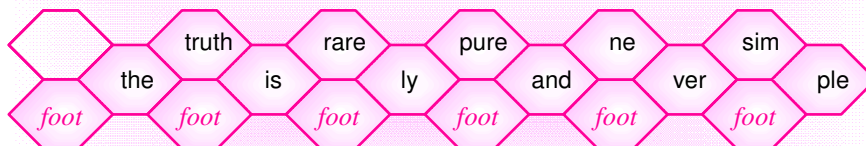
There are two ways of rhythmically demarcating lexicogrammatical boundaries through paradigmatic omission in English: the silent beat, or empty Ictus, and the empty Remiss. These positions are empty in the sense that they are not charged with paradigmatic states. Each resource will be discussed in turn.

2.2.2.1.1 ‘Empty’ Ictus: Lexicogrammatical Initiality

In the previous chapter, a foot with a silent Ictus, an absent Ictus syllable, was shown to probabilistically demarcate lexicogrammatical initiality. This can be illustrated here by the rhythmic field¹ of / the / truth is / rarely / pure / and / never / simple /, where the two silent beats are indicated below by empty transparent peaks.



In the above paratactic clause nexus, the initiality of the first clause the truth is rarely pure is signalled by the first empty Ictus, marking the initiality of the Theme/Subject/Carrier the truth, while the second empty Ictus signals the initiality of the second clause and never simple, in which the Mood element the truth is has been ellipsed. In the following alternative instantiation, only the initiality of the Theme/Subject/Carrier of the first clause is demarcated.

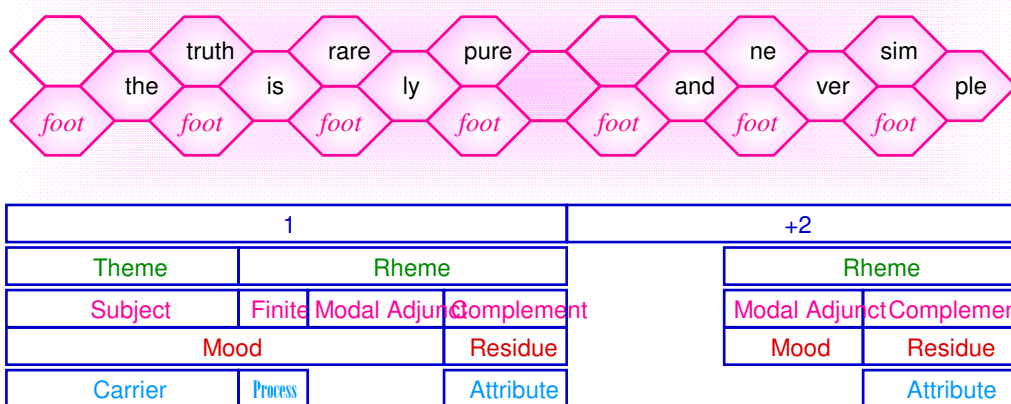


¹ From *The Importance Of Being Earnest: A Trivial Comedy For Serious People* by Oscar Wilde, as spoken by the actor Jeremy Clyde in the rôle of Algernon Moncrieff in a BBC Radio production directed by Ian Cotterill.

2.2.2.1.2 ‘Empty’ Remiss: Lexicogrammatical Finality

Also in the previous chapter, a foot with an absent Remiss syllable was shown to probabilistically demarcate lexicogrammatical finality. Phonetically, an empty Remiss entails a sustentation during the enactment of the preceding Ictus, so that the Ictus syllable endures longer than a [salient] syllable in a foot with a Remiss. In other words, an empty Remiss reflects the fact that a syllable in a *monosyllabic* foot tends, in languages like English, to be longer in duration than the same syllable in a *polysyllabic* foot, whether [salient] or [weak].¹

This demarcative resource can also be illustrated by the rhythmic field of / the / truth is / rarely / pure / and / never / simple / where the absent Remiss syllable after pure is indicated below by represented as empty and transparent.



In this instantiation, the finality of the Rheme/Complement/Attribute pure, and thus of the first clause of the clause complex, the truth is rarely pure, is signalled by the empty Remiss.

2.2.2.2 Demarcation Through (Syntagmatic) Addition

There are two ways of rhythmically demarcating lexicogrammatical boundaries through syntagmatic addition in English: *anacrusis*, the procliticisation of [weak] syllables to a following Ictus, and the encliticisation of [weak] syllables to a preceding Remiss. These will be discussed in turn.

2.2.2.2.1 Proclitic Cataphoric Phases: Lexicogrammatical Initiality

In Chapter 1, phonogenetic fields were described as vectorfields in which each point is characterised by a vector quantity that possesses both *magnitude* and *direction*. The magnitude of the rhythmic field is measured by waves of stress. Direction in the

¹ See, for example, Abercrombie (1965) and Halliday (1967: 12; 1970: 3; 1985b: 49-52; 1994: 292-4) on pedalian rhythm and the isochronicity of the English foot.

rhythmic field arises from the fact that the rhythmic field is polarised in one direction, along the time axis, and is therefore asymmetric in time. The biological basis of this is that the vocal tract functions asymmetrically in time, because speech is a process that primarily exploits *egressive* airstreams. The consequence of this is that initiating and terminating a foot are not equal rhythmic events, as Catford (1988: 346) has described:

The power-quanta, or stress-pulses, that constitute feet characteristically start with a *rapid* rise to a maximum followed by a *slower* decline, until the moment when the power build-up for the next foot begins.

The work of Cruttenden (1986)¹ suggests that [weak] syllables can be enacted during the rapid rise to the Ictus as well as during the slower decline that follows it. He points out that in the case of *anacrusis*,² the Pre-Ictal [weak] syllable is phonetically distinguishable from other [weak] syllables in terms of rate of articulation and in liability of articulatory reduction. Cruttenden³ (*ibid*: 24, 39):

The general tendency in English is to produce syllables in an anacrusis with greater speed than any unstressed syllables within following rhythm-groups; hence also such syllables are extremely liable to be reduced...The sudden acceleration...indicates that [such] syllables are anacrustic...⁴

Campbell (1990: 3; 1993: 80-1) similarly finds that Pre-Ictal [weak] syllables are shorter than other [weak] syllables:

[A]mongst the unstressed syllables, those in phrase- or clause-initial position with no leading stressed syllable are considerably shorter than equivalent ones following a stressed syllable in a foot...

The syllables in this group were also significantly shorter than those in the second shortest group 'unstressed three or more'.

Significantly, Campbell (1993: 80-1) also found that, unlike other [weak] syllables, the duration of Pre-Ictal [weak] syllables does not decrease as the number of syllables in the group increases:

No significant difference was found in the durations with respect to number of syllables in the group...Anacrusis therefore appears to be a valid distinction

¹ Cruttenden (*ibid*: 18) notes that in languages with fixed word-stress, 'stress takes on a strong DELIMITATIVE function', but maintains that languages like English, 'which have no fixed word-stress...hardly use word-stress in a delimitative way at all'. Here the claim is that the *absence of stress* potentially has a demarcative function.

² Anacrusis refers to 'an unstressed syllable or syllable group which begins a line of verse but is not counted as part of the first foot, which properly begins with a stressed syllable' (Macquarie Dictionary 1991: 58).

³ Cruttenden (*ibid*: 24-5, 39) takes anacrusis to be a boundary marker of the *intonation-group* rather than the foot, though he does note (*ibid*: 41) that 'both anacrusis and syllable lengthening may occur in positions other than at intonation-group boundaries'.

⁴ The "modulating" stress wave potentially affects the "carrier" moraic wave in that the syllables most likely to disappear phonogenetically and phylogenetically are those that are the quickest (presalient) and the weakest (most postsalient). A weak syllable between two strong syllables can satisfy both conditions, and may thus be doubly likely to disappear.

among unstressed syllables. The duration of other unstressed syllables, however, shortens as the number of syllables in the foot increases.

Weak syllables, therefore, potentially vary in *tempo*, with those enacted during the switching on¹ of stress being faster than those enacted during the switching off. On this basis, Cruttenden argues that, in an example from Halliday (1967: 19)

//1 this of course de/pends on the //1 country where they / live/

there are phonetic cues which suggest that a boundary occurs *before* the words on the, rather than *after* them, as the Halliday analysis would maintain.² Such a boundary suggests that these more rapid syllables should be regarded as part of the process of ‘striking up’ (anacrusis) to the following Ictus, and thus as a phase of that foot.

Accordingly, the position to be adopted here is that a foot may undergo additional *weak* phases before the Ictus, causing *syncopation* of the rhythm, in which the Ictus — or beat — falls on the second syllable of the foot. That is to say, a [weak] syllable may attach as a proclitic to a following Ictus.³ Before illustrating this approach, it is first necessary to reintroduce the notion of phoricity, first broached in the previous chapter.

Adapting Cruttenden’s position, it can be said that foot boundary positions, [weak] syllables, vary phonetically, with the faster — borrowing from musicology — [accelerando] proclitic syllables inclining forward in time in the direction of the vectorfield to the next Ictus, and other [weak] syllables, those [diminuendo] in the Remiss phase, inclining backward in time to the previous Ictus. This sense of direction in phonogenetic fields was modelled in Chapter 1 in terms of *phoricity*, and all boundary positions can be said to be potentially phoric. That is, boundary positions that incline forward in time to the next peak are termed *cataphoric* (□) in their reference — it is the rapid tempo of proclitic syllables that refers cataphorically to a following Ictus — and those that incline backward in time to the previous peak

¹ This is not to say that the rapid rise to the Ictus must be made during the production of a syllable. Stress differs from moraicity and tonicity in that it can be activated without phonation, so that there may be no syllable enacted during the power build up to the following Ictus.

² As this example from Halliday (1967: 19) is a constructed example introduced for the purposes of demonstrating a tonality contrast with a sentence in the data, Cruttenden is actually arguing about (what he assumes to be) the most typical instantiation of this sentence rather than Halliday’s data. Nevertheless, it does not falsify his claim that there are phonetic cues in English that suggest that some [weak] syllables should be analysed as anacrustic to the following ictus.

³ In the discussion on Irish initial consonant mutation (Chapter 4), it will be seen that the agents for mutation, mutagens, tend to be realised as [weak: accelerando] proclitic syllables, and the media of mutation, mutans, as [salient] syllables at the Ictus phase. Lexicogrammatically, these correspond to such configurations as preposition^nominal group, preposition^verbal group, and copula^nominal group. The consonant mutation functions cohesively — in the articulatory field — since it signals the integrity of a higher grammatical unit.

are termed *anaphoric* (); while those that are indeterminate or point in both directions are called *ambiphoric* ().¹

The phoricity of a boundary position assists in determining the location of foot boundaries, since cataphoric states are properties of foot initiality and anaphoric states are properties of foot finality, in contrast to ambiphoric states which are properties of both. The marking of a phase of the foot as cataphoric indicates that the foot boundary occurs *before* the first such syllable in that phase, while the marking of a phase of the foot as anaphoric indicates that the foot boundary occurs *after* the last such syllable in that phase.

The lexicogrammatical distribution of cataphoric phases of the foot is probabilistically associated with initial position, and so their function is to signal lexicogrammatical initiality. This demarcative resource can be illustrated by an instantiation of the rhythmic field² of / the truth is / rarely / pure / and never / simple / so that it is spoken without silent beats but with proclitic syllables indicating initiality.³ This is represented below, where [weak] phases are anaphoric unless indicated otherwise.



In this instantiation, the first cataphoric phase marks the initiality of the first clause the truth is rarely pure and of the Theme/Subject/Carrier the truth, while the second signals the initiality of the second clause and never simple, in which the Mood element the truth is

¹ Pre-ictal positions in a foot are in suspense cataphorically waiting for an Ictus, post-ictal positions are (anaphoric) resolutions.

² Henceforth, the Hallidayan notation for feet and tone groups will be adapted so that [salient] syllables are indicated by a single underline, and [tonic] syllables by a double underline.

³ The allowance for syllables proclitic to a foot has minor implications for the analysis of tone groups wherein the Tonic is preceded only by an incomplete foot — a silent Ictus with or without following weak syllables. An incomplete foot in such circumstances is analysed by Halliday (1994: 304) as proclitic to the Tonic, rather than as constituting a Pretonic segment. No Pretonic can exist in such tone groups because salient syllables are the necessary carriers of tone. By contrast, the present analysis allows that there may be no foot — complete or otherwise — before the Tonic, since weak syllables preceding the Tonic may be proclitic to the tonic foot. For example, a tone group that would be analysed by Halliday with the first foot proclitic to the Tonic // my / daughter's / coming to / see us // is analysed with the first syllable proclitic to the foot: // my daughter's / coming to / see us //. The two analyses agree in that neither ascribes a Pretonic segment to the tone group.

has been ellipsed for *grammatical* cohesion. Again, the finality of the Rheme/Complement/Attribute pure, and the first clause the truth is rarely pure, is signalled by the empty Remiss.

In the following instantiation (others are possible) of / in the land of / the blind / the one-eyed / man is / king /, the first cataphoric phase in the marks the initiality of the clause and of the prepositional phrase in the land of the blind functioning as thematic circumstantial Adjunct at clause rank; the second signals the initiality of the nominal group the blind functioning as Qualifier at group rank; and the third signals the initiality of the Rheme the one-eyed man is king and of the nominal group the one-eyed man functioning as Subject/Token at clause rank.¹

Here also, empty Remisses, as indicated by syllable lengthening during the Ictus phases blind and king, signal the finality of the thematic circumstantial Adjunct in the land of the blind, of the Rheme the one-eyed man is king, of the Complement/Value king, and of the clause itself.

In the following variation of the previous example, / in the land / of the blind / the one-eyed / man is / king /, there is an additional sustention² — realised by syllable lengthening — during land, corresponding to an empty Remiss in that first foot. This has the effect of marking the finality of land as Entity in its nominal group, and additionally marks the following [weak] syllable as proclitic, indicating the initiality of the Qualifier of the blind in the same nominal group.

Allowing for the possibility of proclitic [weak] syllables provides a solution to problems raised by Cruttenden (1969: 312-3)³ that follow from the procrustean requirement of Halliday (1967: 12) — following Abercrombie (1965) — that the constituents of tone groups, feet, must always begin with the Ictus. In the following example from Halliday (1967: 19):

¹ The term *Entity* will be used here throughout for the function label *Thing*. This iconically represents the complementarity of Entity (particle) and Event (motion), with *Eventivity* as the inclusive term.

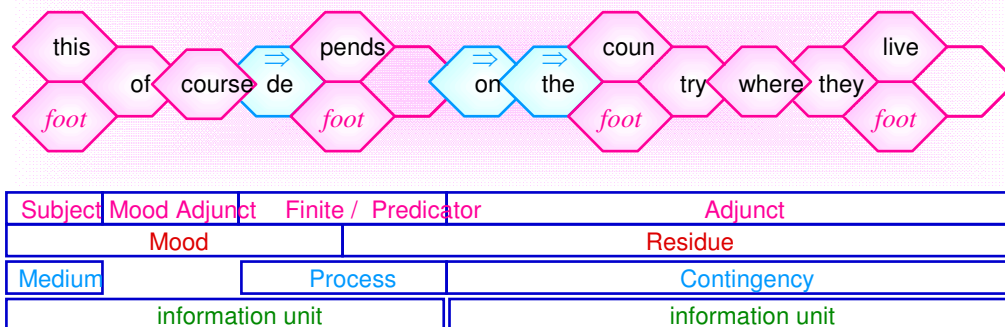
² The act of sustaining.

³ Also cited in Butler (1985: 143).

//1 this of course de/pends on the //1 country where they / live//

the "Ictus-first" rule results in the placing of a tone group boundary, and therefore information unit boundary, within a lexicogrammatical unit: between the Deictic the and the Entity country in the nominal group the country where they live. The present analysis provides for such cases with the notion of proclitic weak syllables, reinterpreting this example as

//1 this of course / de/pends //1 on the country where they / live//:

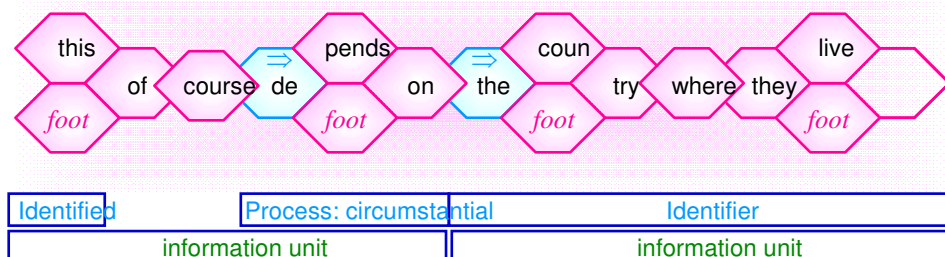


In this instance, an empty Remiss before the preposition on reflects a sustention of each preceding [salient] syllable -pend which demarcates the finality of the Process depends, and the cataphoric status of the preposition on reflects accelerated tempo which demarcates the initiality of the Contingency circumstance on the country where they live.¹ The redrawing of foot boundaries consequently realigns the tone group — and information unit — boundary between the Process depends and the preposition on that initiates the Contingency circumstance.

2.2.2.2.2 Enclitic Anaphoric Phases: Lexicogrammatical Finality

In the previous section, the work of Cruttenden (1986) was cited as evidence that [weak] syllables in foot boundary positions vary phonetically, with [accelerando] (proclitic) syllables inclining forward in time in the direction of the vectorfield to the

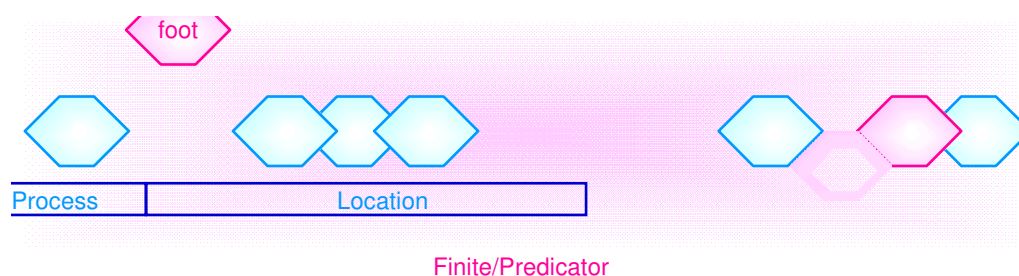
¹ The following alternative instantiation reflects and encourages an interpretation of the Process as the phrasal verb depends on, since it groups the preposition on with the preceding verb depends instead of with the following nominal group within a prepositional phrase (other contributing factors include the content interrogative form What does this depend on?).



next Ictus, and other [diminuendo] syllables, those in the Remiss phase, inclining backward in time to the previous Ictus. Those that incline backward to the previous peak were termed *anaphoric* and labelled by the symbol .

It was also said that anaphoric states are properties of foot finality, and that the marking of a phase of the foot as anaphoric indicates that the foot boundary occurs *after* the last such syllable in that phase. However, the lexicogrammatical distribution of anaphoric (Remiss) phases of the foot with more than one syllable is probabilistically associated with final lexicogrammatical positions, and so their function is to signal lexicogrammatical finality. The different functional status of such additional anaphoric syllables will be indicated by allocating them distinct *enclitic* positions in structural representations to distinguish them from the preceding Remiss position.

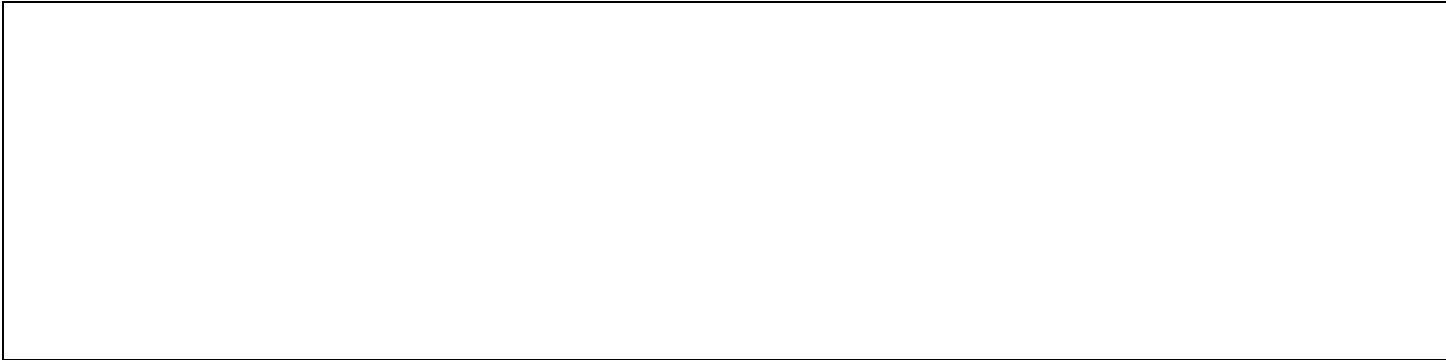
This demarcative resource of using enclitic syllables to indicate lexicogrammatical finality can be illustrated by the following instantiation of the rhythmic field of / literally / exploded / during the / argument /.



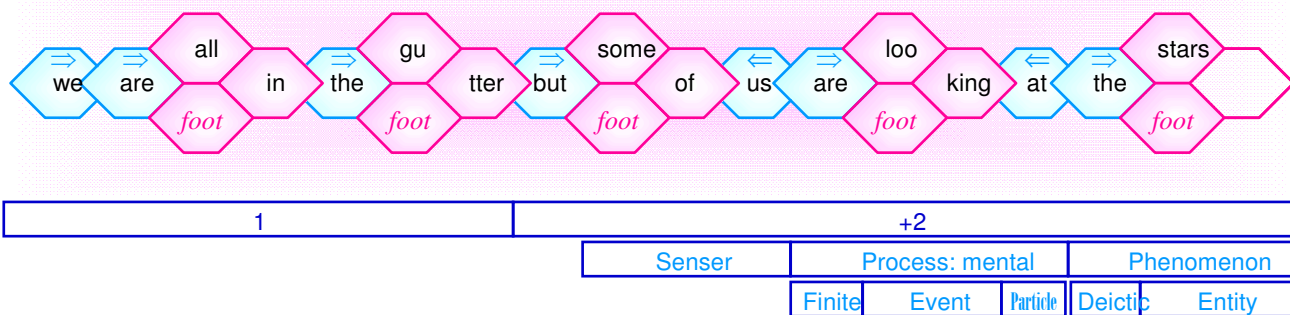
In this instantiation, the first enclitic anaphoric phase (-rally) marks the finality of the Mood Adjunct *literally*, while the second (-ment) signals the finality of the circumstantial Adjunct *during the argument*, and of the clause. Here also, the proclitic *he* marks the initiality of the Subject/Medium, and of the clause itself; the proclitic *ex* marks the initiality of the Process *exploded*; and the proclitic *the* marks the initiality of the nominal group *the argument* functioning as Range in the prepositional phrase *during the argument* functioning as circumstantial Adjunct.

In the following instantiation¹ of / no-one / has ever used / so much / intelligence / to persuade us / to be stupid /, anaphoric enclitic syllables mark the finality of the Finite element and Mood block of the first clause, the Predicator of the first clause, the Complement of the first clause and the first clause itself.

¹ An English translation of a comment by Voltaire on Rousseau, as spoken by Kenneth Clark in *The Worship Of Nature*, episode 11 of his BBC TV series *Civilisation*. To this may be added Saul Bellow's 'A great deal of intelligence can be invested in ignorance when the need for illusion is deep'.



Variations in the phoricity of [weak] syllables may partially account for the appearance of phrasal verbs in the evolution of the lexicogrammar of English. To illustrate this, consider the following instantiation of the clause complex / we are all in / the gutter / but some of us / are looking at / the stars /.



Here the preposition at is realised rhythmically as anaphoric, and thus as enclitic to the foot realising the verbal group are looking. This may well have contributed to its present lexicogrammatical interpretation of at as functioning as Particle in a phrasal verbal group are looking at, rather than as Minor Process of a prepositional phrase at the stars (functioning as a Location circumstance at clause rank).¹

This discussion has focused on *cohesive* rhythms: instantiations in which the integrity of the lexicogrammatical components of the clause is signalled by the rhythm. But rhythmic cohesion is relative, not absolute. While the moraic wave is the carrier wave of *lexicogrammatical* content, the stress wave is a modulator of that wave. Rhythmic variation differentially packages the lexicogrammatical message, and a speaker who uses less cohesive rhythms is likely to be only less easily understood.

¹ In contrast, note that if the preposition at is realised rhythmically as cataphoric, and thus as proclitic to the foot realising the nominal group the stars, it encourages its grammatical interpretation as functioning as the Minor Process of a prepositional phrase at the stars functioning as a Location circumstance at clause rank, which, in turn, encourages an interpretation of the Process are looking as behavioural.

2.3 Weaving The Texture Of Intonational Fields

The third phonogenetic field under discussion here, that of intonation, is the phonological domain most explored by Systemic linguistics, with much work focused on the paradigmatic systems of tone (selection) and the interpersonal meaning, or *key*, expressed by it. The focus here will be, as in the previous two sections, on syntagm, with very little attention paid to tone systems.

Systemic theory views the interaction of lexicogrammar and phonology as significantly different in the case of intonation from the interaction of lexicogrammar with articulation and rhythm, in that the tone group correlates with a specific quantum of the content plane, the information unit, whereas articulation and rhythm do not.¹ As Halliday (1994: 295) explains:

There is an important difference between the tone group and the foot as regards their function in the expression of meaning in English. The foot itself is not the expression of any semantic unit...The tone group...functions as the realisation of...a quantum or unit of information in the discourse. Spoken discourse takes the form of a sequence of information units...

In Chapter 1, the information unit was interpreted as arising from the systematic interstratal *interaction pattern* between phonology and lexicogrammar — rather than as a unit operating on a specific stratum.² That is to say, the *syntagmatic extent* of a tone group functions cohesively because it tracks lexicogrammar by *organising* lexicogrammatical elements³ into information units. In other words, whereas with articulation and rhythm it is *peripheral* phonological phenomena that track the syntagmatic organisation of content, with intonation it is the tone group itself that tracks content.

¹ Reasons for the different status of intonation in this regard are hypothesised in the discussion of ontogenesis in Chapter 5.

² Again, this interpretation is consistent with the statement of Halliday (1994: 292) that ‘the tone group serves to *organise* discourse into INFORMATION UNITS...’ [my italics].

³ It is important to understand that the correlation between intonation and lexicogrammar is *indirect* — mediated through the information unit — not direct. Halliday (1967:10):

But the view that phonological criteria, such as pitch and juncture, serve as direct markers of grammatical units such as morpheme, word and sentence is surely untenable...If we really did use pauses, or pitch movements, to mark boundaries of grammatical units in English, the relation between grammar and phonology would be very much simplified.

The unmarked or *default* (\neq most common) *lexicogrammatical* unit corresponding to the tone group/information unit is taken by Halliday (1967: 20-2) to be the clause. Where a tone group extends for less than a clause, the boundary mainly falls between Theme and Rheme or before a clause-final Adjunct. Cruttenden (1986: 75-80), using non-Systemic grammatical categories, makes very similar observations on probabilistic tendencies of correspondence between ‘syntactic constituents’ and ‘intonation-groups’. Furthermore, in lexically dense read speech, prepositional phrases in prepositional phrase complexes and nominal groups in nominal group complexes are highly likely to be chunked as information units by intonation (see Cléirigh & Vonwiller (forthcoming)). The most likely occurrences of a tone group extending beyond a clause are hypotactic clause complexes comprising ‘reporting clause followed by reported clause and conditioned clause followed by conditioning clause’ (ibid) — ie projections and expansions of the type $\alpha\beta$ and $\alpha^\infty\beta$.

Now, in the previous chapter, intonational texture was said to be effected by systems of intonational structure, the Pretonic and Tonic phases of the tone group, and by the systems of phonological cohesion — integration and demarcation — which signal the syntagmatic extent of lexicogrammatical units. However, because the very *structure* of the tone group functions *cohesively* in delineating the organisation of lexicogrammar into information units, the distinction between structural and cohesive phonological functions is virtually neutralised in the intonational field.¹

Nevertheless, for simplicity, this discussion will first describe the structure of the tone group and then relate the cohesive resources to the intonational field, as has been the procedure in the previous discussions of articulation and rhythm.

2.3.1 Structure Of The Tone Group

The following discussions of tone group structure will first briefly recall the periodic model of syntagm and then again present the complementary perspective founded on the notion of modification.

2.3.1.1 Periodicity: Textual Metafunction

In Chapter 1, the textual structure of the English tone group was given as represented in the following diagram.

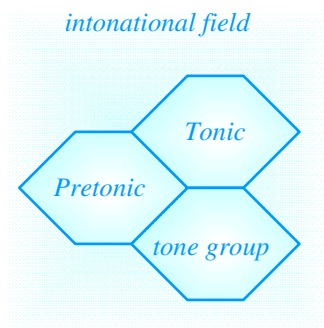


Figure 2.10 Intonational Quantum As Textual Structure

Again, the periodicity model of textual structure is not a constituency model of the tone group, but a synoptic representation of a dynamic process. The periodicity model of structure presents rhythm as a wave-train of alternating Pretonic and Tonic phases. This is to conceive of intonation as the propagation of a disturbance through an intonational field. This propagating wave-front can be depicted dynamically as

¹ That is, strictly speaking, the functions of texture only cleave into structure and cohesion below the rank of tone group.

particle tracing out an undulating path through the field, with each new phase in a new frame, as stills in a film. This perspective is represented below.

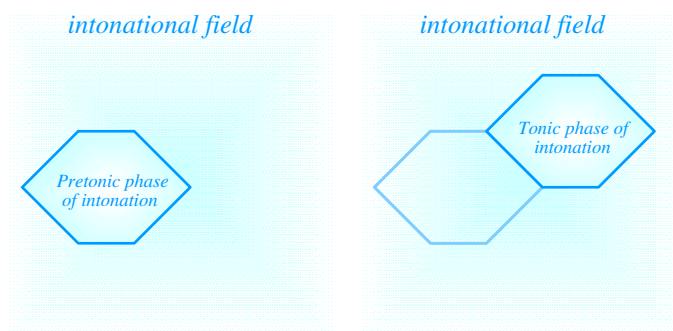


Figure 2.11 Dynamic Representation Of The Textual Structure Of The Tone Group

A synoptic representation, on the other hand, places all the phases that are probabilistically related to a particular tone group within the same frame, thereby creating the *false* impression on paper that the two phases of the particle in motion are two distinct constituent particles. This perspective appears in the figure below.

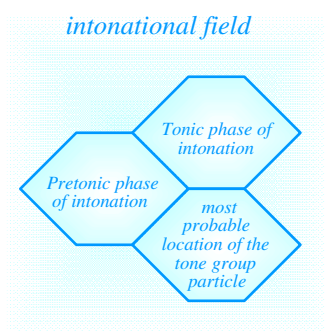


Figure 2.12 Synoptic Representation Of The Textual Structure Of The Tone Group

The textual structure of the tone group is a view of intonation as a process of periodically switching on tonicity, or what Halliday (1994: 296) calls *tonic prominence*: the main pitch movement — the main fall, rise or change of direction. Tonic prominence is an interaction of stress and phonation in that only [salient] syllables can carry the pitch shift. Phonetically, pitch varies with the frequency of vocal fold vibration, which, in turn, varies with the tension of the vocal folds and, to a lesser extent, with sub-glottal air pressure. Clark & Yallop (ibid: 38) explain the interdependence:

It is possible to distinguish three auditory dimensions or parameters of phonation: loudness, pitch and ... 'timbre'. Normally there is some interaction among the three. Perceived loudness is related to subglottal pressure. Pitch is the perceptual correlate of the frequency of vibration of the vocal folds. The frequency is determined by subglottal pressure and by laryngeal adjustments

governing the length, tension and mass of the vocal folds themselves...[Subglottal pressure] tends to remain relatively constant during a sequence of speech, except for slight rises occurring on strongly stressed syllables. Since pitch contours do not generally follow such a simple pattern, it seems reasonable to suppose that laryngeal adjustments are mainly responsible for controlling the frequency of vocal cord vibration in normal speech...¹

A foot that is produced during the main pitch movement of the tone group can be described as [tonic]. Other feet can be described as [nontonic]. And again, the tonic wave is not a derivative phenomenon resulting from the varying degrees of prominence carried by the successive feet, but an organising principle of the intonational field — just as the stress wave does not result from syllable organisation, but is the principle of their organisation, and the moraic wave does not result from segmental organisation, but is the principle of their organisation.

2.3.1.2 Modification: Logical Metafunction

The view of intonation as a process of periodically switching on tonicity can be complemented with a view of intonation as modification, intonation being the phonatory modification of rhythm. Recalling from above, modification is a component of the univariate structures that realise the logical metafunction, being hypotactic interdependency, the relation between two elements of unequal status, as between a dependent *Modifier* and the dominant *Head* which it modifies, and is indicated by Greek letter notation: $\alpha \beta \gamma$.

Viewed in terms of interdependency, the tone group is a hypotactic nexus β^{α} , with the Pretonic dependent on the Tonic. The Tonic is the dominant (α) phase of the tone group: it is both the necessary and sufficient phase of the tone group. There must be a Tonic for there to be a tone group. The Pretonic is the dependent (β) phase of the tone group: its presence implies the presence of a Tonic. This view of the tone group is represented below.

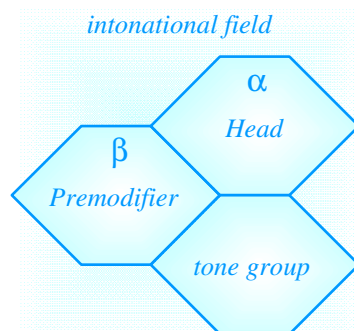


Figure 2.13 The Logical Structure Of The Tone Group: Pretonic^αTonic As Nexus Of Premodification

¹ See Ohala (1970; 1978). See Lieberman and Blumstein (1988) for an alternative position.

In English, one or both phases in the nexus may nest modification. Within the Premodifier (Pretonic), the process is one of premodification: the dominant SubHead ($\beta\alpha$) may be premodified by a preceding dependent ($\beta\beta$), which may be premodified by another ($\beta\gamma$), and so on. On the other hand, within the Head (Tonic), the process is one of postmodification: the dominant SubHead ($\alpha\alpha$) may be postmodified by a following dependent ($\alpha\beta$), which may be postmodified by another ($\alpha\gamma$), and so on. This expanded structure of the English tone group can be viewed logically, therefore, as $\beta(\dots\beta^{\wedge}\alpha)^{\wedge}\alpha(\alpha^{\wedge}\beta\dots)$, as represented below.

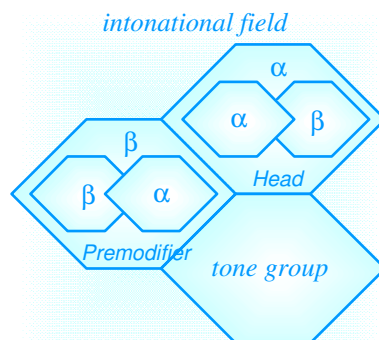


Figure 2.14 The Logical Structure Of The Tone Group: Tone Group As A Nexus Of Premodification With Nesting

However, since tone group structure cohesively tracks the extent of an information unit, the representational strategy will be to extend additional feet out, in the style previously used for demarcative clitics¹ in the discussions of articulation and rhythm, rather than to nest them within a single phase. This is operationally convenient, given the size of units to be represented, and logically consistent since the distinction between structural and cohesive phonological functions is largely neutralised in the intonational field. In the following representation, then, the Pretonic phase includes all feet (here: $\beta\beta^{\wedge}\beta\alpha$) that precede the tonic foot ($\alpha\alpha$), and the Tonic phase extends from the tonic foot till the end of the tone group (here: $\alpha\alpha^{\wedge}\alpha\beta$).

¹ The conterminality of the tone group with the information unit means that additional elements are structural rather than clitic, in contrast to articulation and rhythm, where there is no direct correspondence of expression and content plane quanta.

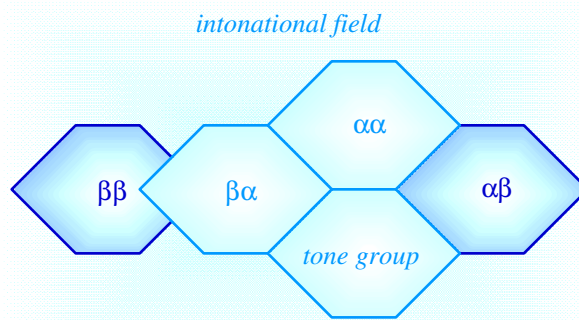
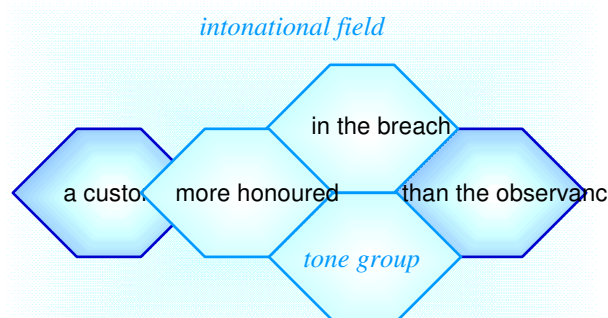


Figure 2.15 The Logical Structure Of The Tone Group

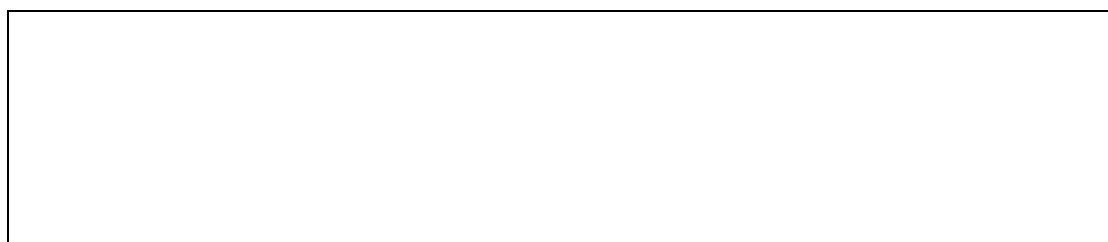
This representational strategy for tone group structure can be illustrated below by the intonational field of the following instantiation¹ of // a custom / more honoured / in the breach / than the observance //. (The inclusion of tone selection in the representation is deferred until the upcoming discussion of integrative tonal fields.)



2.3.2 Cohesion Through The Tone Group

In languages like English, intonation is used to bind together lexicogrammatical syntagms into information units. Because the information unit is conterminous with the tone group, phonological phenomena that signify the integrity of the tone group

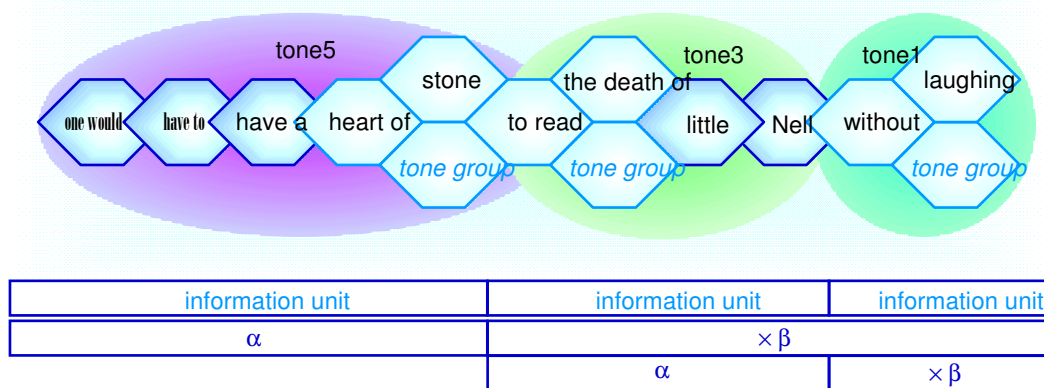
¹ As quoted by the actor Derek Fowlds in the rôle of Bernard Woolley in *The Key*, an episode of the BBC TV series *Yes, Prime Minister*. The rhythmic field is as follows:



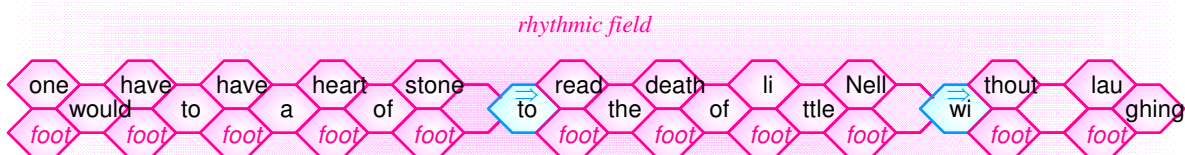
also indicate that of the information unit. That is, fields that extend for the duration of the tone group extend for the duration of the information unit, and demarcators of tone group initiality and finality are also demarcators of information unit initiality and finality. In the following discussions, the cohesive function of tonal fields and of tone group boundary phenomena will be discussed in turn.

2.3.2.1 Extension: Integrative Tonal Fields

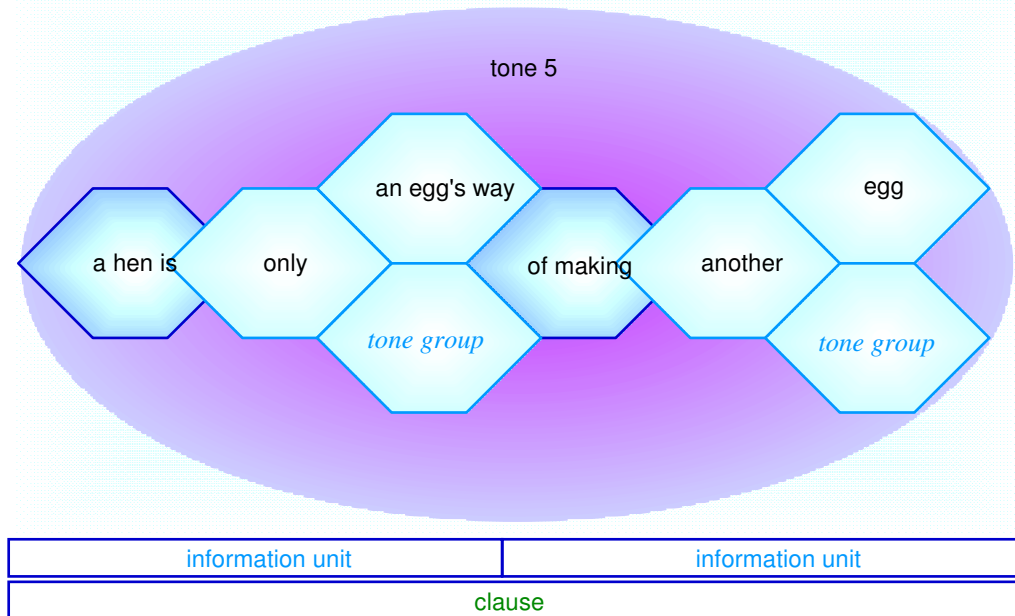
The tonal field in English functions cohesively by extending for the duration of a tone group, thereby integrating a lexicogrammatical syntagm as an information unit. This function is illustrated below¹ for //5 one would / have to / have a / heart of / stone //3 to read / the death of / little / Nell //1 without / laughing //, where tones 5, 3 and 1 are shown as states of fields surrounding the tone groups that express each clause in the complex.



¹ Oscar Wilde's comment on Charles Dickens' *The Old Curiosity Shop*, as spoken by Miriam Margolyse in her stage show *Dickens' Women*, broadcast on ABC Radio. The rhythmic field is thus as follows:



Alternatively, in the following instantiation¹ of //5 a hen is / only / an egg's way //5 of making / another / egg // a single tonal field extends for the duration of the whole clause, thereby integrating it as a unit, as well as concatenating the two information units given by the tonic wave.



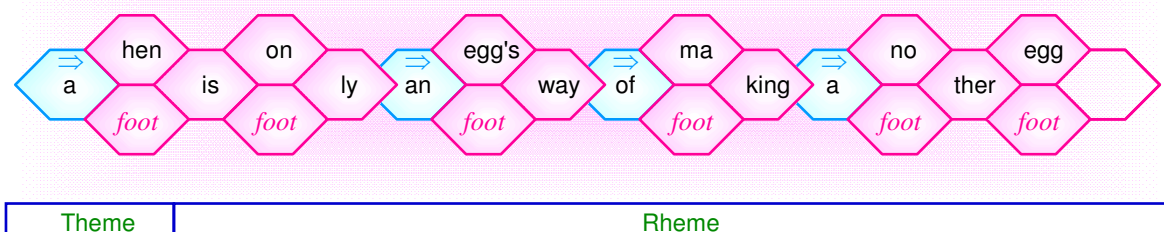
2.3.2.2 Demarcation

The demarcation of a lexicogrammatical syntagm as an information unit can be effected through phoricity in the intonational field, through the omission of a Pretonic, and through sustentions realised by pauses and lengthenings that are commonly labelled as *junctural* phenomena. These will be discussed in turn.

2.3.2.2.1 Demarcation Through Secondary Tone: Phoricity

In Chapter 1, phonogenetic fields were described as vectorfields in which each point is characterised by a vector quantity that possesses both *magnitude* and *direction*. The

¹ Douglas Muecke recalling Samuel Butler in *Irony-Coloured Spectacles*, episode 4 of his ABC Radio series *The Art Of Irony*. The rhythmic field is as follows:



magnitude of the intonational field is measured by waves of tonicity. Direction in the intonational field arises from the fact that the intonational field is polarised in one direction, along the time axis, and is therefore asymmetric in time. The biological basis of this is that the vocal tract functions asymmetrically in time, because speech is a process that primarily exploits *egressive* airstreams. The consequence of this is that initiating and terminating a tone group are not equal intonational events.

The asymmetry of the tone group can be seen in *differences* in the *secondary* tone choices at the Pretonic and at the Tonic, as proposed by Halliday (1967, 1970) for “standard” British English. Halliday (1970: 14):

[T]he secondary tones are simply subdivisions of the primary tones. Each of the primary tones can be subdivided by a more detailed classification, into two or more secondary tones....[T]he secondary tones are of two kinds: those making distinctions in the tonic (‘tonic secondary tones’) and those making distinctions in the pretonic (‘pretonic secondary tones’).

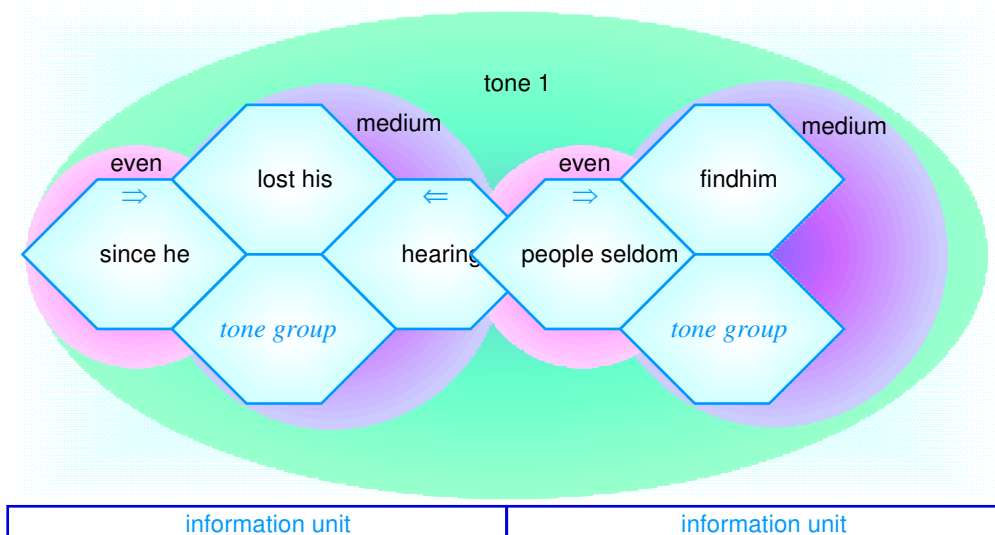
Differences in secondary tone during the Pretonic and at the Tonic can be illustrated by considering the neutral¹ secondary tone choices when the primary tone choice is tone 1. The neutral secondary tone option for primary tone 1 during the Pretonic is [even]: a ‘fairly level mid-high’ tone ‘stepping towards point of onset of tonic’, whereas during the Tonic, the neutral secondary tone option is [medium]: *falling* from ‘mid to low’ tone (Halliday 1967: 16-7).

Accordingly, [even] tone 1, as a property of the initial Pretonic phase of a tone group, indicates that feet carrying it incline forward to the next Tonic foot; and [medium] tone 1, as a property of the final Tonic phase of a tone group, indicates that [nontonic] feet carrying it incline backward to the previous Tonic foot. Again, in terms of *phoricity*, boundary positions that incline forward in time to the next peak are *cataphoric* in their reference and those that incline backward in time to the previous peak are *anaphoric*.²

Furthermore, because the tone group is conterminous with the information unit, a cataphoric secondary tone feature like [even] correlates with *information unit* initiality, whereas an anaphoric secondary tone feature like [medium] correlates with *information unit* finality. This, in turn, can assist in determining the location of information unit (and tone group) boundaries, since a cataphoric phase indicates that the information unit (and tone group) boundary occurs *before* the first such foot in that phase, while an anaphoric phase indicates that the information unit (and tone group) boundary occurs *after* the last such foot in that phase. This can be illustrated by //1 since he / lost his / hearing //1 people / seldom / find him // where secondary tonal fields, extending for the duration of the Pretonic and Tonic phases indicate the phoricity of their component feet and, therefore, the location of the information unit (and tone group) boundary.

¹ ‘Neutral’ tone choice is ‘the one used in the absence of any “good reason” for preferring one of the others’ (Halliday 1970: 10).

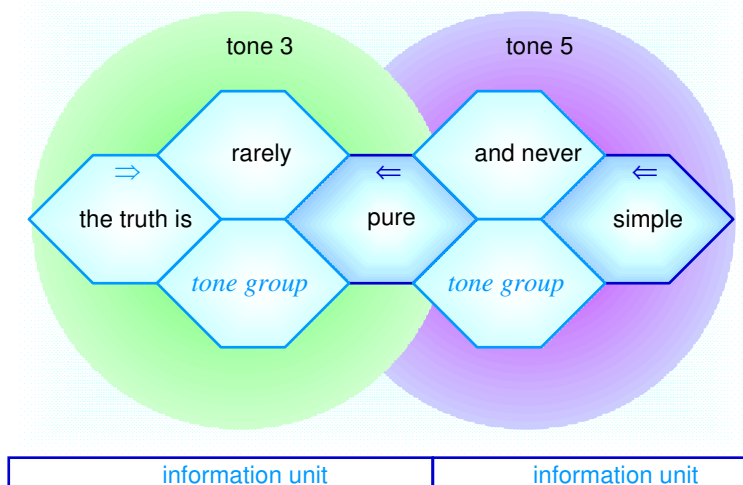
² Pre-tonic positions in a tone group are in suspense cataphorically waiting for a Tonic Nucleus, post-tonic positions are (anaphoric) resolutions.



2.3.2.2.2 Demarcation Through Omission

Demarcation of information unit initiality can be effected by the absence of a Pretonic phase, with exception of the selection of tone 3 after either tone 1 or tone 5. This is because tone 3 also occurs as the second element within compound tone groups — tone 13 and tone 53 — in which sequences of two tones have ‘become fused into a single tone group, so that there is no possibility of introducing a pretonic between the two’ (Halliday 1970: 12).

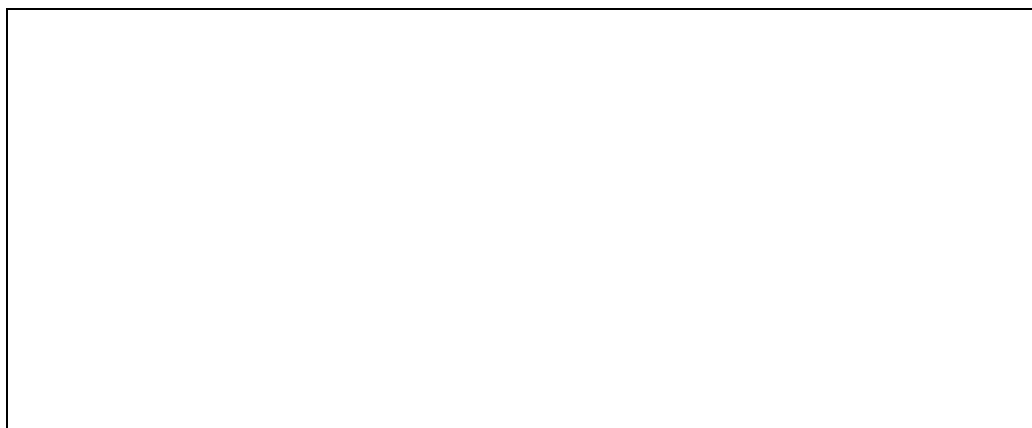
This demarcative resource can be illustrated by the intonational field of the following instantiation of //3 the truth is / rarely / pure //5 and never / simple // where the absence of a Pretonic for the second tone group signals the beginning of the second information unit.



Demarcation of information unit finality can be effected by *juncture*: either a pause — which may be either ‘unfilled’ (silence) or ‘filled’ (vocally or nasally) — or an

increased duration of an immediately preceding element (Cruttenden 1986: 35-45).¹ These sustentions will be represented here as (one or more) ‘empty’ final phases of the tone group, just as, in the discussion of rhythm, a silent Ictus or absent Remiss was represented as an empty phase of the foot. This is consistent with Van Leeuwen² (1982: 236-336; 1992: 234) where the most salient cues for juncture were found to be suspensions of rhythm.

This demarcative resource can be illustrated by the following instantiation of //3 no-one / has ever used / so much / intelligence ... //1 to persuade us / to be stupid //, where a sustention (...) after intelligence signals the end of the first information unit.



2.3.3 Cohesion Through Tone Groups³ In Complexes

Intonation can also function cohesively by expressing relations between information units, on the one hand, and between clauses and groups, on the other. These will be discussed in turn.

2.3.3.1 Interdependent Information Units

Phonological cohesion can also be effected by specific tone concatenations. A tone group whose tonal field is low-rising¹ (tone 3) expresses an information unit that is

¹ Cruttenden (ibid) additionally regards anacrusis as a delineator of tone group boundaries, whereas here it is taken to demarcate foot initiality.

² Van Leeuwen argues ‘that the notion of *rhythm group* should replace the notion of *tone group*’ (1992: 231). Here, the tone group is viewed in both its guises: as the syntagmatic unit corresponding to a single primary tone choice, and as a collection of rhythmic units — feet — gathered around a higher level prominence.

³ Halliday (1994: 10) makes passing reference to tone group complexes. Cf the *period* of Classical Prosody: ‘a group of more cola [ie “colons”]’ (Macquarie 1991: 1318). Cf also the *period* in Music: ‘a division of a composition, usually a passage of eight or sixteen bars, complete or satisfactory in itself, commonly consisting of two or more contrasted or complementary phrases ending with a conclusive cadence’ (ibid).

dependent on another information unit in an information unit complex. Tone 3 'has a number of specific functions, all of which amount to its being dependent on something else — provisional, tentative, afterthought and so on' (Halliday 1994: 303). Tone 3, especially with a [mid] Pretonic (Halliday 1970: 24, 33), signals 'message incomplete' and 'is used to show an information unit that is dependent on another one' (Halliday 1985b: 56). Completion can be effected by a tone that ends with a fall, especially tone 1 (falling). This relates to the accumulation of information in a text and the *cumulative* function of tones 1 and 3. Halliday and Hasan (1976: 271-3):

[I]f the cohesive relation itself is to be brought into focus of attention, this is marked in the usual way by tonic prominence. This takes the form of the tonic...of tone 1 (falling), if the general sense is CUMULATIVE...

[T]here is a strong case for considering the LOW RISING tone (preceded by mid level), TONE 3, as the cohesive variety of tone 1, since it does function in other respects as a kind of dependent or non-autonomous equivalent of the falling tone.

This cohesive function is illustrated below for //3 no-one / has ever used / so much / intelligence //1 to persuade us / to be stupid //, where the tone 3 field marks the first information unit (the α clause) as dependent (β) and binds it to the following information unit (the β clause) marked as dominant (α) by the tone 1 field conterminous with it.

The other rising tones, 4 (falling^rising) and 2 (rising) also indicate incompleteness to varying degrees. Halliday (1994: 228) observes, for example, that in the instantiation of //4 inflation //4 which was / necessary for the / system //1 became / also / lethal //, the tone 4 (concord) of the first two tone groups suggests *nonfinality*, and that the sequence is *completed* by tone 1. Similarly, tone 2 is used as the unmarked choice for polarity ('yes/no') interrogatives and can be used for statements or content (wh-) interrogatives to request confirmation (1970: 34), and in both uses, further information is invited for completion of the exchange.

¹ It can hardly be insignificant that rising and falling pitch imitate the Doppler effect of an approaching and departing noise source, respectively. The rising pitch that is unmarked of polar questions suggests the approach or *imminence* — and therefore: *incompleteness* — of an event (the arrival of requested information), while the falling pitch that is unmarked of statements suggests the passing — and therefore: completion — of the event. Rising vocal pitch is also bodily associated with the feeling of rising muscle tension, which sets up associations with the disturbance of (internal) homeostasis and with interpersonal — eg sexual, dramatic — tension.

2.3.3.2 Interdependent Clauses And Groups

Halliday (1994: 306) notes that syntagmatic configurations of specific tones can express logical and cohesive relations between information units:

In addition to its function in the expression of key, the system of melodic contours (the ‘tone system’) also expresses certain logical relations between successive information units in a discourse.

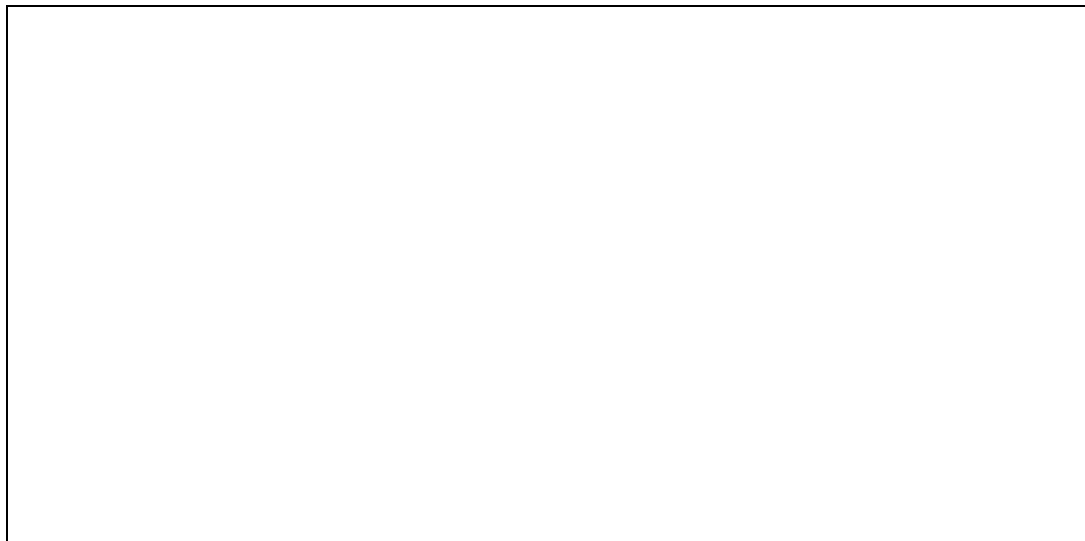
The two resources Halliday (1994: 306-7) identifies in this regard are those of TONE CONCORD and TONE SEQUENCE. Tone concord refers to ‘sequences of two or more instances of the same tone’ (ibid), and correlates with paratactic elaboration (apposition) between — especially nominal — groups. Tone sequence, on the other hand, involves the correlation of the tone sequences 3-1, 4-1 and 1-1, in the *unmarked* instance, with a sequence of two clauses that are related in the grammar paratactically, hypotactically or cohesively, respectively.

These systems will be integrated into the present description with three minor modifications. First, tone sequence and concord will be interpreted as *cohesive* — a resource of the *textual* metafunction — in so far as they package a configuration of logically related clauses as an integrated message. Second, the relations probabilistically expressed by these tone configurations will be interpreted, in light of the above, as relations between *lexicogrammatical* units — clauses and groups — rather than relations between information units. Third, the relation between the lexicogrammatical units — clauses and groups — will be interpreted as *logical* in every case, including that relation interpreted as cohesive by Halliday. This last point will be explained in the demonstration of tone sequence, below, following the illustration of tone concord.

2.3.3.2.1 Tone Concord: Group Relations

Tone concord, two or more instances of the same tone in sequence, is the unmarked realisation of two (grammatical) groups in the logico-semantic relation of paratactic elaboration (ie apposition). But note that the correlation between intonation and lexicogrammar is not bi-directional: two or more instances of the same tone in sequence can occur with lexicogrammatical structures other than the above.

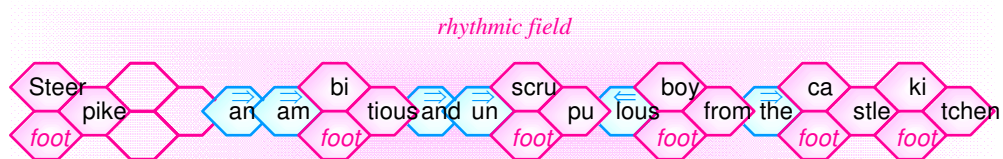
The cohesive function of tone concord can be demonstrated by¹ //3 Steerpike... //3 an ambitious / and unscrupulous / boy from / the castle / kitchen // where tone 3 concord coheres two nominal groups in apposition: Steerpike and an ambitious and unscrupulous boy from the castle kitchen.



2.3.3.2.2 Tone Sequence: Clause Relations

According to Halliday (op cit), the tone sequence 3-1 is the unmarked realisation of two clauses in a structural relation of parataxis; the tone sequence 4-1 is the unmarked realisation of two clauses ($\beta^{\wedge}\alpha$) in a structural relation of hypotaxis; and the tone sequence 1-1 is the unmarked realisation of two clauses related cohesively. These three unmarked correlations are illustrated by the following examples.

¹ As spoken by the actor Max Meldrum in the rôle of narrator in the ABC Radio dramatisation by Lawrence Lucas and Michæl Le Moignan of *The Gormenghast Trilogy* by Mervyn Peake. The rhythmic field is:

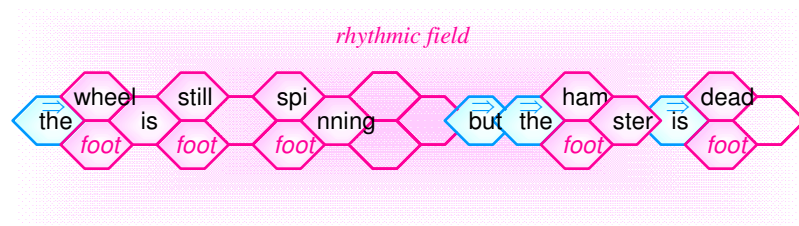


The following instantiation¹ of //3 the wheel is / still / spinning... //1 but the hamster / is dead // depicts the first type: two clauses related paratactically in the grammar correlating with two tone groups in the tone sequence 3-1:

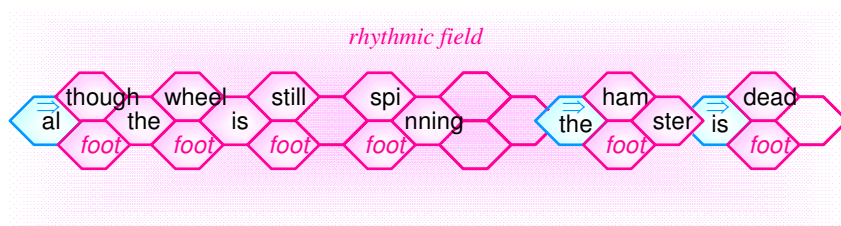
The instantiation² of //4 although the / wheel is / still / spinning... //1 the hamster / is dead // below depicts the second type: two clauses related hypotactically in the grammar correlating with two tone groups in the tone sequence 4-1:

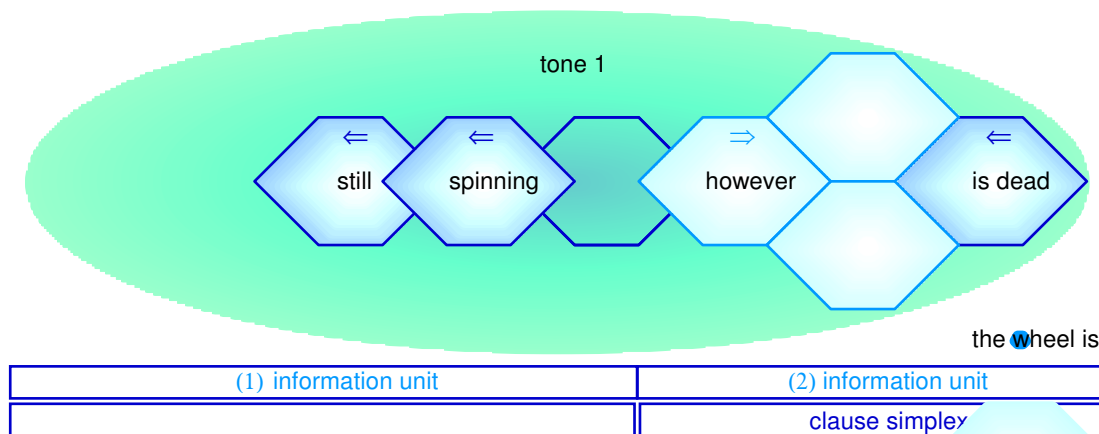
The instantiation¹ of //1 the wheel is / still / spinning... //1 however / the hamster / is dead // below depicts the third type: two clauses related cohesively in the grammar correlating with two tone groups in the tone sequence 1-1:

¹ The rhythmic field is:



² The rhythmic field is:





In the example above, Halliday would interpret the *relation between the clauses* as cohesive because he sees the clause complex as the upper limit of grammar, and ascribes relations that hold between clause complexes to cohesion, a *nonstructural* component of texture, a resource of the textual metafunction. However, if the same relation occurred *within* a clause complex, it would be considered logical.

A more consistent approach is to follow Martin (1992) who views the resources Halliday calls cohesive from the vantage point of discourse, and interprets them as systems and structures of the discourse stratum, distributing them across the metafunctions. On Martin’s model, clauses like the above are *logically* related through discursal rather than grammatical means.

2.4 Summary

This chapter has integrated notions of phonological function and structure into a model of phonogenesis by describing the creation of phonological texture — phonological structure and cohesion — in the three phonogenetic fields of articulation, rhythm and intonation. The discussion can be summarised as follows.

In describing the structural component of the texture of articulatory fields, the periodicity model of textual structure was interpreted as a synoptic representation of a dynamic process rather than as a constituency model of the syllable as static particle. In modelling phonology dynamically as a step by step process of changing potential, where each phase is distinguished by being the entry point to paradigmatic systems, a

¹ The rhythmic field is:



finer description of syllabic structure was required because, in many languages, there can be more than one entry point to paradigmatic systems during each textual phase, the Onset and Rhyme. This finer description was made in terms of the logical metafunction as hypotactic interdependency (modification) — the dependent Onset phase being a premodification of the dominant Rhyme, with each phase potentially nesting a nexus of postmodification.

The description of the cohesive component of the texture of articulatory fields, articulatory potential constrained to — and indicative of — specific lexicogrammatical domains, was concerned with three strategies: demarcation and the two varieties of extension, namely integration and concatenation. Demarcation was shown to be effected either quantitatively through variations in the number of syllable phases or qualitatively by differences in paradigmatic state potential at lexicogrammatical boundaries. Integration was shown to be effected by a charged field extending for the duration of a lexicogrammatical unit. Concatenation was shown to be effected by a charged field extending from part of one lexicogrammatical domain to part of another, binding them within a higher ranking lexicogrammatical unit. Vowel harmony in Turkish, which employs both integration and concatenation, was interpreted as a cohesive resource in which consonants are largely opaque to the (paradigmatic) state of integrative and concatenative fields.

In describing the structural component of the texture of rhythmic fields, the periodicity model of textual structure was also interpreted as a synoptic representation of a dynamic process rather than as a constituency model of the foot as static particle. The complementary logical structure of the foot was interpreted as hypotactic interdependency, with the dependent Remiss phase being a postmodification of the dominant Ictus.

The description of the cohesive component of the texture of rhythmic fields, rhythmic potential probabilistically constrained to — and indicative of — specific lexicogrammatical domains, was concerned with two demarcative strategies. In the first, omission, empty Ictus or Remiss phases probabilistically mark lexicogrammatical initiality and finality, respectively. In the second, addition, extra [weak] syllables procliticised to a following Ictus in an anacrusis, or encliticised to a preceding Remiss mark lexicogrammatical initiality and finality, respectively. Drawing on the work of Cruttenden (1986) and Catford (1988), proclitic [weak] syllables were said to differ from enclitic [weak] syllables in terms of tempo, which was taken to be an indicator of phoricity: the orientation of one foot position toward another local one in the rhythmic field as vectorfield.

In describing the structural component of the texture of intonational fields, the periodicity model of textual structure was again interpreted as a synoptic representation of a dynamic process rather than as a constituency model of the tone group as static particle. The complementary logical structure of the tone group was interpreted as hypotactic interdependency, with the dependent Pretonic phase being a premodification of the dominant Tonic, with the further potential for the Pretonic to nest a nexus of premodification, and the Tonic to nest a nexus of postmodification.

Intonation differs from articulation and rhythm in organising lexicogrammatical elements into a quantum of content: the information unit. The description of this cohesive function of intonational fields was concerned with two strategies: integration and demarcation. Integration was shown to be effected by a charged field of tone extending for the duration of an information unit. Demarcation of information unit boundaries was shown to be effected, on one hand quantitatively through the absence of a Pretonic phase in simple tone groups, or through filled or unfilled junctural sustentions, and on the other hand qualitatively by differences in paradigmatic state potential. Evidence for the latter drew on the work of Halliday (1967, 1970) to show that Pretonic phases potentially differ from Tonic phases in terms of secondary tone states, and this was in turn taken to be an indicator of phoricity: the orientation of one tone group position toward another local one in the intonational field as vectorfield.

Finally, drawing on the work of Halliday (1970, 1985b, 1994) and Halliday and Hasan (1976), specific configurations of tone states were (re)interpreted as effecting the phonological cohesion of information units, clauses and phrases in complexes. The dependence of an information unit within a hypotactic complex of information units was said to be probabilistically signalled by a rising tone, particularly low-rising tone 3, and the dominance of an information unit in a complex by a falling tone, particularly tone 1. Tone concord and tone sequence were interpreted as methods of cohering logically related phrases and clauses as integrated units.

In the next two chapters, the articulatory component of this model will be further illustrated in descriptions of the functional systems that contribute to the phonological texture of Irish.¹

¹ See also the Appendix for Australian English. It will be seen that where Irish exploits a range of demarcative and concatenative cohesive resources, English, as revealed by Australian English, relies very heavily on demarcation.