# THE EMERGENCE OF PROSODY IN LINGUISTIC THEORY

NIMAL P. PARAWAHERA

*Abstract – Prosody is a unique character in the production of sounds. Human speech is particularly marked by prosody for various functions in the different aspects of linguistics (e.g. phonology, morphology, sociolinguistics). The importance of prosody in human language had been known since very early periods of modern civilisation. Both Western and Eastern traditions had put a lot of emphasis on the proper practice of prosodic rhymes and rhythms in the use of language whether it was for analysing grammar or for praying to God or any other superior spirit. Subsequent developments in linguistics have revealed the central role played by prosody in determining the innate grammar of human language. This paper attempts to discuss in brief the evolution of the thought on prosody and its current standing in the field of linguistics.*

## Introduction

The word 'prosody' derives from the classical Greek word 'prosodiai', originally signifying processional hymns, or the rhythms that comprised them. Present-day European linguistics traces its history back to the philosophical studies of classical Greece. Questions about language were viewed as part of the study of all human knowledge. The Greeks investigated phonetics and etymology, but they invested their greatest efforts in grammar and grammar remained a major emphasis in western linguistic study until the nineteenth century. The early scholars distinguished the vowels from the consonants and identified syllables as the structural units of phonology. They also achieved articulatory description of sounds.

With the inclusion of Greece into the Macedonian Empire, the increased contact with non-Greek speakers and the divergence of the vernacular Greek, Koine, Hellenic scholars perceived a need to preserve the forms of classical Greek. Around 300 BC, the work of the Stoic school led to the recognition of linguistic studies as a distinct discipline within the field of philosophia. A system of written accent marks as guides to the correct pronunciation of words, both internally and in relationship to their surroundings was devised. To this was given the general term 'prosodiai'. The Stoics continued to concentrate linguistic study on the Greek lan-

guage using the Greek alphabet. This led to a confusion of the letter for the sound, obscuring the distinction of allophones. Mention was made of the difference between the specifically accented vowels and in segments with and without aspiration or length, but no real note was made of the different vowel qualities that must have accompanied different environments. What they lacked was a precise terminology and a descriptive theory.

### The study of grammar and phonetics

In subsequent centuries the study of literature came to replace philosophy as the central interest of Greek language studies. The earliest extant description of Greek grammar is that of Dionysius Thrax written around 100 BC. This was a descriptive work based on the writings of accepted authors. For Thrax, grammar was *"the practical knowledge of the general usages of poets and prose writers. Of its six parts, the first was "accurate reading (aloud) with due regard to the prosodies"* (Robins 1967 : 31). Later linguists enlarged on the various parts of his work. Herodian Dyscolus (2nd Century AD) and others further developed Thrax's 'prosodiai', describing in greater detail the distinctive pitch levels associated with the written accent marks, vowel length, syllable quantity, 'rough' and 'smooth' breathing (initial vowel aspiration and non-aspiration), vowel elision, and pitch changes in word compounding. Greek phonology was developed on acoustic impressions with articulatory features being secondary. In other parts of the world similar work was going on, most notably in Sanskrit, Arabic and Chinese. Much of this other work was superior to Greek scholarship, but it took many centuries for these schools to come into contact with and influence western linguistics.

The great age of Indian phonetics is now believed to have occurred between 800 BC and 150 BC, with their greatest grammarian, Panini, dated variously at 600 BC or 300 BC. As in the Greek desire to preserve the forms of Classical Greek in Hellenic times, the aim in Indian linguistics was to preserve the forms of the orally transmitted texts of the Vedic age (1200 BC-1000 BC). The greatest basic difference between Greek and Indian studies is that Greek was devised as an instructional grammar whereas the Indian was a technical, descriptive grammar. Another major difference was the view regarding the relation of word and sentence. Greek grammar was word-based, while in Sanskrit the word was usually considered to have no real existence outside the sentence or breath group. Words as such, were mere pedagogical devices. For this reason,

junction features were represented in minute detail in 'sandhi' (joining) orthography. This phonetic detail included vowel length and syllable quality, tone, tempo, and initiality and finality in the breath group. Tone was noted as relative, not absolute pitch levels. Word isolating texts also existed, and were termed 'pada' texts. It was not until after 1786, when Sir William Jones presented his now well-known paper on the indisputable relationship of Sanskrit to Latin and Greek, did Sanskrit and its exceptional descriptive treatment, exert any great influence on western linguistics. It is suspected though, that Indian linguists influenced the development of Chinese orthography and phonology as early as the first century AD.

## Writing systems

The Chinese had a writing system as early as 2000 BC in which each character or symbol represented individual morphemes. Over such a vast expanse of time, sound change is inevitable and for this reason Chinese orthography has been revised a number of times. In the 4th century BC a system of 'radicals' related to meanings, and 'phonetics', related to pronunciation was devised. Subsequent phonetic changes caused this system also to become obsolete. By the third century AD a set of prosodic values were given to the system where 'radicals' represented the initial consonants and the 'phonetic' everything else including the tone. This prosodic type of phonology was later developed into a segmental phonemic system under Sanskritic influence. In the newer system, articulatory criteria were used in the ordering and differentiating of the components. The Chinese writing system was misunderstood in 16th and 17th century Europe and was thought to be a form of the 'real characters' that were being sought for a 'universal language' of philosophy.

In the 18th century, the French philosopher Rousseau saw languages and their prosodies as having grown out of primitive grunts and gestures. Early languages had been expressive but this expressiveness had now been chilled by precision into written forms that were unable to symbolise stress and pitch differences. Rousseau viewed tonal languages like Chinese as containing primitive features. *English Grammar* (1795), written by L. Murray, was a teaching grammar that included a section on prosody reminiscent of the descriptions of Thrax. Murray divided prosody into the rules of versification and the description of the features length, stress, pause and intonation. This book is used as a reference by J. R. Firth when he

quotes the explanation that stress on a particular syllable in an English word allows us to perceive the syllables grouped around it as comprising the word. This shows, he says, that stress is a function of the syllable structure of the word. But the major impetus to linguistics in the 18th century was Sir William Jones' previously-mentioned paper that ushered in a hundred years of historical linguistics and the start of comparative linguistics.

The introduction of the obviously superior Sanskrit orthography inspired further work on revising the English orthography in the 19th century. Henry Sweet (1877), in his search for a 'one sound, one symbol' orthography for English, came to realise the impracticality of such a complicated system. He proposed a 'broad' transcription using the classes of sounds (distinctive sounds and their variants that are influenced by environment) whose characteristics he described in his *Handbook of Phonetics*. Baudouin de Courtenay, working independently in Russia, adopted the Russian word 'fonema' in 1894 as the technical term for such occurrences. The publication in 1916 of Ferdinand de Saussure's Geneva lectures, using the French term 'phoneme', brought the concept and the word into widespread modern use. In the Saussurean framework the phoneme was seen as an indestructible unit. In the following decades there was much disagreement about what exactly the phoneme was. Some scholars held that it was a mental concept of the acoustic entity of the sound, others held the 'realist' position, as by Kenneth Pike (1947) who considered phonemes to exist as structural entities and that it was important to symbolise them.

Others, including W. F. Twaddell (1935), held a so-called 'nominalist' attitude. According to him the phoneme is an appropriate term to make statements about the data in question, which in phonetics would comprise the sounds of particular languages. The phoneme became central to the theory of linguistics and to the analysis of languages. In the same period, improved mechanical analysis started to identify in a more precise manner features of intonation and of junctions between syllables, words, and other parts of utterances. These had been mentioned in the work of Sweet as 'synthesis', as distinct from 'analysis', the description of segmental sequences.

## Prosodic analysis

The 1920's and 30's are regarded as the time of the Prague School in

Europe, and the 1930's and 40's as the 'Bloomfieldian' era of American linguistics. In 1930's the Prague School explored the idea of the phoneme as an indivisible unit with their work on distinctive features. Their treatment of the phenomena of *Grenzsignale*, the non-segmental features of syllables, such as length, stress, and intonation, assigned them partially phonemic status and partially non-phonemic status. Bloomfieldian linguistics can be characterised as rigorously scientific or mechanistic. Bloomfield concentrated on formal analysis and demanded that all phenomena be objectively observable and describable. He favoured phonemic theory in a rigid segmental concept of distribution. The Bloomfieldian school posited a new type of phoneme called the 'suprasegmental phoneme' to handle the phenomena of stress, pitch, and length. These suprasegmental phonemes could extend over the entire syllable. Intonation, which extended over several syllables, was analysed into a series of distinctive pitch phonemes for each syllable.

The phoneme concept, even through all its interpretations, came originally from the search for broad transcription, as can be seen in the Pike's (1947) work : *Phonemics : A Technique for Reducing Languages to Writing*. J. R. Firth of the London School of Phonetics, like W.F. Twaddell (1935) before him, felt that a unilinear approach to phonological analysis was incomplete and unsatisfactory. What was needed was a unified theory that went beyond the comparison and contrast of elements, one that went beyond word boundaries and took into account grammatical relationships (de Saussure's syntagmatic relationships; Sweet's synthesis). In Firth's (1948) landmark paper 'Sounds and Prosodies' he put forward the theory of Prosodic Analysis. This theory was not phonemic in nature but involved distinct levels of analysis, phonematic units and prosodies. Phonematic units can be regarded as minimal segments, or C and V components, having definable phonological relationships to one another. The prosodies can be of two types : those elements that extend over more than one segment and can be relevant to the syllable or over an entire sentence, and the demarcative prosodies that delimit morpheme of word boundaries. Firth's paper was at that time, an important step in linguistic theory and deserves to be mentioned here at some length.

Firth's intention was to create a syntagmatic phonology. A basic premise (akin to the 'sandhi' position in Sanskrit) was that *"the primary linguistic data are pieces, phrases, clauses, and sentences within which the word must be delimited and defined"*(Firth 1957 :

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121)[1]. The word 'phoneme' was purposely avoided in the title of the paper because of the wide range of meanings then attributed to it. Firth would, he said *"restrict the application of the term to certain features only of consonants and vowels systematically stated 'ad hoc' for each language"* (Firth 1957 : 122). What is a consonant in one language may be prosody in another. For example, the prosodic symbol for 'rough breathing' onset in Greek became the consonant [h] in Roman. An example of the glottal stop becoming a prosody of length is the Classical Arabic /jiᵖt/ becoming /geet/ and /jEEt/ (E = epsilon) in Cairo and Iraqi Arabic respectively.

The use of the symbols C and V in phonological notation allows for the systematic statement of the syntagmatic structure of syllables. According to Firth (1957 : 123) :

*We may abstract those features which mark word or syllable initials and word or syllable finals or word junctions from the word, piece, or sentence, and regard them syntagmatically as prosodies, distinct from the phonematic constituents which are referred to as units of the consonant and vowel systems.*

Penultimate stress would be an example of a phonetic feature characteristic of position and could be stated as prosody of the word. Firth uses the analogy of musical melody and rhythm. A series of equal musical notes would contain no rhythm, just as undifferentiated syllables would result in a monotonic utterance. Rhythm is a grouping of measures, and a measure a grouping of pulses with definable interrelations of length and strength, as well as of pitch and quality. He suggests the syllable as a pulse and the word as a measure that shows definite interrelation of length, stress, tone, and voice quality. As an example he uses the five types of Cairo Arabic syllables which have predictable interrelations depending on the number, nature (open or closed), and qualities of the syllables and the sequencing of the syllable's consonants and vowels.

Firth gives a number of examples of prosodic qualities in English. 'The' and 'a' have a number of prosodic realizations depending on stress and juncture (e.g. ð, ði, ðiy, ə, ən, ey, æn). In Southern English schwa is

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[1]    Firth first published 'Sounds and Prosodies' in 1948 in *Transactions of the Philological Society*. However, all direct quotations from Firth's paper 'Sounds and Prosodies' are taken from Firth (1957) *Papers in Linguistics 1934-51*, a collection of his papers.

linked with the 'intrusive' r, the 'linking' r, the glottal stop, aitch, and even w and y, as in the following examples : vanilla(r) ice, law(r) and order, cre'ation, behind, pa(w) and ma, and be(h/y)ave. The glottal stop can be a junction prosody, such as in the Yorkshire dialect between the definite article and stressed words having initial /t/ or /d/, as in on'EEbl(E = epsilon), and tut'tEytshu (u = schwa). These are distinct from "gud dEE" and "bad taym" in which both words are stressed. The English 'h' is an excellent example of a weak form. In paradigms such as owl/howl, art/heart, and airy/hairy 'h' has phonetic value, yet across the dialects of English 'h' can disappear or intrude depending on the speaker.

In the years since the publication of 'Sounds and Prosodies' the theory has been applied to a number of languages. R.H. Robins (1957) lists some of that work in a paper entitled 'Aspects of Prosodic Analysis'. The prosodic and phonematic components used in a prosodic analysis of Siamese, which is a tonal language, monosyllabic and which has rigid syllable structure pattern are listed. They are :

SENTENCE PROSODY : Intonation;

PROSODIES OF SENTENCE PIECES : Length, Stress, and Tone relations between component syllables;

SYLLABLE PROSODIES : Length, Tone, Stress, Palatalization, Labiovelarization;

PROSODIES OF SYLLABLE PARTS : Aspiration, Retroflexion, Plosion, Unexploded closure;

PHONEMATIC CONSONANT AND VOWEL UNITS : In such classes as Velar, Dental, Bilabial, Nasal, Front, Back, Rounded, Unrounded.

Robins quotes Leonard Bloomfield's (1935) caution to practising phoneticians. Bloomfield's caveat regarded the danger of virtuosity in differentiating every sound of a language. Practitioners should instead limit themselves only to those that are distinctive. This is interpretable as meaning that they should concentrate only on the features that differentiate one word from another. As an illustration of the danger of using only phonemic analysis when features extend over a structure, Robins uses the example of Russian hard (non-palatalised) and soft (palatalised) consonants. These consonants are considered phonemically distinct but the quality of the adjacent vowels influenced by them are not, yet listeners often find it easier to distinguish the 'relevant' features by listening for the 'irrelevant' features.

As examples of demarcative prosodies Robins lists syllable-initial plosion in Siamese, penultimate stress in Swahili and Sundanese words of more than one syllable, word-initial stress in Hungarian and Czech, and differences between English word-initial and word-final consonants. These English consonantal features differentiate between noun phrases like 'an ocean/ a notion' and 'an aim/ a name', yet phonemic analysis treats the differences as merely allophonic. Further examples include the ability of languages to economically express their complex tense system of nine or more verb classes as prosodies of centrality, frontness, backness and openness. Likewise, Sudanese active verb forms can easily be differentiated from the passive by the use of the prosody of nasalization (N - prosody). The preferability of prosodic treatment of the glottal stop of Sudanese is also shown. In that language the glottal stop appears in many positions as a junction marker. Between like vowels it marks syllable division; between unlike vowels within a word it is morpheme boundary; between a consonant and a vowel it is a morpheme boundary or a word boundary; and between a vowel and a consonant it helps to define a clause within a sentence. Phonemic analysis does not distinguish any of these functions. Phonemic analysis calls for equal treatment of elements wherever they appear. This is, of course, not possible because of the differing relations that occur in different places.

Pitch, as used by Pike (1948) in his descriptions of tone languages was one of the first phonematic features that belonged to the whole syllable. Robins (1957), however, points out that these 'suprasegmental phonemes' were disqualified from inclusion in syntagmatic prosodic treatment because of their limited applicability. Suprasegmental phonemes are limited to the domain of the syllable whereas syllable prosody covers relations within whole structures as nasalization, palatalization, and glottalization as well as the pitch, stress, and length of suprasegmental phonemes.

## Fitting prosodic features into phonological theories

Much work has been done on fitting prosodic features into phonological theories. As a very broad generalisation, North American linguists have tended to treat prosodic features segmentally while British linguists have placed prosodic analysis into a separate area of treatment. Segmental treatments include Harris's (1951) 'zero phonemes' and Hockett's (1955) juncture phoneme 'bundles'. Chomsky and Halle (1968) treated [+/- stress] as a segmental feature and use algorithmic rules to assign a hierarchy of stress.

Goldsmith (1976) uses this terminology in his 'Autosegmental Phonology' theory. The literature on the subject is vast and the terminology is not standardised. According to Sloat et. al. (1978 : 70) :

*Prosody is the study of (1) quantity, stress, and tone in relation to the syllable and (2) intonation in relation to phonetic phrases and sentences. Instead of 'prosody', some linguists use the term 'suprasegmentals' in essentially the same sense (e.g. Lehiste, 1970).*

In Britain, prosodic studies have been carried on, among others, by Abercrombie, Laver, Halliday, Catford, and Brown. Halliday (1970) bases his study of the rhythm of English on 'tone groups' that comprise a number of 'feet' and containing a primary 'tonic segment'. The melody of the language comes from variations of pitch within these tone groups. Brown et al. (1980 : 14) purposely avoid focussing on 'tonics' in their study of Edinburgh Scottish English. Instead, they base the study on pitch contours, relative pitch height, and terminal tones. In their introduction to *Questions of Intonation* they give a brief summary of previous research on intonations :

*Thus Jones (1962) is particularly interested in how intonation distinguishes statements from different question-types. O'Connor and Arnold (1959) and Uldall (1964) are particularly interested in the use of intonation to express affective or attitudinal meaning. Halliday (1967) is particularly interested in the way in which intonation reveals information structure. Brazil (1978) is particularly interested in the way participants in a conversation use intonation to control interactive structure.*

In the 1980s and the 1990s, the study of prosody in phonology took several innovative turns owing to several landmark studies centred on Arabic linguistics. Pioneers of these studies were mostly American scholars in the field. Following CV Phonology (Clements and Keyser, 1983), phonological analyses took a deeper interest in the study of the skeletal tier of morphemes. The views raised in the study were further supported by the morphological theory by McCarthy and Prince (1986). Even the approaches in X-bar syntax contributed positively to this new development (Levin 1985, Lowenstamm and Kaye 1986 and Hayes 1989). All in all, these studies demonstrated very successfully that many morphological rules apply not in arbitrary phonological domains but rather in do-

mains that constitute genuine units of the prosodic hierarchy such as the mora, the syllable and the foot, all of which involve the skeletal tier of a morpheme. Thus many morphological and phonological processes apply not to an entire base, but to a portion of it that constitutes a prosodically circumscribed minimal base. This emphasises the need to understand the units of prosodic hierarchy in phonology in order to explain morphological operations. These findings shed light to widen our horizons of understanding human language and subsequently pave way for clinical and neurolinguistc research to penetrate into yet unresolved areas of human language problems related to aphasia.

The aims and methods of defining the prosodic features of languages have been and continue to be widely varied but immensely improved. Work is continuing and expanding in this field, yet, to paraphrase J. R. Firth (1957 : 138) in his conclusion to paper 'Sounds and Prosodies', whatever we isolate by analysis must be prosodically reintegrated. Firth aptly concludes his paper by saying : *"We speak prosodies and we listen to them"*.

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**Nimal P. Parawahera** *is a senior lecturer in the Department of Sinhala at the University of Kelaniya, Sri Lanka. He is the Director of the Centre Asian Research Studies at Kelaniya University. In 1983 Dr Parawahera was awarded the Rawlands Gold Medal. As a Commonwealth Scholar he pursued postgraduate studies in linguistics in Canada. For four years (1990-1994), Dr Parawahera was also a lecturer in phonology and syntax in the Department of English at the University of Malta.*

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