CHALIMBANA UNIVERSITY

DIRECTORATE OF DISTANCE EDUCATION

ELE/ LBL 4511: THEORETICAL PHONOLOGY AND MORPHOLOGY

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TABLE OF CONTENTS

MODULE OVERVIEW

Introduction

The course is on phonological and morphological theories. It starts by looking at the phonological theory then delves into looking at morphology. Under phonology, the course looks at theoretical approach to phonology including distinctive feature theory, CV theory, metrical phonology, autosegmental phonology and lexical phonology. Included is a practical component in which theories are applied to language data.

In addition to the phonological theory, the course discusses theoretical morphology, taking readers through a variety of theoretical morph spaces including introduction to some of the

current models of morphology, morphological typology and how morphology interacts with other fields of linguistics such as syntax and phonology, hence the lexical morpology.

Rationale

The course exposes you to the theory aspect of both phonology and morphology. It introduces you to matters of theory in the understanding of sounds of language as well as the internal structure of words. You are also exposed to rules governing sound classification using features and language classification based on the behaviour of morphemes in various typologies. This will help you understand the phonological and morphological theories of the language(s) you teach.

Aim

This course is important as it provides students with effective understanding of phonology and morphology theories and, how morphology interacts with other fields of linguistics.

Course Outcomes

At the end of this course, students are expected to;

- explain the various theories in phonology.
- apply some of the phonological theories to the study of a language.
- state and explain some of the morphological theories.
- explain morphological rules that apply both at word and word boundary in selected languages.
- have an understanding of geometrical phonology.
- have clear understanding of phonological features of phonemes.
- complete feature matrices correctly.
- present segments on a three-tier dimension.
- mark various prosodic features both at morphology and syntax levels.

Summary

There are two parts in this module. The first part is on phonology while the second one is on morphology. Unit One has dealt with generative phonology. In the unit, generative phonology has been discussed as a theory that analyses phonemes using features. Unit Two has discussed Feature Geometry theory. Unit Three discusses the lexical phonological theory as a theory that interacts with morphology for phonological processes are sensitive to processes of affixation.

In Unit Four, a non-linear phonological theory, autosegmental, has been discussed. The theory is posited as a theory that was initially developed to address tone in tonal languages. Unit Five is on CV Theory and Metrical phonological theory. The CV Theory analyses sound segments in syllables while the Metrical phonological theory is used in the analysis of words, phrases and higher constituents using metre.

Unit Six deals with morphological typology. Five typologies have been discussed; analytic, agglutinative, fusional infixing and incorporating typologies. Unit Seven is on morphological structure. The structures dealt with include structures for nouns and verbs, both in English and Bantu languages. Morphological processes have been discussed in Unit Eight. Among the processes discussed are affixation, internal change, suppletion, zero modification, reduplication, compounding and tone and stress shift. In the last unit, lexical morphology has been discussed. This model forms an interface between phonology and morphology and its interaction is expressed at various levels of analysis during word formation. The lexicon is the central unit.

Study Skills

As an adult learner your approach to learning will be different to that from your school days: you will choose what you want to study, you will have professional and/or personal motivation for doing so and you will most likely be fitting your study activities around other professional or domestic responsibilities.

Essentially you will be taking control of your learning environment. As a consequence, you will need to consider performance issues related to time management, goal setting, stress management, etc. Perhaps you will also need to reacquaint yourself in areas such as essay planning, coping with exams and using the web as a learning resource.

Your most significant considerations will be *time* and *space* i.e. the time you dedicate to your learning and the environment in which you engage in that learning.

We recommend that you take time now—before starting your self-study—to familiarize yourself with these issues. There are a number of excellent resources on the web. A few suggested links are:

http://www.how-to-study.com/

The “How to study” web site is dedicated to study skills resources. You will find links to study preparation (a list of nine essentials for a good study place), taking notes, strategies for reading text books, using reference sources, test anxiety.

http://www.ucc.vt.edu/stdysk/stdyhlp.html

This is the web site of the Virginia Tech, Division of Student Affairs. You will find links to time scheduling (including a “where does time go?” link), a study skill checklist, basic concentration techniques, control of the study environment, note taking, how to read essays for analysis, memory skills (“remembering”).

http://www.howtostudy.org/resources.php

Another “How to study” web site with useful links to time management, efficient reading, questioning/listening/observing skills, getting the most out of doing (“hands-on” learning), memory building, tips for staying motivated, developing a learning plan.

The above links are our suggestions to start you on your way. At the time of writing these web links were active. If you want to look for more go to www.google.com and type “self-study basics”, “self-study tips”, “self-study skills” or similar.

Time Frame

One year comprising three residential schooling; two (2) weeks of contact sessions per residential school. You need three (3) hours for formal study per week and you are expected not to spend less than ten (10) hours per week for self-study.

Need Help?

Contact: Edith Sikota-Habwanda

Email: edithhabwanda@yahoo.com

Office: Tutorial Block 1, Room 6

Required Resources

Apart from this module, as you may be interested in learning more on this subject, I have provided you with a list of recommended readings; these are books, articles and websites.

Assessment

Continuous Assessment	**50%**
One assignment	20%
One seminar presentation	10%
One test	20%
Final examination	**50%**
Final mark	**100%**

References

Katamba, Francis (1999). *Morphology*. London: Cambridge University Press.
Matthews, P. H. (20050. *Concise Dictionary of Linguistics*. Oxford: Oxford University Press.

UNIT ONE

GENERATIVE PHONOLOGY (SEGMENTAL PHONOLOGY)

1.0 Introduction

This unit looks at the generative phonology, also called segmental phonology. It presents the phonemes of the language and describes each segment using features in a feature matrix posited in Feature Theory. Distinctive features are discussed and the presentation of a fully and minimally specified feature matrices. The principle of economy and redundancy is also explained.

Learning Outcomes

By the end of this unit, you are expected to;

- give the historical development of phonological theory.
- explain the various features that are used to describe segments.
- use distinctive features to distinguish various segmental phonemes.
- distinguish between a fully-specified matrix and an understand matrix.
- explain various phonological processes.

1.1 The historical development of phonological theory

Generative phonology is a component of generative grammar that assigns the correct phonetic representations to utterances in such a way as to reflect a native speaker's internalised grammar. Noam Chomsky and Morris Halle are sole proponents as they are the founders of the Generative School of Phonology in the late 1950's. The generative point of view has influence on other linguistic levels.

The basic premises of Generative Phonology are that phonological structure reflects the linguistic competence of the individual native speaker to compute a phonetic representation for the potentially infinite number of sentences generated by the syntactic component of the grammar and that this competence can be investigated scientifically, (Kenstowicz).

The first phase in the history of **Generative Phonology** (**The Sound Pattern of English (SPE) Theory**), was characterized by a preoccupation with the **rule system**. Research during this period was concerned with extrinsic and intrinsic rule ordering, cyclic and noncyclic rules, iterative application, and various formal notations for the statement of phonological rules. This period also saw some interest in the classification of rules into rule types, such as phonetic, phonological and morphophonemic rules (e.g. Anderson (1975)), processes and rules (Stampe (1973)), P-rules, MP-rules, and via rules (Venneman (1971), Hooper (1976)), etc. This interest stemmed partly from the feeling that there was some intuitive justification for the distinction between allophonic rules and morphophonemic rules made in classical phonemic theory. In spite of this vague feeling of uneasiness, which never completely dissipated, it has been recognised that SPE, using some of the conceptual apparatus inherited from its predecessors, took a revolutionary step forward in understanding the nature of the sound systems of natural languages.

Further advances in phonological theory have, as their basis, the knowledge and experience accumulated by SPE as well as classical phonemics. The second phase in generative phonology saw a shift of focus from rule systems to the **nature of phonological representations**. SPE theory, like Bloomfieldian phonology, had assumed that the representations which served as the input and output of phonological rules were essentially strings of **segmental symbols**. The first break from this tradition came from the study of three types of phenomena: **syllable structure, stress,** and **tone**, all of them leading to a richer conception of phonological representations. Kahn (1976) reintroduced into phonology a notion that classical phonemicists outside the strict Bloomfieldian tradition had used, namely, the notion of the syllable as a grouping of segments (Pike 1947, Abercrombie 1967). The notion **Foot**, which had intuitive status in classical phonemics (Abercrombie 1967), was made available as a formal construct in phonological theory by Liberman (1975) and Liberman & Prince (1977), who proposed that the rules governing stress and intonation could be stated better in terms of representations in which syllables were grouped together in hierarchical structures called 'feet'. The proposals made by Kahn and Liberman led to the birth of **Metrical Phonology** (Halle & Vergnaud (1978), McCarthy (1979), Hayes (1980), and others). Simultaneously, the proposals in Williams (1971), Leben (1973) and Goldsmith (1976) gave rise to **Autosegmental Phonology**, which makes available to phonological theory, the Firthian intuition that in addition to sequences of entities at the level of segments (phonemic units), phonological theory must also recognize strings of entities on a parallel level (prosodic units) (Firth 1957). Autosegmental

theory introduced a formal way of relating these two 'tiers' of representations, namely, the segmental units and the autosegmental units of tone (or other phonological features), in terms of 'association conventions' that 'link' the entities on the two tiers (Pulleyblank,1983). These two theories, the domains of which overlap, come under the label of **Nonlinear Phonology**. The developments in nonlinear phonology did not negate SPE phonology: they added a new dimension to it, and made the necessary modifications called for by this dimension. The third phase in generative phonology added yet another dimension on the foundations built by SPE and nonlinear phonology. This phase can be seen as a pre-occupation of the **interaction between the Phonological Rule System and other modules of the grammar** such as Morphology. The seeds of this phase were sown when Siegel (1974) proposed that the morphological module of the grammar consisted of ordered submodules called 'levels', and that the cyclic rules of word stress in English applied within one of these modules, after every affixation. https://link.springer.com/chapter/10.1007%2F978-94-009-3719-2_1), 25.04.2020). We will look at how these cyclic rules apply as we move to Morphological Theory.

The term generative phonology refers to statements, rules or axioms which can produce all but only those well-formed utterances of a language. It is non-linear. Segments are unstructured; each has its own feature to describe it. No segment would depend on another. The goal of this theory is to make precise and explicit the ability of native speakers to produce utterances of a particular language.

1.2 Feature Theory

I am sure by now you have known that when we talk of generative phonology, we are focusing on a synonym of segmental phonology. Every natural language has a specified number of sound segments to take care of the speech. In the study of these segments, the feature theory takes into account the distinctive features.

1.2.1 Distinctive features

The central idea behind distinctive features under this theory is the notion that contrasts between phonemes can be most elegantly and insightfully described in terms of properties of segments rather than by treating segments as alphabetic atoms. Units such as phonemes are considered to be the smallest contrastive unit in the phonology. These phonemes are never the same. They have distinctive features; the features that distinguish one phoneme from another.

Therefore, there are no two phonemes that can be described the same. In our previous courses, we dealt much on description of these phonemes.

Ultimately, the theory of distinctive features is established on a restricted universal set of phonetic features that are adequate for describing the phonological contrasts and processes of any spoken language, although not all features might be relevant as contrastive properties in a particular language. Some languages, for instance need fewer of these features. Some earlier formulations following Jakobson's work appealed to the acoustic parameters of speech as the basis for a universal system whereas more recent formulations have relied more heavily on the articulatory aspects of sounds. Features may refer to major sound classes (e.g. consonant, sonorant), manner of articulation (e.g. continuant, nasal), place of articulation (e.g. anterior), or even suprasegmental aspects (e.g. stress, tone, lengthening). In some cases, features refer to the simple presence of absence of a particular characteristic, such as nasality, voicing, or the involvement/non-involvement of the tip or blade of the tongue (i.e. coronal). In other instances, + or – values reflect the extreme points of a feature that actually range over a continuum, such as the various points of articulation that may be utilised in the mouth. The use of features must effectively and naturally distinguish the significant segmental sound units (which may be individual in terms of actual production) as they contrast with each other. This is why the term ‘distinctive feature’ is used. The +/- values are referred to rather than degrees of individual features inexplicitly showing the contrastive phonological units of a language and the processes that change these units in different ways.

Following is a list of features that appear to be relevant for the description of the English sound system (including some sounds of some Bantu languages), and a matrix of the significant sound segments in terms of these features.

Consonantal: - Consonantal Sounds are produced with constriction along the centre line of the oral cavity. The only sounds that are non-consonantal in English are the vowels and glides /w/, and /y/.

Syllabic: - Syllabic refers to the role of a sound in the syllable. Segments that constitute a syllabic peak are considered to be syllabic while those not constituting a peak are non-syllabic. Typically, the vowels are syllabic and the consonants, other than certain semi-vowels and semi-consonants, are non-syllabic. Can you list the consonants that are [+syll].

Anterior: - Anterior sounds are produced with obstruction located in front of or at the alveolar ridge of the mouth. Thus, labial, dental and alveolar sounds are anterior while palatal and velar sounds are non-anterior.

Coronal: - Coronal sounds are produced with the front (tip or blade) of the tongue. Sounds that are produced with another part of the tongue (e.g. back) or not involving the tongue (e.g. labials such as p. and m) are non-coronal.

Continuant: - Continuants are characterized by continued air movement through the oral cavity during the production of the sound. Non-continuants are produced with complete obstruction in the oral cavity. The qualification of oral cavity is important in order to consider nasals such as m and n as non-continuants since the oral cavity in nasals is completely obstructed while the nasal cavity is open for the duration of the sound.

Strident: - Sounds produced with an obstruction in the oral cavity that allows air to come through a relatively long, narrow constriction possess the feature strident. As the air escapes, the turbulence produces the primary noise source over the rough surface. Most, but not all of the sounds traditionally classified as fricatives are considered to be strident and other sounds are non-strident.

Sonorant: - Sonorant sounds are typically produced with a lesser degree of cavity constriction. Vowels, nasals, and liquids are typically considered sonorants while sounds with more radical cavity constriction such as stops (p, t, k) and fricatives (s, ʃ, f, v) are typically considered non-sonorants.

Voice: – This is the feature that all of you have found easy to identify in a segment. Voiced sounds are produced with a vibration of the vocal bands in the larynx and voiceless ones are produced without such vibration. Can you classify these in the language of study according to voiced and voiceless sounds?

Nasal:- Nasal sounds are characterised by the lowering or opening of the velum so that air can escape through the nasal passage. Non-nasal sounds are produced with the velum closed so that

air can only escape through the oral cavity. Again, state the sounds in the language of your study with the feature [+Nas].

For the most part, the following features are used with reference to the classification of vowels, semi-vowels, and semi- consonants.

High: - High vowels involve the raising of the tongue from the neutral position, involving a relatively narrow construction in the oral cavity. Vowels like i, I u, and ʊ are considered to be high vowels and those produced with a lower tongue position are all considered non-high.

Low:- Low vowels are produced with a lowering of the tongue from a neutral position.(The vowel /e/ in bed is typically considered to be in neutral position). Vowels /a/ is considered to be low vowels. Note that in this system mid-vowels like /e/, or o are distinguished by being both non-high and non-low.

Back: – The feature [Back] is for sounds that are produced with the tongue retracted to the back from the neutral position. If it is produced at or in front of the neutral position, it is considered to be non-back. State the vowel sounds with this feature.

Round: - Sounds produced with a rounding of the lips are considered to be rounded. Vowels like /o, ɔ, u, ʊ/ in English are rounded while the other vowels of English are typically unrounded.

Tense - Tense sounds are produced with a deliberate, maximally distinct gesture that involves considerable muscular activity. Non-tense sounds are produced with a lesser degree of muscle activity so that they are more indistinct. Vowels like /i/ and /u/ are considered to be [+Tense] in contrast to their counterparts /I/ and /ʊ/, which are considered to be non-tense.

1.2.2 Specified features

In a specified feature matrix, all segments are described by specifying all the features they possess. The cells of the matrix, therefore, would have a plus or minus for presence or absence of the feature. Below is the fully specified matrix for selected phonemes common to English and Zambian Languages.

	I	e	a	o	u	p	b	k	g	t	d	f	v	s	z	m	n	ŋ	ʧ	ʤ	ʃ	ʒ	L	j	w	h
Consonantal	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	+
Syllabic	+	+	+	+	+	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-
Continuant	+	+	+	+	+	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-
Anterior	+	+	+	+	+	+	+	-	-	+	+	-	-	+	+	+	+	-	-	-	-	-	+	-	+	-
Coronal	-	-	-	+	+	-	-	+	+	+	+	-	-	+	+	-	+	+	+	+	+	+	+	+	-	+
High	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
Low	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Back	-	-	+	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Voice	+	+	+	+	+	-	+	-	+	-	+	-	+	-	+	+	+	+	-	+	-	+	+	+	+	-
Strident																										
Sonorant																										
Del. Release																										
Lateral																										
Round																										
Tense																										

Activity1.1

Can you complete the remaining part of the matrix, based on the notes given above? Where the feature has not discussed, begin by establishing what it is.

1.2.3 The principle of economy/ Redundancy

Although the matrix given above represents some features that are considered distinctive in both English and Zambian languages, it is noted that, for particular sounds, some of the features are predictable on the basis of other features. Thus, for example, a whole set of features needed for consonants are completely predictable for the vowels. In the most economical statement, these implied features are considered **redundant**. For example, if we know that a sound is characterized by being (-back), such as i or I, it is predictable that it must be (-round) as well, since only back vowels are rounded. Similarly if we know that a consonant sound is (+nasal),

we also know that it must be (-strident), (+continuant), and (+nasal).When the values of features are completely predictable on the basis of the values of other features for a particular sound, "we refer to them as **redundant features**. The significance of redundant features in a generative phonology is that the model is committed to a **principle of economy** in which only non-predictable information is to be included in representing the basic units and processes in phonology. Some redundancies maybe specific to a particular language (such as the prediction of rounding on the basis of backness in vowels but not-in all languages) while others appear to be universal, (such as the prediction of (-low) for all (+high) vowels).

	I	e	a	o	u	p	b	k	g	t	d	f	v	S	z	m	n	ŋ	ʧ	ʤ	ʃ	ʒ	l	j	w	h
Consonantal																								-	-	
Vocalic																+	+	+						-	-	
Voice						-	+	-	+	-	+	-	+	-	+				-	+	-	+				-
Nasal																+	+	+								
Anterior						+	+			+	+	+	+	+	+	+	+						+		+	
Coronal														+	+		+	+	+	+	+	+	+	+		+
High	+				+																					
Low			+																							
Back			+	+	+																					
Del. Release																			+	+						
Lateral																							+			
Round				+	+																					

Activity 1.2

Can you interpret each of the phonemes using features from the feature matrix? For instance, the feature [+low] describes the phoneme /a/.

1.2.4 The importance of distinctive features

We first of all see that distinctive features serve as a universal basis for describing the Phonetic components of the sound systems of language. On a more abstract level, they operate to differentiate the various lexical items of a language, since they are the smallest contrastive units

in the phonological system. Finally, their incorporation into a generative phonology allows us to state explicitly important generalisations about the phonological processes of a language, as defined on the basis of natural classes of sounds.

1.3 Phonological processes

In generative phonology, the level of the phoneme is redefined to match the deeper level of abstraction aimed for in the most efficient conception of phonological processes. It is the task of the phonological rules to account for the predictable aspects of pronunciation whether they relate to alternate pronunciations of the same basic morpheme or different phonetic forms that a sound can take. These rules, made to look like 'mathematical formulas', provide an explicit means of capturing the general principles of various phonological processes. Here are some of the processes that you need to know:

1) assimilation,

2) neutralization,

3) deletion,

4) coalescence,

5) epenthesis, and

6) redistribution.

The incorporation of distinctive features into a generative phonology allows the linguist to state explicitly important generalisations about the phonology of a language.

In assimilation, a sound takes on the characteristics of a neighbouring sound. A sound may assimilate in several ways. For one, sounds may take on the position point of articulation of a preceding or following sound. Consider the forms of the negative prefix -in in the following items: indeterminate, indignity, impotent, immaterial, inconclusive, ingratitude.

A sound may also take on a particular manner of articulation from an adjacent sound rather than the point of articulation. For example, if we look at how certain plurals are formed, we can notice the assimilation of the voicing specification in the plural suffix to the preceding sound. Consider the following words:

[kæts] 'cats'; [tɔps] 'tops'; [pæks]'packs';

[kæbz] 'cabs'; [lidz] 'lids'.

The above examples illustrate different plural forms in English language. Do you remember that we had, in earlier courses, discussed such and we called it allophony? Can you provide more examples of allophones in your language of study? Yes, the '-ed' past tense morpheme in English.

In **neutralization**, phonological distinctions operating in a language are reduced in certain types of environments. Like other types of phono-logical processes, the conditioning environment may be related to its position in higher level units (e.g. syllable), contiguous segments, or suprasegmental units such as stress. In English, a great deal of neutralization can be observed with reference to vowels.

One very widespread neutralization of English vowels concerns the **reduction** of many different vowels to a schwa-like vowel when occurring in unstressed syllables. If we thus take an item like telegraph or photograph, we note that the first syllable receives primary stress, the second syllable is unstressed, and the third syllable secondary stress. These items are usually pronounced something like (teləgra:f] and [fəʊtəgra:f], so that the schwa-like vowel occurs in the unstressed syllable. But if we add a suffix to these items so that the second syllable is now stressed, we get something like [təlegrəfi] and [fətɒgrəfi]. Note that the first and third syllable are not unstressed; consequently, they are reduced to schwa. Although there are elaborate rules for assigning stress to effect such vowel neutralizations, the important point to note here is the systematic process of neutralization in which unstressed vowels become a schwa-like vowel. In some cases, there is a zero articulation. Can you provide examples of such?

In the process of **deletion**, elements which are posited to exist in the lexical representation of units are lost in particular types of environments. In many cases, deletion processes result in a change of the syllable structure in such a way so as to arrive at more 'basic' syllable structures. For example, some processes may delete segments in order to arrive at a simple CV sequence since there is a tendency for languages to prefer such sequences. Deletion processes, then, may break up clusters of consonants and vowels in the direction of these more basic patterns. For example, if we look at the alternation of the indefinite article in Standard English, we note that the article 'a' occurs before items beginning with a consonant and 'an' before items beginning

with a vowel. By distributing the different forms of the article in this way, we can see how the preferred CV sequence is retained in English, since the distribution prevents the occurrence of CC and VV sequences. If we posit the ‘an’ as the underlying lexical form, the ‘n’ can be seen as a deletion process which arrives at the more basic CV pattern in sequences where the ‘an’ precedes a consonant.

In English, some of the deletion processes like the above are quite commonly recognised. Thus, the different types of contraction processes which account for items such as, ‘He’s made it, He’d fallen’, and ‘He’ll come’ are processes of deletion.

Consider also the following forms as they may be pronounced in casual conversation by speakers of Standard English:

[wes said] ‘west side’

[west end] 'west end’

[blain man] ‘blind man’

[blaind ai] ‘blind eye’

[wail gu:s] ‘wild goose’

[waild end] ‘wild end’

Critically study the data above. Are you able to state the rule that has applied for the process of this deletion?

Look at the relationship between the forms given below:

[sain] ‘sign’

[signəʧə(r)] ‘signature’

[rizain] ‘resign’

[rezigneiʃn] ‘resignation’

[dizain] ‘design’

[dezigneiʃn] ‘designation’

Coalescence seems to be a specialized type of Process which involves both assimilation and reduction. In this process, two or more segments are replaced by one segment that shares characteristics of the original units. A typical case of coalescence in English can be observed in the attachment of the -ion suffix to different forms. Consider the following examples:

[ribəljən] 'rebellion'

[dəminiən] 'dominion'

[demənstreiʃn] 'demonstration'

[irəʊʒn] 'erosion'

[kənfjuʒn] 'confusion'

In the first three examples, involving lexical items that end in /1/or /n/, we note that the suffix contains the palatal /j/. But in the items ending in /t, d, s/, and /z/, the final segment coalesces with the /j/ to form a corresponding palatal fricative, either /g/ or /i/, depending on whether the final segment is voiced or voiceless.

In **epenthesis** (insertion or addition), a sound segment not posited in the lexical representation of items is inserted through a regular phonological process. Epenthesis in English seems to occur less frequently than a process like deletion, but it is by no means uncommon. Both vowels and consonants may be inserted in an epenthetical process. One process which a number of linguists consider to be epenthetical involves the formation of plurals in English. In our previous discussion of assimilation, we noted that two different realization of plural, namely (s) and [z] were dependent on the voicing specification of the previous sound segment. But the observations made earlier do not account for all the regular plurals in English. In addition to the forms mentioned previously, there are plurals that insert a vowel between the final consonant and suffix, as illustrated by the following examples.

[bʌsiz] 'busses'

[rəʊziz] 'roses'

[diʃiz] 'dishes'

[mæʧiz] 'matches'

The insertion of the vowel in plurals is part of a more general process which applies when a suffix begins in a consonant quite similar to the one in which the base form ends. Thus, forms that add the -ed suffix indicate a similar type of epenthesis even though the consonant forms involved are quite different. We therefore get the following past tense forms.

[weitid] 'waited'

[reidid] 'raided'

[pla:ntid] 'planted'

Some processes of phonological change involve the redistribution of segments with respect to each other. In one sense, some of the previously mentioned processes such as deletion and epenthesis involve changes which result in the redistribution of different CV sequences. It is also possible, however, to simply change the linear order of segments in a phonological structure by permutations of one type or another. For this process, I prefer the term 'metathesis'. This is a very rare phenomenon in English language but common among Zambian languages (especially with borrowed words of English origin). In English, we hear pronunciations of ask as aks and the biblical name of Abednego as Abendigo, or still in a structural construction; He put out the fire => He put the fire out.

1.4 Rule ordering

The distributional properties of sound in natural languages are explained by resorting to a level of underlying structure in addition to the level of observed phonetic or surface representation, and to a function that maps underlying representations into surface representations. This function was conceived since the beginning of generative grammar as a (partially) ordered set of rules. A rule expresses a significant generalisation about the sound structure of a given natural language. The rules of Generative phonology, as formalised in Chomsky and Halle (1968) (henceforth SPE) and subsequent work, were formalised adaptations of descriptive statements about phonology of earlier frameworks, even though their function was not the same. Examples are drawn from some of our local languages which operate in a similar way as the language of reference.

(1) a. Two similar simple vowels, short or long, coalesce and form the corresponding long vowel. eg,

Tonga: ci + uno => cuuno 'chair'

b. An a-vowel combines with a following i-vowel to e; with a u-vowel, to o; eg,

Tonga: ma-inso ‘eyes’.

Bemba: ama-ulu ‘amoolu’

c. The i-vowel and the u-vowel before a dissimilar vowel or a diphthong, are each converted into its own corresponding semi-vowel, y or w, eg,

Bemba: umu + eni => umweeni ‘visitor’.

Joan Mascaró (https://mascaro-uab.weebly.com/uploads/4/0/9/2/40925737/ruleorderi-2011.pdf)

These facts may be captured in a simple type of convention which takes the form of the following notation (the rules that we have said look like formulas):

$X \longrightarrow Y / A - B$

In such a convention, X is the input for the rule and the arrow indicates that it is changed to or ‘becomes’ Y, the output of the rule. The slant line (/) indicates that anything beyond that point is relevant environment for the rule to operate. If the relevant environment proceeds the sound, then it is placed before the ‘environmental bar’ (i.e. the line) and if the following environment is relevant, then it is placed, following the bar.

Will you be able to formulate, using notation, some of the rules that apply in the language of your study?

Activity 1.3

1. Provide appropriate description for the rules represented by the following notations:
   i. $A \longrightarrow B / \_\_\_ [+Nasal]$
   ii. $A \longrightarrow B / [+Voice] \_\_\_$
2. Provide examples for the descriptions in (1) above.
3. Why is ‘Segmental Phonology’ termed a non-linear phonological theory?
4. Explain the phonological rules that apply on lexical items in a language of your choice.
5. With an example, explain the concept of ‘redundancy’ under feature theory.

Summary

This unit deals with generative phonology which is a non-linear phonological theory. Each of the sounds of a language is a distinctive feature. Hence, it is based on the segmental features or phonemes of the language. Each language has a specified number of segments (phonemes) which are distinct. It is for this reason that no single segment can be described exactly as another. In this unit you have also learnt that the generative or segmental phonology uses feature theory where feature matrices are used. The matrix can be fully specified or apply the principle of economy. Some phonological processes can apply in the construction of combined segments of the language.

UNIT TWO

FEATURE GEOMETRY THEORY

2.0 Introduction

In this unit you are exposed to another phonological theory, the Feature Geometry Theory. Is it familiar to you? You may be familiar with features in phonology, and geometry in mathematics. The theory borrows from each of the concepts.

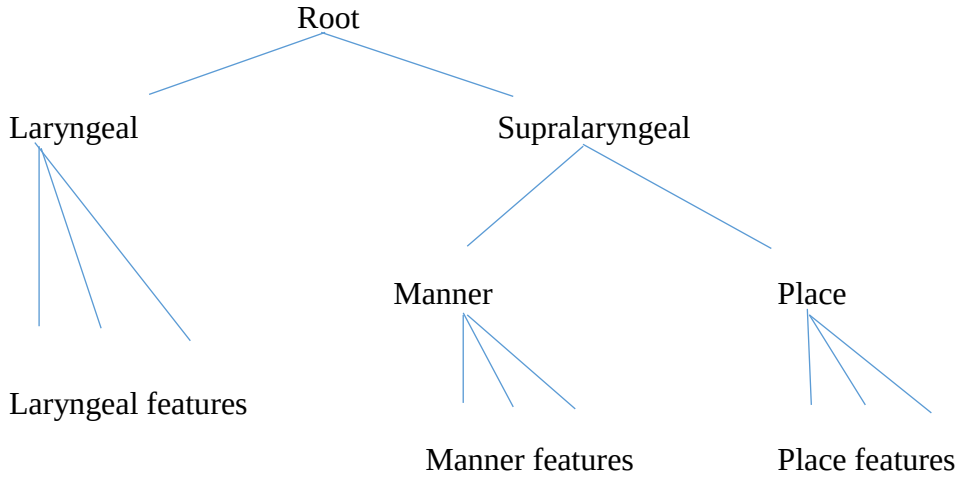
Learning outcomes

By the end of this unit, you are expected to;

- explain what feature geometry theory is.
- analyse phonemes using the feature geometry theory.

1.1 Representation in feature geometry theory

Feature geometry is a phonological theory which represents distinctive features as a structured hierarchy rather than a matrix or a set. A segment is not just an unorganised bundle of features, but features have their own internal organization. Feature geometry grew out of autosegmental phonology, which emphasizes the autonomous nature of distinctive features and the non-uniform relationships among them.



(http://cms.bufs.ac.kr/yslee/research/diss/ch_03.pdf) (28.04.2020).

As shown in the diagram above, Clements (1985) recognises that there are three major feature groups, laryngeal features, manner features and place features, which Clements calls Class Nodes. The phoneme /p/ for instance will have [- voice] laryngeal feature, [bilabial] place feature and [plosive] as manner feature. Rules of phonology often involve more than a single feature. For example, a nasal assimilates to the entire set of place features of an immediately following consonant.
(https://www.annualreviews.org/doi/pdf/10.1146/annurev.an.18.100189.001223)
(28.04.2020).
Let us consider the various realisations of the progressive marker:

a. mbale 'plate'
b. nthano 'story'
c. ŋgoma 'drum'
d. ɲyama 'meat'

The nasal is labial before a labial consonant, alveolar before an alveolar consonant, palatal before a palatal consonant, velar before a velar consonant. Within a linear theory, this means that the values of a set of distinctive features must be affected by a single rule. Look at the following example in Rwanda:

a. /ku-N-gaya/[kuuŋgaya]'to despise me'
b. /mu-N-ßona/[muumbona] 'you see me'
c. /ku-N-meɲ-a/[kuumeɲa]'to know me'
d. /ßa-N-nanir-a/[ßaananira] 'they tire me'
e. /ßa-N-aaka/[ßaaɲaka] 'they ask me'
f. /ku-N-íißa/[kuûɲißa] 'to robe me, to steal me'

http://www.lingref.com/cpp/acal/44/paper3125.pdf downloaded on 21.05.2020.

Activity 2.1

Using Feature Geometry Theory, describe the following bold phonemes:

i. consta**n**t
ii. a**m**bulance
iii. **b**in

Summary

In this unit, we have seen that Feature Geometry Theory is a linear phonological theory which represents distinctive features as a structured hierarchy. Features have their own internal organization. The values of a set of distinctive features must be affected by a single rule.

UNIT THREE

LEXICAL PHONOLOGICAL THEORY

3.0 Introduction

This unit deals with another phonological theory, the lexical phonological theory. The theory or model is governed by rules such as the cyclic, post cyclic and post lexical rules. You are aware that the lexicon build up from the sounds of a language.

Learning Outcomes

By the end of this unit, you are expected to;

- explain the lexical phonological theory.
- explain the phonological rules governed in the phonological theory.
- use the theory in the analysis of word constructions.
- describe the rules that apply at some levels of analysis.

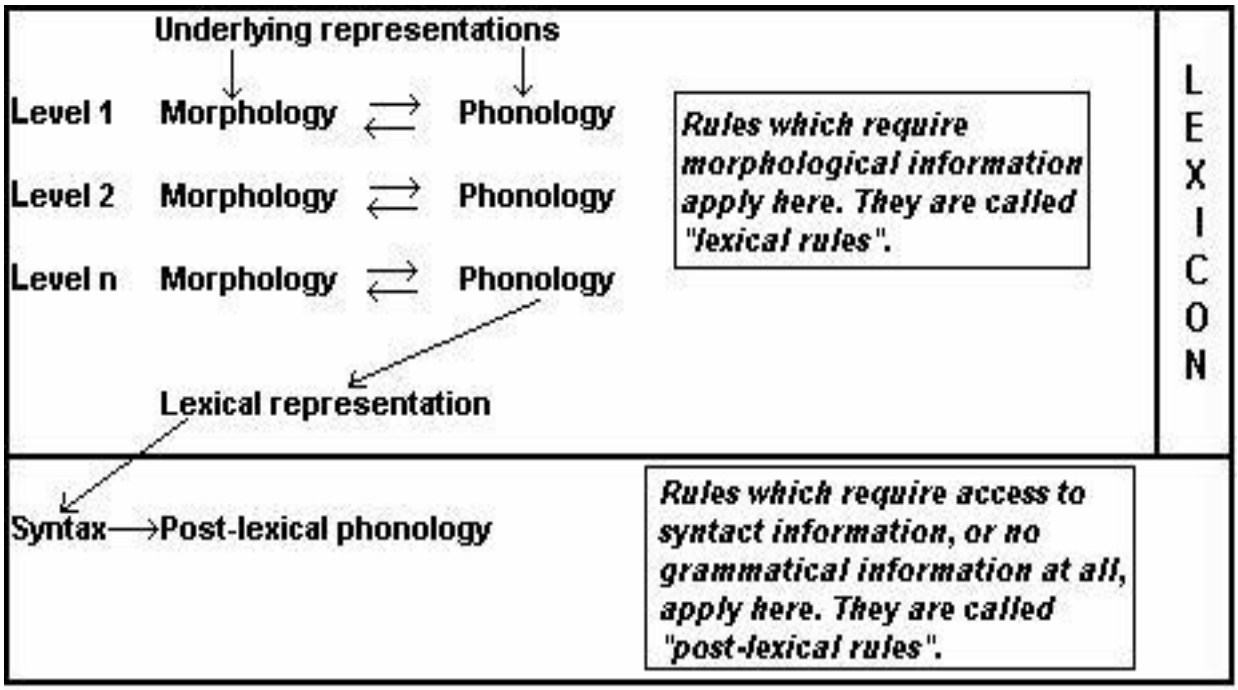
3.1 The model

Lexical phonology is an approach to phonology that accounts for the interactions of morphology and phonology in the word building process. The lexicon plays a central, productive role in the theory. It consists of ordered levels, which are the domain for certain phonological or morphological processes. Its basic claim is that all morphological processes, and many phonological ones, are carried out in the lexicon.

3.2 Representation of the Lexical Phonology

Study the following diagram of the Lexical Phonology Model:

Figure 1: The representation of the lexical phonology model



What is your interpretation of the representation above? It is clear from the diagram that the underlying representation of the lexicon is multilevel, with interaction of phonology and morphology and lexical representation feeds to the syntax level. Level *n* is any number of levels that may apply. Let us consider the following English examples:

sane [sejn] => sanity [sanIti]
neighbour [neibə(r)] => neighbourhood [neIbəhʊd]

The following rule applies across level 1 morpheme boundaries:

> A tense vowel becomes lax when a short word is lengthened by adding a suffix, so that the word ends up having at least three syllables.

This derivation demonstrates affixation in lexical phonology accompanied by the application of a phonological rule, trisyllabic shortening.

Underlying representations:

	[sein] [Iti]	**[neibə(r)] [hʊd]**
Level 1:		
Affixation:	**[sein] [Iti]**	**does not apply**
Shortening:	**[sæn] [Iti]**	**does not apply**
Level 2:		
Affixation:	**does not apply**	**[neibə(r)] [hʊd]**
Phonetic representations:		
	[sænIti]	**neibə(r)hʊd]**

https://glossary.sil.org/term/lexical-phonology Downloaded on (24.04.20).

3.3 Rules governing lexical phonology

The rules governing lexical phonology include cyclic, post-cyclic and post lexical rules. Cyclic rules apply in the lexicon and interact with morphological rules. Post-cyclic lexical rules do not interact with morphology, and are not subject to Strict Cyclicity. They apply freely both inside morphemes and across word boundaries. Postlexical rules apply in the phonological component, which is ordered after the syntactic component, that is, inside words and across word boundary.

After every word-formation rule, lexical phonological rules re-apply, hence the term ‘cyclic’. These rules are subject to the Strict Cyclicity Condition. Therefore, we can say that there is one cyclic stratum where rules of word formation are applied; after which there are two non-cyclic stratum where phonological rules apply. All word-formation rules precede phonological rules. The following strata were proposed by Halle and Mohanan (1985):

Strata 1: (Cyclic – class I derivation and irregular inflection
Strata 2: (Non-Cyclic) – class II derivation
Strata 3: (Cyclic) - compounding
Strata 4: (Cyclic) – regular inflection
Strata 5: (Non-cyclic) – post-lexical phonology
https://www.researchgate.net/publication/285184789_Postcyclic_versus_postlexical_rules_in_lexical_phonology (Downloaded on 24.04.20).

In English the adjective 'opaque' plus the nominal suffix '–ity' (formally represented as [[opaque] ity]) constitute a cyclic domain to which the cyclic stress rules and the cyclic rules of Trisyllabic Shortening and Velar Softening apply, yielding the surface form 'opacity'.

In the model, these rules apply at different levels as we have seen above.
Level 1 we can have 'primary' (i.e., irregular) inflection (tooth/teeth) or primary derivational affixes (-al, -ous, -ant, in- etc.), including some Ø affixes. The phonological rules that would apply include stress, trisyllabic shortening (opacity), obligatory nasal assimilation (illegal) and velar softening (electricity)

At Level 2, secondary derivational affixes (-ness, -er, un-, etc.) and compounding eg. blackbird. The phonological rules include compound stress. Affixation does not affect stress in the base: – revenge/revengeful. No trisyllabic shortening occurs: – leader/leaderless

At Level 3, "secondary" (regular) inflectional affixes (-s, -ed, -ing). At this level, the phonological rules that apply are optional sonorant re-syllabification. At syntax level, the post-lexical rules such as aspiration and tapping would apply. You will perhaps realise that there is no word formation rules after the lexical component. So the post-lexical rules do not derive or inflect any morphological category, (Mohanan, 1986; https://books.google.co.zm/books?lexical+phonology+theory&ots) downloaded on 21.04.2020.

Taking for example the word syllabifications; what we start with is the root [syllable] then add the derivational affix [-fy], another derivational affix [ic] (*cyclic*), and another [-ation] (*cyclic*). At level 3, the inflectional morpheme [s] (*post cyclic*) would be added. This can be presented as follows:

[[[[[syllab (le)] –f(y)] –ic] –ation] –s]

Remember, you cannot add derivational morphemes after adding inflectional morphemes. It is worth to state here that irregular inflection is in Level 1 and once applied would block any other forms of affixes. Note also that if a word bears *n* affixes from the same level, it goes through that level's phonology *n* times. So, if there are three affixes at level 1, then there must be three phonological rules applying. Further, items in round brackets are erased through the morphological process of deletion. There is also bracket erasure at the end of each cycle.

You may need to know also that nominal and verbal forms behave differently. Nominal forms become ungrammatical when you increase the number of affixes. These forms suggest that the disyllabic minimal size condition is enforced cyclically: each suffixed sub-constituent must satisfy the minimal size condition. Therefore, inflectional affixes apply once. Verbal forms, however, do become grammatical even when more affixes are added to the root. You can prove this in any Zambian Language verbals.

Activity 3.1

1. Explain how the lexical phonological theory operates.
2. Explain the cyclic, post-cyclic and post-lexical rules.
3. Using the lexical phonological theory, analyse the following words:
    i. autosegmentals
    ii. harmonisation
    iii. well-formedness
    iv. deconstructionism
    v. divination

Summary

In this unit, you have realised that the lexical phonological theory is a linear phonological theory which presents the lexicon as the central element of the theory. There is also interaction of phonology and morphology and lexical representation feeds to the syntax level.

UNIT FOUR

AUTOSEGMENTAL THEORY

4.0 Introduction

This unit deals with the unique theory of phonology, the autosegmental theory. You are very much aware of segments and the segmental phonology which we have already discussed in Chapter 1. Although unique, you will realise that it roots from the earlier theories of phonological theory as already seen.

Learning Outcomes

By the end of this unit, you are expected to;

- explain what autosegmental theory is.
- give autosegmental representations of phonemes.
- explain the well-formedness condition of the theory.

4.1 The theory

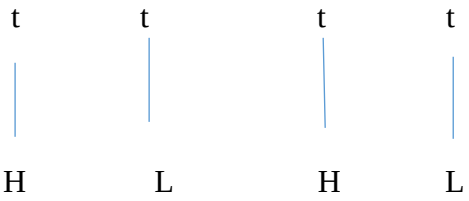
Autosegmental phonology is a theory of non-linear phonological representation. It was developed out of research in Generative Phonology at MIT in the mid and late 1970s, as a response to certain problems in the phonological theory of that time. Autosegmental phonology was initially developed in response to the challenge of developing an adequate theory of tone. Theories such as generative phonological theory could not account for tone in tonal languages.

The approach allows phonological processes, such as tone and vowel harmony, to be independent of and extend beyond individual consonants and vowels. As a result, the phonological processes may influence more than one vowel or consonant at a time.

Under this theory, underlying tones are represented on separate tiers from the feature matrices representing vowels and consonants; they are subsequently merged with these matrices by *Tone Mapping Rules* that apply in the course of derivation, creating single-tiered representations in surface structure.

The principal innovation of autosegmental phonology, as presented in Goldsmith 1976, is the idea that tone mapping rules do not merge tonal and segmental representations, but associate their elements by means of formal entities known as *Association Lines*. In this framework, phonological representations consist of parallel tiers of phonological segments, both tonal and segmental.

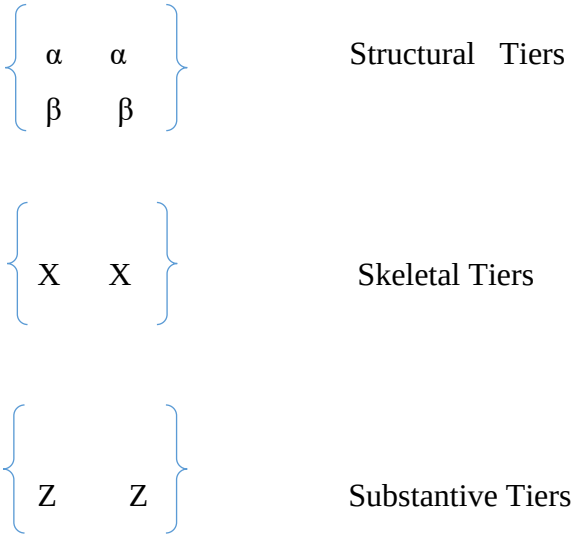
4.1.1 Tonal Representation



H = high tone L = low tone t = any tone-bearing unit (vowels or syllables).

4.1.2 Autosegmental Representation

We can as well look at the following representation:



http://www.ling.fju.edu.tw/phono/eva/AUTOSEGMENTAL/THEORY.htm (28.04.2020)

Elements of each tier, called **autosegmentals**, are sequentially ordered; elements of adjacent tiers are simultaneous if and only if they are linked by association lines. In this model, all tiers remain independent throughout derivations: at no point is the tonal tier merged with segmental tier.

Kaonde: mwa . na

The same lexeme would be produced with different tone in different Zambian languages. For instance, Bemba will have HL tone sequence while Tonga will have LL.

A further innovation of autosegmental theory is the set of universal principles termed 'Well-Formedness Conditions'**,** which govern the multi-tiered structure of the representation. These principles not only define the set of theoretically possible inter-tier configurations; they also trigger the operation of a set of universal repair mechanisms, often termed Association Conventions, whenever configurations that violate them arise.

In subsequent work, autosegmental phonology underwent further development; by the mid-1980s it could be considered a fully general theory of phonological representation, radically different from the linear representational systems of more traditional approaches. The primary innovation of the generalised model has been the view that not just tone and other 'prosodic' features, but all phonological feature are arrayed on separate autosegmental tiers.

The autosegmental formalism deals with several separate linear sequences; because of this, a phonological representation is depicted on several distinct tiers. Each of these tiers shows a different language feature:

1. Segmental tier

The autosegmental tier (skeletal tier) contains the features that define the segments articulated in the phonological representation. In the segmental tier, features are assigned to segments.

2. Timing tier

The timing tier contains timing units that define the lengths of segments in the phonological representation. These timing units are commonly depicted as X's, and are assigned to segments.

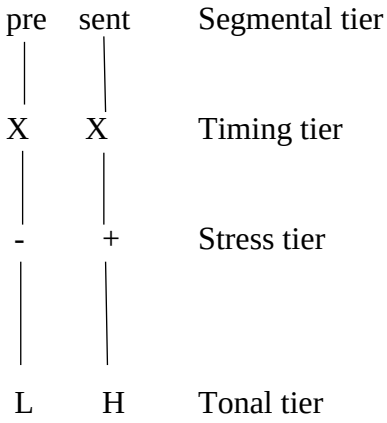
3. Stress tier

The stress tier contains the features that show the distribution of stress in the phonological representation. The features in the stress tier are [+/– stress] and [+/– main], and they are assigned to the stress-bearing units of the language (syllables or moras).

4. Tone tier

The tone tier contains the features that show the distribution of tones in the phonological representation. The features in the tone tier are [+/– high pitch] and [+/– low pitch], and they are assigned to the tone-bearing units of the language (syllables or moras).

Let us present the verb 'pre.ˈsent'



4.3 Well-Formedness Condition

As a theory of the dynamic of phonological representations, autosegmental phonology includes:

i. Every tonal element is associated with at least one tone-bearing element; and every tone-bearing element is associated with at least one tonal element.
ii. Association lines do not cross.
iii. Vowels link to vowels and consonants to consonants

iv. A skeletal node can't be linked to two different segments on different tiers

In case of a violation of the Well-formedness Condition: add or delete the minimum number of association lines in order to maximally satisfy it. Many of the most interesting predictions of the autosegmental model derive from the automatic effects of the well-formedness condition and their independence of language-particular rules, file:///C:/Users/Languages%20Department/Downloads/Nonlinear%20phonology%20An%20overview.pdf) (23.10.19). Therefore, certain rules in one language would not apply in the same way in another language.

4.2 Rules governing tone mapping

Tones are associated with syllables, where one tone can be associated with several syllables or several tones can be associated with one syllable. In the Nyanja word mtengo 'tree' for instance, the second syllable is associated with two tones; HL but in mtengo 'price', the syllable is associated with one tone; the LL. Hence:

Activity 4.1

1. What prompted the development of autosegmental theory?
2. How does the theory help in the analysis of phonemes in language?
3. Explain the well-formedness condition under autosegmental theory.
4. Analyse the following lexemes (translated in any of the Zambian Languages):
    i. kindness
    ii. selfishness
    iii. recognition
    iv. workmanship
    v. go! (plural subject)

Summary

For any tonal language, the autosegmental theory would be needed so as to make representation over tone bearing units in such tonal languages. The theory, representing the phonological elements in distinct tiers, connected with association lines, has broken the challenge of tonal representation which all the predecessor theories could not address.

UNIT FIVE

CV THEORY AND METRICAL PHONOLOGICAL THEORY

5.0 Introduction

What do you relate CV to? Yes, it is Consonant Vowel arrangement. What do you think this arrangement of consonant and vowel all about? In this unit, you will look at the CV theory which like autosegmental theory presents phonological segments in tiers. A word would have various syllables and these syllables have peaks. The unit further looks at metrical phonological theory. Read through this unit and be able to use the theories with analysis of the language of your study.

Learning Outcomes

By the end of the unit, you are expected to;

- describe the CV theory.
- determine the syllable types of the language of your study.
- relate metrical phonological theory to autosegmental theory.

5.1 CV Theory

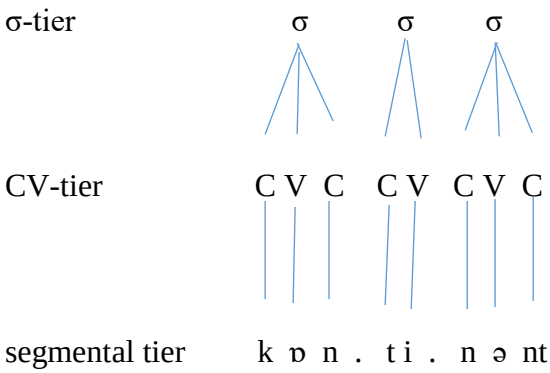
CV phonology proposes an additional tier in phonological representation; the CV-tier which defines functional positions within the syllable, as well as allowing a simple account of such syllable-related phenomena. A diphthong can be shown as two vowel qualities functioning as, or filling the position of, a single vowel; or a lengthened or geminate consonant can be represented as a single segment spreading over two Consonant position.

It is a theory of syllable representation which characterises the syllable as a three-tiered structure having the formal properties of autosegmental system. It claims that the terminal elements of syllable trees are not vowels and consonants themselves, but rather the units of the CV-tier which define positions in syllable structure that particular consonants and vowels may occupy. The independence of the CV-tier and the segmental tier is evidenced by the fact that phonological rules may apply independently to the members of either tier, or may affect the

manner in which the elements of these two tiers are associated with each other. Moreover, phonological rules may be sensitive to the difference between identical syllable trees which differ in the composition of the CV-tier.

5.1.2 Tree diagrams in CV theory

Syllable trees consist of three-tiered representations, in which each tier has a certain vocabulary associated with it. The vocabulary of the first, or σ-tier, consists of the single element 'σ'. The vocabulary of the second, or CV-tier, consists of the two element C,V; and the vocabulary of the third, or segmental tier (nucleus tier), consists of single-column phonetic matrices characterising consonants and vowels in usual manner. Well-formed strings on each tier consist of concatenations of the members of the alphabet defined on that tier. In the three-tier representation, the word 'continent' will be represented as follows:



The elements of the CV-tier distinguish between syllable peaks and syllable non-peaks（or syllable margins). Specially, any segment dominated by V is interpreted as a syllable peak, and any segment dominated by C is interpreted as a non-peak. Thus in the above mentioned example, the elements [ɒ], [i], [ə] constitute syllable peaks; the remaining elements are non-peaks. Elements of neighbouring tiers may be related in much the same way that syntactic elements are related in tree structures. In syntactic theory these relations are specified in terms of lines which are called "branches" while in multi-tiered phonological representations, they are specified in terms of "association lines. The notion of "immediate constituent" holds in multi-tiered phonological representations just as it does in syntactic theory. Therefore, the consonants /k, n, t/ and the sequence of /nt/ in the example of the term 'continent' are both immediate constituents of the category C , and the 'C is an immediate constituent of the category syllable σ.

While the similarity between syntactic trees and syllable trees is instructive, there are several differences between them. First, the notion of tier plays no significant role in current syntactic theory. Thus, in the tiered representations presented here, the number of levels between the root and the terminals of a given structure is fixed at three. In syntactic trees no such fixed number is characterized. Second, while in syllable theory the elements of the alphabet are exhaustively partitioned among the three tiers of syllable representation（i.e. each tier has its own alphabet and shares it with no other tier）, in syntactic theory the non-terminal symbols may appear at any non-terminal level of the tree. (http://www.ling.fju.edu.tw/phono/cv.htm)

5.1.3 Syllable types

The primary set of core syllable types comprise: CV, V, CVC, and VC. VC is the most highly marked in the sense that any language that has the VC must also have CV, V, and CVC sequences. CV type belongs to the grammar of all languages.

Some languages allow core syllable types to include sequences of consecutive V-elements. Some languages allow one C-element in initial or final position in the syllable.

5.2 Metrical Phonological Theory

Metrical phonology is concerned with organizing segments into groups of relative prominence. Metrical phonology is a phonological theory concerned with stress phenomena in natural language. It is distinguished from previous approaches in that it posits a hierarchical structure reminiscent of the structures used in traditional discussions of poetic meter, hence the name metrical theory. Segments are organized into groups of relative prominence; that is, into syllables, syllables into metrical feet, feet into phonological words, and words into larger units. This organization is represented formally by metrical trees and grids. It is also much broader in coverage in that it relates stress to several other domains. https://www.annualreviews.org/doi/pdf/10.1146/annurev.an.24.100195.001525 (12.04.19). The origin of the approach was the independent description of the tonal structure of languages (African tone languages at first), and it was then developed to cover all aspects of the sound structure, including the association of syllabic structure to sound segments.

5.2.1 Non-linear stress allocation

Metrical phonology is an approach to word, phrase and sentence-stress definition which (a) defined stress as a syllabic property, not a vowel-inherent feature, and (b) allowed a more flexible treatment of stress patterns in;

i) different languages,
ii) different phrase-prosodic contexts.

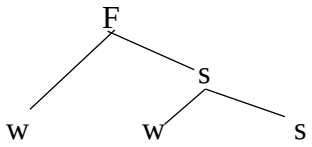
The prominence relations between syllables are defined by a (binary branching) tree, where the two branches from a node are labelled as dominant (s = strong) and recessive (w = weak) in their relation to each other. Four (quasi-independent) choices (are assumed to) determine the stress patterns that (appear to) exist in natural languages:

i. Right-dominant-foot vs. left-dominant-foot languages
ii. Bounded vs. unbounded stress
iii. Left-to-right vs. right-to-left word-stress assignment
iv. Quantity-sensitive vs. quantity-insensitive languages

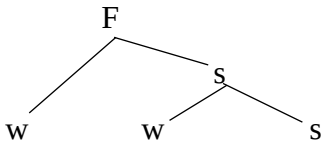
5.2.2 Right-dominant vs. left-dominant

Languages differ in the tendency for the feet to have the strong syllable on the right or the left. Let us look at the following examples and distinguish between French and English:

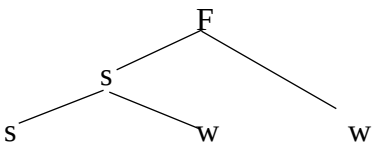
French: sympho[I]nie



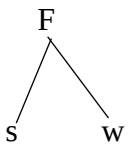
fantas[I]tique



English: [I]Buckingham



[I]Palace



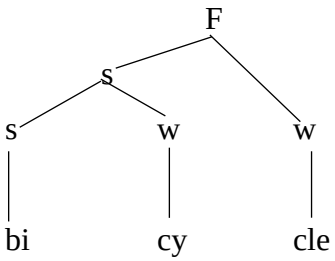
5.2.3 Bounded vs. unbounded stress (1)

"Bounded" (vs. "unbounded") is a concept that applies to the number of subordinate units that can be dominated by a higher node In metrical phonology it applies usually to the number of syllables that can be dominated by a Foot node (bounded = 2; one strong, one weak syllable to

the left or the right; unbounded = no limit). This implies that bounded-stress languages have binary feet. It also implies that bounded-stress languages have the word stress close to the (left or right) word-boundary. However, it is sometimes applied to the stress pattern within a word, i.e., that a word has ONE stress (either at the left or right boundary), and can have more than one unstressed syllables. This is NOT always understood as a non-binary tree; some assume binary branching, but the tree is left- or right-dominated.

5.2.4 Stress assignment (left/right)

Independent of the left or right dominance in the foot, word stress can be assigned (in unbounded languages) from the left or right edge of the word. The consequences of this would be noticeable in words with an odd number of syllables with the same foot dominance (or with a different dominance and the same assignment direction).



Which dominance condition in the foot, and which stress assignment direction can we deduce for the English word ‘bicycle’?

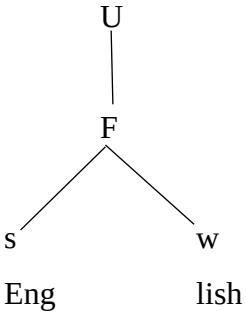
5.2.5 Quantity sensitive languages

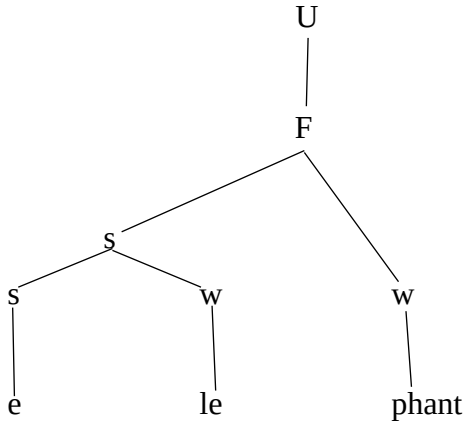
Languages that are quantity sensitive assign the stress to a heavy syllable (if present) English (and German) are considered quantity-sensitive languages; French is considered to be quantity-insensitive. This requires a stressed syllable to be a heavy syllable = either CVV or CVC(C)

5.2.5 Metrical Structure and Metrical (Grid-) Structure

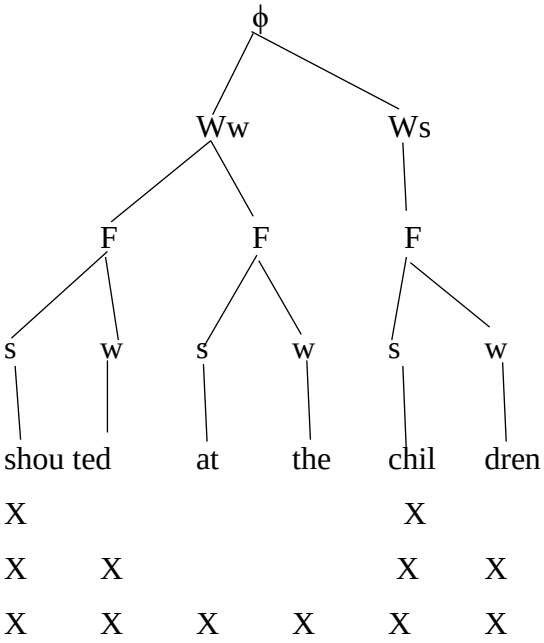
Liberman and Prince (1977) proposed a tree structure for representing word and phrasal stress patterns.

We can look at the following words and phrases.





One way of seeing the metrical grid structure is the sum of the strong and weak nodes along the branches to the end-leaf. Examine the following:



I hope you are able to determine the weak and strong syllables in any given stretch of speech in your language of study.

5.2.6 The well-formedness conditions (principles)

A word may be phonologically **well-formed**. This means that it conforms to the sound pattern of the language. Selkirk (1984) proposed two sets of rules:

i. Text-to-Grid Alignment rules (TGA)
ii. Grid Euphony rules (GE)

Under TGA rules Selkirk suggests:

a) word-level rules
   i. each syllable receives a demibeat
   ii. heavy or root-initial syllables receive a beat (Basic Beat Level)
   iii. the rightmost 2-beat syllable receives a beat (Main Stress Rule)

b) higher-level rules
   i. the leftmost constituent of a compound (i.e. 2 or more word units) receives a beat (Compound Stress Rule)
   ii. the rightmost constituent with lexical stress receives a beat (Nuclear Stress Rule)
   iii. pitch accent syllables receive an additional beat to raise their prominence (Pitch Accent Prominence Rule)

Selkirk's stress rules (The Grid euphony rules)
Grid euphony rules adjust the output of the grid alignment rules to achieve an ideal grid. The principle of the ideal grid is the Principle of Rhythmic Alternation where;

- every strong position should be followed by a weak position
- no weak position should be preceded by more than one weak position.

http://www.coli.uni-saarland.de/~steiner/teaching/2007/summer/phonologicaltheories/pt07_06.pdf (22.05.2020).

Activity 5.1

1. Compare and comment on the syllable structure:
   English: solid [ˈsɒlId] vs. solidify [sɔˈIdIfaI]
2. Draw metrical trees for each.

Summary

This unit has dealt with the CV and Metrical theories of phonology. It is important to relate each of these theories to the earlier discussed theories and compare the principles that govern each of them.

UNIT SIX

MORPHOLOGICAL TYPOLOGY

6.0 Introduction

Morphological typology is the categorisation or classification of languages according to their morphology or according to the extent in which words are divisible into individual morphemes. You may realise that languages differ in the way they combine morphemes. We are going to look at the five types.

Learning Outcomes

By the end of this unit, you are expected to;

- explain the various morphological typologies.
- distinguish morphological typologies from each other.
- categorise the languages in the typologies.
- classify the languages of study

6.1 Analytic languages/ Isolating

In isolating languages, words are mostly mono-morphemic. An example of such a language is Vietnamese. There is a one-to-one correspondence between words and morphemes. Lieber (2009) states that isolating languages are purely analytic and allow no affixation at all whether they are inflectional or derivational. Another important feature of isolating languages is that words are mostly invariable. What this means is that there no morphological variations in a sentence. Other than that, words in isolating languages are monosyllabic. This means that one can hardly find a word in such languages that is made up of more than one syllable.

Analytic languages show a low ratio of words to morphemes; in fact, the correspondence is nearly one-to-one. Sentences in analytic languages are composed of independent root morphemes. Grammatical relations between words are expressed by separate words where they might otherwise be expressed by affixes, which are present to a minimal degree in such languages. There is little to no morphological change in words: they tend to be uninflected. Grammatical categories are indicated by word order (for example, inversion of verb and subject for interrogative sentences) or by bringing in additional words (for example, a word for "some"

or "many" instead of a plural inflection like English -*s*). Individual words carry a general meaning root concept; nuances are expressed by other words.

6.2 Agglutinative languages

Agglutinative languages have words containing several morphemes that are always clearly differentiable from one other in that each morpheme represents only one grammatical meaning and the boundaries between those morphemes are easily demarcated; that is, the bound morphemes are affixes, and they may be individually identified. Agglutinative languages tend to have a high number of morphemes per word, and their morphology is highly regular (Comrie, 1987). In agglutinative languages, words are easily construed. In such languages, the sequences of affixes have a very clear-cut boundary. Not only is it easy to distinguish the root from the affixes, even the affixes usually have a clear boundary. Examples of agglutinative languages are the Bantu languages which attach several morphemes to the root or stem.

6.3 Synthetic languages/ Fusional languages/ inflecting languages

A fusional language, like an agglutinative language, allows complex words, but its morphemes are not necessarily easy to segment. Several meanings may be packed into each morpheme. The relational meanings for fusional languages are expressed by affixes. Fusional languages sometimes allow the same physical morph to express more than one morpheme resulting in portmanteau morphs. This feature sometimes makes it difficult for one to distinguish where one morpheme ends and another one starts, (Lieber, 2009:133)

6.4 Infixing languages

According to Yu (2007), words in infixing languages are usually made up of consonants only. This means that the root would consist of just consonants where this is used as a skeleton which is fleshed out with a variety of vowels in the formation of word forms. Arabic and Hebrew are good examples of infixing language. As in the case of Hebrew, a common word YHWH the name of the God of the Jewish people. It has no vowel and can be fleshed out with the insertion of some vowels to make “YAHWEH”. One other language is Latin which uses the root ktb to produce many words and expressions through infixing vowels as well as attaching prefixes and suffixes to the root with vowels. Let us have more examples from Latin:

a) Adding vowels to the root
   katab ‘he wrote’
   kattaba ‘he caused to write’

kutiba ‘it was written’

ktataba ‘’he copied’

ka:taba ‘he corresponded’

b) Adding prefixes to root (with vowels)

maktab ‘an office’

nkatab ‘we write’

maktu:b ‘a letter’

maka:tib ‘offices’

c) Adding suffixes (with vowels)

kitabun ‘a book’

kita:batun ‘act of writing’

kutta:bun ‘Quran school’

From the examples above, you are able to see that words in Latin are formed by infixation.

6.5 Polysynthetic or Incorporating languages

Polysynthetic languages often display a high degree of affixation and fusion of morphemes. This means that there is a high number of morphemes in a particular word. In polysynthetic languages, what can be expressed as a sentence in other languages, can be expressed as a single word in a polysynthetic language. It is worth noting that it is not the case in polysynthetic languages that every sentence is just a word. This is usually done by incorporating the subject and object nouns into complex verb forms. In other words, there is a high degree of agglutination with almost every relational meaning even that of objects being expressed in the form of incorporated objects as well as in the form of affix. Polysynthetic languages are primarily found among Eskimo and American Indian languages, as well as a few languages in Sibir, Northern Caucasus and Australia, https://www.uio.no/studier/emner/hf/ikos/EXFAC03-AAS/h05/larestoff/linguistics/Chapter%204.(H05).pdf (22.01.2020).

A polysynthetic language is a language where words are made with lexical morphemes (substantive, verb, adjective, etc) as if parts of sentences were bound together to constitute one word, which can sometimes be very long. Those “words” will be translated by several words or even by a complete sentence for less synthetic languages such as English as exemplified in Iñupiak-inuktitut, a language of the Eskimo-Aleut family in North America:

Tusaatsiarunnanngittualuujunga “I can’t hear very well”.

This word could be broken down as follows: the root **Tusaa**– (“to hear”) followed by 5 suffixes: **tsiag**– (“well”), –**junnag**– (“to be able to”), –**nngit**– (negative form), –**tualuu**– (“a lot”), –**junga** (marker of the first person and present tense).

Polysynthetic languages are usually agglutinative. Note the morphological processes that occur when the affix –junnag- ‘to be able to’ above is attached to other morphemes.

http://www.sorosoro.org/en/2015/09/polysynthetic-language/ (22.01.2020).

Activity 6.1

1. Discuss the five morphological typologies of the world languages.
2. What type is the language you are studying in this course? Justify.

Summary

In this unit, you have been exposed to the morphological typologies of languages. What you should bear in mind is that there is no language that would qualify in each of the language typologies discussed, but each of them would encompass two or more of these types. For instance, English is an isolating language but we see most of the regular verbs and nouns forming their tense forms and plurals, respectively, by affixation which is typical of inflecting and agglutinating languages.

UNIT SEVEN

MORPHOLOGICAL STRUCTURE

7.0 Introduction

Typically a word will consist of a root or stem and zero or more affixes. Here, we are going to look at the structure of nouns and verbals. We are using the term 'verbal' as it will apply to Zambian languages constituents since the verb in these languages includes other elements as you will see later. Various languages will have specific structures of nominals and verbals.

Learning Outcomes

By the end of this unit, you are expected to;

- describe the morphological structure of both English and Zambian languages nominals.
- describe the structure of verbals in English and Zambian languages.
- distinguish English nominal structure with that of Zambian languages.
- distinguish between English and Zambian languages verbals.

7.1 Nominals

Nominals are noun-like constituents. This will apply to Zambian languages where adjectives will be part of the discussion. Nominals are made up of stem and an affix (prefix, suffix) whether overt or covert. The English noun has the structure Stem + Suffix. The singular does not have an explicit suffix. It is covert. For examples;

dog + s → dog-s.
book + ∅ → book-(zero affix) => book

What it implies for the affix in the singular forms is that there is a zero suffix (invisible but valuable) which denotes singular.

There are two structures for Zambian languages nouns. The structure of nouns in augmentless Zambian languages is Prefix + Stem. For example;

Nyanja: mu + nthu => munthu'person'

Lozi: mu + una => muuna ‘man’

Tonga: ka + longa => kalonga ‘small river’

In augment languages, the structure is Augment + Prefix + Stem. For example;

Bemba: a + ba + ntu => abantu ‘people’

There are three major types of morphological structure of adjectives in Bantu, and these are as follows:

a. Prefix + Stem
b. Augment + Prefix + Stem
c. $Prefix_1$ + V + $Prefix_2$ + Stem (V = vowel).

These are underived and non-compounded. Are you able to provide examples for each of these? If not all, you can provide for your language. It is important to note that the adjective structure in (b) is only found in those languages in which the basic morphological structure of nouns (which they qualify) is also Augment + Prefix + Stem.

As shown in (1), (2) and (3), below, Tonga and Kaonde have the morphological structure of primitive as the one in (a), typical of that of the nouns in these languages, while in Bemba it is the one in (b), like nouns (in general) in the language.

1) Tonga: musamu **mupati (mu-pati)** (Prefix + Stem) ‘big tree’
   N Adj
   ‘tree’ ‘big’
2) Kaonde: kichi **kikatampe (ki-katampe)** (Prefix + Stem) ‘big tree’
   N Adj
   ‘tree’ ‘big’
3) Bemba: i-ci-muti **i-ci-kalamba** (Augment + Prefix + Stem) ‘big tree’
   N Adj
   ‘tree’ ‘big’

A noun consisting of two or more stems joined together is called a compound noun. English has many of these while Zambian languages have fewer of these in the lexicon. Compounds whose meanings can be got from the two constituents are termed transparent while those whose meanings cannot be got from the two stems are opaque. For example, classroom has semantic transparency whereas red-tape has semantic opacity.

7.2 Verbals

The structure of verbs in English is the same as that of nouns. The root is followed by an inflectional and (or) derivational suffixes.

The verb in Zambian languages, as already seen, is the most complex word class. The unit will discuss the morphemes that make up a complex verbal in Zambian languages. Generally, the verbal system of a Zambian language is more complex than that of English because Zambian languages are agglutinative. In this typology, a number of morphemes are glued together in such a way that one verbal constituent can express a syntactic thought (where English uses three or six words, for instance, only one word can be used in Zambian languages). Indeed, verbals in Zambian languages are the most complex of all the word classes. Verbals are made of a core (radical) to which various affixes (prefixes, infixes and suffixes) are attached. The following are the major types of verb morphemes in these languages (appearing in that order):

a. Preprefix
b. Prefix (subject marker/ concord prefix)
c. Post prefix
d. Tense sign (tense marker)
e. Post tense sign
f. Infix (object marker)
g. Radical (root)
h. Extension
i. Pre-ending
j. Ending (suffix)
k. Post ending.

Now, let us look at each of the verbal elements in some of the Zambian languages.

7.2.1 Prefix

The prefix in the verbal constituent is the subject marker. It basically refers to the subject. However, there are cases where the prefix does not refer to the subject. Let us consider the following examples from Tonga:

Tonga: a) basika ‘they have arrived’ (cl.2)

b) zyasika ‘they have arrived’ (cl.8/9)

c) muminzi muli bantu ‘in the village, there are people’

In examples (a) and (b), the prefixes ba- and zi- (zi-a > zya) refer to the subject while mu- in (c) refers to the locative, hence the prefix does not refer to the subject. Compare also the Bemba expression: ukulima kwalyafya 'farming is difficult'

7.2.2 Preprefix and post prefix

The term preprefix is anything preceding the prefix in the verb form. In many languages, the preprefix denote negation. In some languages, the prefix carries some mood and aspect in the verb. The genitive pronoun is also a preprefix as discussed already in Unit 15. The post prefix is a morpheme that immediately follows the prefix. It may denote negation in some languages or tense and aspect.

Tonga: a. tababali 'they do not read'

b. nobatabali... 'when they do not read...'

In (a) above, the preprefix is ta- (denoting negation) while in (b), the preprefix is no- (expressing a temporal mood). Note also that the negative morpheme ta- in (b) is a post prefix.

7.2.3 Tense-sign, ending and post ending

The tense-sign morphemes are cumulative morphemes denoting not only tense but also other grammatical categories such as mood and aspect. There is also a view among some Bantuists that tense-signs and **verb endings** go together.

Tonga: a) balabala 'they are reading'

b) tababali 'they do not read'

c) babale 'they should read'

In (a), -la- carries tense; present, and aspect; progressive) and the ending is –a (indicating the indicative mood). In (b), the morpheme ta- and –i denote negation (because the ta- and the –i are set apart by the verb root, this kind of morpheme is termed a ***discontinuous morpheme*)**. In (c), the ending –e denotes the subjunctive mood. Morphemes that express more than one grammatical notion are called ***cumulative morphemes***.

The post ending is a verbal morpheme that comes after a verb ending.

Nyanja: abweranso 'he/she has come again'

In the Nyanja example above, the morpheme -nso is a post ending.

7.2.4 Post tense sign

The post tense sign is a morpheme that follows the tense sign; denoting aspect.

Bemba: a) tukalemba ‘we will write’

b) tukalaalemba ‘we will be writing’

(-ka- is a future tense-sign while -laa- is a morpheme denoting the progressive aspect)

7.2.5 Infix

An infix is a morpheme that is inserted in another form. In most Bantu languages, the infix is inserted between the subject prefix and the verb root. The other terms used are: object infix, object prefix, object marker; and refer to direct or indirect object.

Luvale: banamumoono ‘they have seen him/ her’ (-mu- is the object marker, so it is an infix; cl.1).

7.2.6 Radical and Extension

We hope that by now you have already known what a radical and radical extension is. Just to remind you, the radical which is also called the root is the core element in a verbal constituent. It is the only morpheme that is present in all the word-forms of the verb constituent. It is an irreducible element of a verbal. The verb extension is that part of the verb that adds extra meaning. It is usually infixed between the verb root and the verb ending.

A verbal will minimally have two elements (eg. pa-a > pa ‘give’ in Tonga) while in English, it will have one (eg. cut). The verb form in our Zambian languages can constitute any of the eleven morphemes as indicated in the following template, with the example *nibatakalikumubambililide* ‘when they had not been caring for him/ her’ in Tonga.

Verb form template with an example from Tonga (Adopted from Sikota, 2017).

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Pre-SM	**SM**	**Neg.**	**TM**	**Asp.**	**OM**	**Root**	**EXT**	**Pre-ending**	**END**	**P/END**
ni-	***-ba-***	***-ta-***	***-aka-***	***-liku-***	***-mu-***	***bamb-***	***-ilil-***	***-id-***	***-e***	
when	**They**	**Not**	**pHp**	**PROG**	**him/her**	**Care**	**For**	**Perf.**	**IND**	

The most important verbal slots are 7, 10 and 2 (in this order). For instance, the imperative comprises slot 7 and 10 only. In this case, the ending would be *–a*.

Activity 7.1

1. Discuss the structure of nominals in both English and Zambian languages.
2. What is the structure of verbals in English.
3. What is the structure of verbals in Bantu languages?
4. Segment the following verbal expressions and categorise them:

Bemba: i. tabaciya ‘they have not gone’

i. baleelima ‘they used to cultivate’

ii. tabamonana ‘they do not see each other’

Nyanja: i. tidzakaapedza ‘we will find them’

ii. anagonjedza ‘they conquered’

iii. ndidzamugulila ‘I will buy for her/him’

It is important to discuss your solution to these with members on this course or any knowledgeable person in this field.

Summary

In this unit, we have looked at the structure of both English and Bantu nominals as well as verbals. We have used the term ‘verbals’ to include the phenomenon of the constituents in Bantu that include to the verb, elements such as subject marker, tense marker, object marker and extension. We have seen that the verbal in Bantu is quite complex as compared to the English language verb. Nouns are also complex because of the prefixes that form the class system and agreement in Bantu.

UNIT EIGHT

MORPHOLOGICAL PROCESSES

8.0 Introduction

This unit deals with morphological processes. There are so many morphological processes but what is covered in this unit is affixation, internal change, suppletion, zero modification, reduplication, compounding, and tone and stress shift.

Learning Outcomes

By the end of the unit, you are expected to;

- explain the various morphological processes in word formation process.
- explain some of the functions of reduplication.
- distinguish between transparent and opaque compounds.
- differentiate tone from stress.

8.1 Affixation

This is not the first time you are coming across the term. You dealt with it as a word formation process. Can you explain what it is?

Affixation is a morphological process whereby an affix is attached to a morphological base. Affixes do mark derivational and inflectional changes. Affixation is the most common strategy that human languages employ for derivation of new words and word forms. In most agglutinative and inflectional languages, affixation is the most prominent process by which words are formed. Diachronically, the English word affix was first used as a verb and has its origin in Latin: affixus, past participle of the verb affigere, ad- 'to' + figere 'to fix'. Affixation deals with morphemes which are either roots or stems and bound affixes. Prefixes (affixes that precede the root or stem) and suffixes (affixes that follow the root or stem) are the most common types of affixes cross-linguistically. We can derive 'work-er' from the verb 'work' and inflect the verb 'work' as works, worked or working. In most Bantu languages, inflection is by prefixation while derivation is by suffixation. We can inflect the singular noun '*u**mu**ntu*' in Bemba to plural '*a**ba**ntu*', but derive the noun *umulim**i*** 'farmer' from the verb *lima* 'cultivate'. Note the prefixes *mu-* and *ba-* in inflection and suffix *-i* in derivation.

8.2 Internal change

Think of the languages discussed above under morphological typology. Which of those depend on internal vowel change? To what extent does English employ this process? Well. Internal changes are morphological processes that alter a word's internal structure. Such changes can affect vowel quality, or otherwise alter the shape of the word. Internal vowel change takes place in the inflection of nouns, essentially irregular nouns. In infixing languages, however, the word internal process can be used to produce constructions above morphology. For instance, in Egyptian Arabic, *kitab* is 'book' but *katab* means 'he wrote'. Internal change is a non-concatenative process. This means that you cannot follow a particular order to determine the word production process and meaning.

8.3 Suppletion

Have you ever come across the term suppletion? What suppletion? Suppletion is the use of two or more phonetically distinct roots for different forms of the same word, such as the adjective bad and its suppletive comparative form worse. The roots 'bad' and 'worse' are not cognate (they are different). These roots resist to the pressure of paradigmatic levelling. Roots of regular comparatives can form a paradigm. You can give as many examples as you can in the English language.

8.4 Zero modification

A zero morph, consisting of no phonetic form, is an allomorph of a morpheme that is otherwise realized in speech. Similarly, a zero inflection is an unrealised inflection, such as in nouns with identical singular and plural forms. For example, plural of **sheep** can be analysed as 'sheep-∅' and the past form of **cut** is 'cut-∅'. In each of these morphological processes, there is zero modification.

8.5 Reduplication

Reduplication is a morphological phenomenon in which the base, root or stem of a lexeme or a part of it is repeated completely or with a slight change. The word 'base' is an alternative to root or stem that indicates the indivisible unit attached to different affixes (Katamba, 1993: 45). Which of the words in the sentences below are reduplicated?

i. He has an old-old view.
ii. A murmur of disagreement ran round the room.

Obviously, fully reduplicated bases are rarely found in English. In some cases, they are borrowed. Can you think of some reduplicated bases in English? What are the categories of each of the lexemes that you have come up with? In what we will call 'Zambian English, we hear people say, 'small-small', 'high-high', etcetera, which a speaker of Standard English would disapprove. Zambian languages have high productivity of reduplication. Nearly all verbals can be reduplicated with a meaning of 'anyhow' or 'repeatedly' or 'all over'. For example:

Tonga: cisekeseke 'laughing anyhow'
kulemba 'to write' => kulembalemba 'to write repeatedly'
kulyatalyata 'stepping all over'

As can be seen, there is partial reduplication. Further, the link of reduplication is suffixation. Some languages of the world can prefix as well as infix reduplication. Zambian languages do have full reduplication as can be exemplified in Tonga below:

Tonga: pwaya 'break' => pwayapwaya 'break into pieces'

One may want to distinguish type of an aspect, eg,

Tonga: cilyo-lyo 'junk food' from cilyo 'food'.
muntuntu 'common person' from muntu 'person'.

Reduplication can serve many functions in some languages, from making plural forms to marking intensity or diminutives. Compare the following:

Thai:	di: 'to be good'	dí:di: 'to be extremely good'
Tonga:	bbotu 'good'	bbotubotu 'quite good'/ 'fairly good'
	pati 'big'	patipati 'relatively big'
	asyoonto 'small'	asyoonto-syoonto 'in small phases'

8.6 Compounding

Compounding is a word formation process based on the combination of lexical elements (words or stems). Compounding can be grouped into four main areas; delimitation, classification, formation, and interpretation. In the delimitation of compounding, one question is how important it is to be able to determine for each expression unambiguously whether it is a compound or not. Compounding borders on syntax and on affixation. We may have more typical and less typical instances, without a precise boundary between them. However, if, for

instance, word formation and syntax are strictly separated and compounding is in word formation, it is crucial to draw this borderline precisely. Further, criteria based on form, on syntactic properties, and on meaning may be used. Whichever criteria, it cannot be applied cross-linguistically.

In the classification of compounds, a common classification uses headedness as a basis. Other criteria are based on the forms of the elements that are combined (e.g., stem vs. word) or on the semantic relationship between the components. Again, these cannot be applied cross-linguistically.

Under formation, compounds are generally thought of as consisting two components, although these components may consist of more than one element themselves. For some types of compounds with three or more components, for example copulative compounds, a non-binary structure has been proposed. Morpho-syntactic criteria take as their starting point the structure of the compound. Usually, a structure such as the notation below is assumed.

[XY]z

Adopting the binary structure in the form [XY]z means that compounds with more than two basic components, for example; church history textbook, are the result of recursion, as indicated below:

[[church history] [textbook]].

For certain types of compound, for example; philosopher-singer-songwriter, such an analysis is rather unnatural, because the choice between the possible orders of combination is arbitrary. However, [XY]z gives a good basis for discussing morpho-syntactic properties of most compounds.

One relevant issue is the status of X and Y. There is a need to identify the head. For instance, which one is the head in ‘postman, careful, passer-by’ and blacksmith? Which part of the compound can be inflected? Although English normally have right hand head in compounds, there is a small minority of endocentric compounds with left hand heads such as passer-by, mother-in-law and grant-in-aid.

In English language, Y is usually the head of the compound. However, compounds, whose heads are X attach the inflection to the first component.

There is a slightly different case is genitive inflection, for example;

children's dictionary

The English genitive above is ambiguous. The ambiguity can be resolved in various ways. One of them is by means of agreement with the determiner, as in the example below:

a. this [α children's dictionary]
b. [β these children]'s dictionary

As indicated by the brackets, this in (a) determines the bracketed complex expression α, whereas these in (b) is part of the noun phrase β. Therefore, 'children's dictionary' may be considered a compound in the contexts such as (a) but not in contexts such as (b).

By interpreting what is being talked about or referred, we are able to state the focus of the compound. For instance, our interpretation of chalkboard is that we can distinguish this kind of board from all the other kinds such as chipboard, ceiling board, head board etcetera. I hope you have covered headedness also in syntax.

We can determine whether the compounds in our local languages are of right hand headed or left hand headed rule. Examine the Bemba and Tonga compounds below:

Bemba: kaminamisa 'one who swallows rapidly'
Tonga: mulyakubinda 'one who eats hurriedly'

In each of the two, the compound is determined by the left hand constituents; mina 'swallow' and -lya- . Can we conclude that Tonga and Bemba compounds are left hand headed?

8.7 Tone/ stress shift

Here, stress and tone will refer to English language and tone alone to Zambian languages. The stress and tone placement in the word is dividing its function as a noun (stressed on the first syllable), and as a verb (stressed on the second syllable). Stress is represented by a superscript. Morphological processes alter stems to derive new words. They may change stress placement and tone. A shift in stress and tone can also be used to change a word's grammatical function or meaning.

noun	**verb**
ˈre.fuse	re. ˈfuse
ˈcon.duct	con.ˈduct
ˈre.cord	re.ˈcord
ˈex.tract	ex.ˈtract

The superscript in the words presented above indicates that the stress falls on the syllable that follows.

http://www.linguisticsnetwork.com/morphological-processes-101/ (09.08.2020).

As already indicated, tone is a feature in Zambian languages. It is a distinctive element, differentiating one lexeme (word) from another. Tone bearing units are vowels and, in some languages, certain consonants in some positions. Tone bearing units in the seven Zambian regional languages are vowels and word-initial nasals of prenasalized consonants (eg. words with mb, mp, nt, nd, ng, nd etc).

There are two main types of tones: register tones and contour tones.

(a) **Register tones,** also called Simple tones. Register-tone languages use tones that are level; i.e., they have relatively steady-state pitches, which differ with regard to being relatively higher or lower. The following are the tones types, although the common ones in the seven Zambian languages are high and low:

i. **high tone** (H), symbolized by the acute accent on top of the tone bearing unit, as illustrated in **á**;
ii. **low tone** (L), symbolized by the grave accent, as illustrated in **à**; and
iii. **mid tone** (M), symbolized by a short vertical line on top of the relevant segment.

(b) **Compound tones**, also called **contour tones**, which are combinations of level tones. Two sub-types of this kind are exemplified below:

i. **High-low** (HL) falling tone, for example the tone of the first syllable in the Bemba word **ninkwata** [nî:ŋkwátá] ‘I have, I am holding’ (If you don’t speak Bemba, ask a Bemba speaker to pronounce the word), or in the second syllable of the Nyanja

word for ‘tree’, **mtengo** [mtêŋgò] (If you do not speak Nyanja, ask a Nyanja speaker to pronounce the word), ;

ii. **Low-high** (LH) rising tone as in Tonga: **gwala** [gwăla] ‘mark’

Note the following:

(a) Contour tones, although they are distinctive, will be treated as mere combinations of level tones;

(b) No distinction will be made between high and mid tones in transcriptions;

(c) Except in phonetic transcriptions (these signalled by square brackets), low tones will not be marked; and

(d) In phonemic transcriptions, contour tones on long vowels will be symbolised as shown in **áa** (long ***a*** with a falling tone), **aá** (long ***a*** with a rising tone); in phonetic transcriptions they will be: symbolised as shown in **â:** (long ***a*** with a falling tone), **ă:** (long ***a*** with a rising tone).

Look at examples on tonal contrasts:

Bemba:

a. úkubómbá ‘to work’
b. ukúbómbá ‘to be/become wet/soaked’

a. ímpanga ‘forest/bush’
b. împánga ‘sheep’

a. ukúlúká ‘to plait’
b. úkulúká ‘to vomit’

Kaonde

a. ubeena kujima ‘he/she is cultivating’
b. úbeena kujima ‘you-sg are cultivating’
c. ubeenâ kujima ‘(the one) who is cultivating’

Lozi

a. liheta ‘shoes
b. lihéta ‘shoulder’

a. kusíla ‘to cross’

b. kusila ‘to crush’

Lunda

a. mukanda ‘circumcision (camp)’
b. mukânda ‘letter’

a. /wáálanda/ ‘you-sg have bought’
b. /waalanda/ ‘he has bought’

Luvale

a. mukanda ‘circumcision (camp)’
b. mukânda ‘letter’
a. kufula ‘to dig up’
b. kufúla ‘to forge’

Nyanja

a. mtengo ‘price’
b. mtêngo ‘tree’

Tonga

a. ulabona ‘you-sg see’
ulábona ‘he/she sees’
b, cíbándá ‘plain’
cibanda ‘molar’
c. cilundu ‘lump’
cílúndú ‘hill’

You can provide as many examples as you can to show that most Bantu languages are tonal, although there are some Bantu languages that highly dependent on tone.

Activity 8.1

1. Affixation appears to be the most productive word formation process. With examples from English and any Bantu language, justify this claim.
2. Tone and length are said to be distinctive. Illustrate.
3. Illustrate the concept of reduplication in Language.

Summary

So many processes have been discussed in this unit. What you are required of is to examine how each of these operate in the language of study. Distinguish also how each of these operate in English and in some of the Zambian languages or any other Bantu language.

UNIT NINE

LEXICAL MORPHOLOGY

9.0 Introduction

We will discuss the lexical morphology as an aspect of a model that deals with interaction between phonology and morphology, hence the term 'phonology-morphology interface. The unit endeavours to use the model in the presentation of morphological aspects in Zambian languages.

Learning Outcomes

By the end of this unit, you are expected to;

- distinguish between neutral and non-neutral affixes in a language of study.
- discuss the basic principles of lexical morphology model.
- analyse various words using the lexical morphology model.

9.1 The Model

The lexical morphology model has application in the English derivational and inflectional morphology. The word is the key unit of morphological analysis. There is a symbiotic relationship between morphological and phonological rules. The theory believes that the morphological component of grammar is organised in hierarchical strata (layers or levels) based on affixes. This is the central principle of lexical morphology. English affixes can be grouped into two broad categories or classes based on their phonological behaviour: neutral and non-neutral.

9.2 Neutral and non-neutral affixes

The neutral /non-neutral distinction corresponds to the more traditional distinction between primary and secondary affixes where neutral affixes are secondary affixes and non-neutral primary as well as the classic distinction of weak boundary (♯) between neutral suffix and base vs. strong boundary (+) between non-neutral suffix and base in SPE.

9.2.1 Neutral Affixes (Secondary affixes)

Neutral affixes do not have phonological effect on the base to which they are attached. Examples of such affixes are –ness and –less. In the pronunciation of the following lexemes, there is no change in the constituent with an affixed element. Try to sound these:

abstract => abstractness, serious => seriousness, bold => boldness, nude => nudeness

father => fatherless, power => powerless, home => homeless, care => careless

9.2.2 Non-neutral Affixes (Primary affixes)

These have effect on the segmental and (or) supra-segmental structure of the base to which they are attached. Examples include: -ic, -ity, -ee, -ion, etc. You can also examine the following:

‘strategy => stra’tegic, ‘morpheme => mor’phemic, ‘botany => bo’tanic,

‘pompous => pom’posity, ‘opaque => o’pacity, ‘brief => bre’vity

de’tain => detai’nee, em’ploy => emplo’yee, ‘absent => absen’tee

What you can notice from the set of non-neutral affixes is that in some cases both the segmental and supra-segmental form of the base is affected. As can be seen in the examples above, -ic and -ity are pre-accenting affixes. This means that the syllable before it is stressed. The suffix -ee, however, is an auto-stressed suffix. It attracts stress itself.

Activity 9.1

1. Provide the phonetic transcription of the adjectives; wide, broad, long.
2. What nouns can be derived from the adjectives in (1) above? Transcribe them.
3. Derive adverbs from them. Transcribe them too.
4. State whether the affixes used are neutral or non-neutral. Justify.

9.3 Basic principles of the Lexical Morphology Model

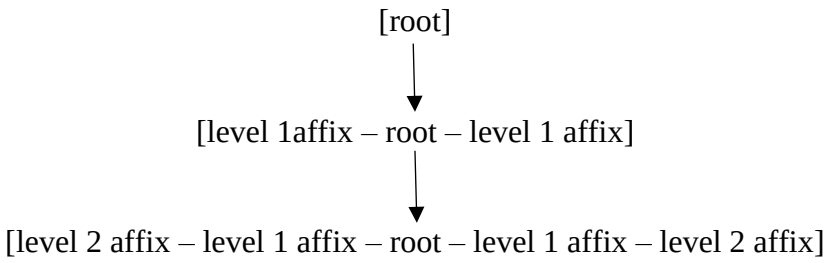
The following are the basic principles for the model:

i. Level ordering: affixes are added at different strata/ levels.
ii. Each stratum / levels has associated with it a set of morphological rules that do the word-building.
iii. The morphological rules are linked to phonological rules that indicate how the structure built by morphology is supposed to be pronounced.
iv. Underived lexical items are listed in the lexicon.

v. Primary affixes are attached at level 1.

vi. Secondary affixes and compounding are attached at level 2.

The following illustrates the way the principle works:



Note that level 1 affixes are always closer to the root while level 2 (i.e. neutral affixes are on the peripheral.

9.4 Ordering of affixes

In the word formation process which requires both neutral and non-neutral affixes, following the principles of the model, the non-neutral should be added first followed by neutral affixes. When you add non-neutral affixes, application of relevant phonological rules would follow. Now, examine the word building process below:

curious	[base]
↓	
curious-**ity**	[non-neutral affix (1st stratum)]
↓	
cur**io**sity	Application of relevant phonological rules
↓	
curiosity-**ness**	[neutral affix (2nd stratum)]
↓	
curiosit**i**ness	Application of relevant morphological rules
↓	
careless curiositiness	Rules of compounding (3rd stratum)
↓	
careless curiositiness**es**	Inflectional affix (4th stratum)
↓	
[keələs kjʊərɪɒsətines**iz**]	Application of relevant phonological rules

At fourth stratum, we have added a plural inflectional affix '-s'. Because it is added to the base ending with -ss (a sibilant), the rule is that we should add -es (phonologically '-iz') to the base. Remember that the purpose of this model is to produce grammatical words in the language and that if the stratum is not followed, it creates a problem. Consequently, it blocks the system of application of other affixes.

Activity 9. 2

1. Examine the following data from Kiparsky (1983):

Mendel	Mendel-ian	Mendel-ian-ism	*Mendel-ism-ian
Mongol	Mongol-ian	Mongol- ian-ism	*Mongol-ism-ian
grammer	grammar-ian	grammar-ian-ism	*grammar-ism-ian
Shakespeare	Shakespear-ian	Shakespear-ian-ism	*Shakespear-ism-ian

i. The suffix –ian is on level 1 because it is phonologically non-neutral. Explain.
ii. Is –ism a neutral or non-neutral suffix? Justify your answer.
iii. What is predictable about the ordering of these suffixes whenever they co-occur?

In Zambian languages, the affix which is non-neutral is –i. Let us look at examples in Chitonga and Icibemba below:

Bemba: -bomb- 'to work' => umu-bomb –i => umubomfi 'worker'
Tonga: -belek- 'to work' => mu-belek-i => mubelesi 'worker'

What we can see in the two examples is that the plosive breeds a fricative in the derivation of the nouns with -i. Note that there are fewer of such instances in the two languages.

You can now examine how affixes are attached in Zambian languages. In these languages, inflectional affixes are added before compounding.

Look at the Bemba example below:

Bemba:	ababomfi babuteko 'government workers'		
	-bomb-	**root**	-tek-
	-bomb- + -i	**non-neutral**	-ték + -o
	-bomfi	**phonological rules**	-teko
	aba + bomfi	**inflectional affixes**	ubu + teko

9.5 The Elsewhere condition

You may have already heard the term 'elsewhere' in the application of phonological rules. The elsewhere condition in lexical morphology is a condition which states that when applying morphological rules, one should start with the most restricted rules which applies to a narrow or specified set of words and end up with the most general rules which apply elsewhere. The condition therefore gives priority to restricted rules over general rules. For example:

morph +	-ology +	ic +	-al
	1	2	3

The application of –ology is restricted. It cannot be added elsewhere but must be added to the root. The application of –al, however, is general. It can apply elsewhere. The elsewhere condition was developed out of the realisation that some restricted rules would not be possible if any general rule was applied first. Try to apply an affix after you have applied the past tense marker '-ed' to the verb root in English language. It is impossible.

9.6 Bleeding and feeding

The concepts are used here with the notions they carry in their denotative meanings. A rule is said to bleed another if its application destroys the environment for the application of the other rule. A rule blocks another if its application destroys the environment for another rule to apply.

A rule feeds another if its application creates an environment or makes it possible for another rule to apply. Examine the following:

lexeme + -ic + -al: -ic feeds –al

lexeme + -al + -ic: -al bleeds ic.

Note also that restricted rules tend to be non-neutral and general rules tend to be neutral.

In terms of compounding in lexical morphology strata, it should occur at third stratum. It must come after non-neutral and neutral affixes have been applied. This implies that there are no cases of derivative affixes in English that use compounds as a base. One of the compound head would be the base.

Activity 9.3

1. Discuss the basic principles of the lexical morphology model.
2. Using the lexical morphological model, analyse the following constituents:
    i. antidisestablishmentarianism
    ii. decolonisation
    iii. antipatriotic
    iv. reconstructionists
3. Explain the rule bleeding and rule blocking phenomena.

Summary

In this unit, you have been exposed to a lot of concepts in lexical morphological theory. The theory operates with the lexical phonological theory. In some way, it can be viewed as the same theory although the morphological model has much focus on word formation while the phonological theory focusses on the sound output. In the unit, we have distinguished the various affixes that do apply at different strata. The non-neutral which are also primary in the model are applied before the neutral ones which are considered secondary. The primary ones are restrictive while the secondary ones are general. Although the model was designed for English, we have seen that it can be applied to other languages such as the Zambian and other Bantu languages.

I HOPE THIS COURSE HAS MOVED YOU TO ANOTHER LEVEL IN THE STUDY OF LANGUAGE. TO BE A SPECIALIST IN THE COURSES YOU HAVE DONE, READ MORE ON LANGUAGE, ESPECIALLY THE LANGUAGE OF YOUR STUDY.

ALL THE BEST!

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