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Place of Distinctive Features in Indigenous Languages: Sound Segments

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Abstract

This paper examines the place of distinctive features in phonology. It traces the development of distinctive features in phonology. It argues that the consonants differ from vowels. The use of features in phonological description reflects the dynamic nature of linguistic behaviour. It enumerates the various ways its impact is felt in indigenous languages sound segments. The theoretical framework is also presented. This paper, therefore, concludes that distinctive features are subject to revision or modification from time to time.

Keywords: Distinctive features, indigenous languages, sound segments.

Introduction

According to the international phonetic Association (IPA), phoneme was defined as "the smallest constructive linguistic unit that is significant for meaning" (Jones 1975). However, in the 21st century, linguistic knowledge later revised its analysis of the phonic material, and it was discovered that phonemes is made up of smaller linguistic units known as distinctive features. It is needed to turn a given word or utterance into another. For example, the two words in Yoruba; t`a (sold) and r`a (bought) as well in Hausa; ja (pulled) and sa (put) constitute a minimal pair since the sounds in their final position are identical, the only difference between them being in respect of the sounds in their initial positions, that is in Yoruba /t/ in t`a (sold) and r`a (bought) and in Hausa; /j/ in ja (pulled) and /s/ in sa (put). Since the substitution of /t/ for /r/ in Yoruba and /j/ for /s/ in Hausa causes a difference in the meaning, each of the sounds is on that account, a phoneme.

Phoneme is being referred to as sound segment (SS) in distinctive feature analysis. The generative phonologists

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argue that the phoneme is made up of smaller constituents called features. It is these features that are now labelled as distinctive features. Distinctive features are extracted features or abstracted because they are concerned as parts and parcel of the segment that bear them. Distinctive features are employed partly to distinguish between one sound and the other. They are also employed to describe the attribute and the quality of the different segment.

Theoretical Framework

This paper will rely on the assumptions and principles of Generative Phonology. This theory has been in use for the analysis of language for over four decades now. Its goal is to describe the intuitive knowledge of native speakers on how they use sounds to produce meaningful utterance. Therefore, pertinent to the concept of distinctive features in indigenous languages, the theoretical framework employed for the analysis is the principles of Generative Phonology. Sommerstein (1977) says of the theory "seeks to account for the principles that determine the pronunciation of languages and how the principles are universal". As such, principles of generative phonology can be used to investigate the ideological concern of the sound segments so as to understand their implications.

Historical Development:

Distinctive features have their origin in the theory of phonological oppositions developed by Trubetzkoy (1939) one of the founders of the Prague School of Linguistics. He attempted a comprehensive taxonomy of the phonetic properties of the distinctive contracts employed by languages. The theory of distinctive features was elaborated and radically transformed by Roman Jacobson (1896-1982), especially in the 1940s. For classical Prague School theory, features were merely dimensions along with which oppositions between phonemes may be classified.

All native speakers know which segments of their language contrast. Segments are said to contrast (on to be distinctive or be in opposition) when their presence alone may distinguish forms with different meaning from each other. The segments [s] and [z] contrast in the words: Sip and Zip as do the vowels of hit, hate and ho. Segments [s] and [z] are thus said to be distinctive sounds in English called phonemes. A basic test for a sound's distinctiveness is called a Minimal pair test. A minimal pair consists of two forms with distinct meanings that differ by only one segment which is their initial consonants.

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The examples [s] and [z] are the same in the place and manner of articulation. The only difference is that s = [- voiced] while z = [+ voiced].

Minimal pairs are established on the basis of sound and not spelling. Jacobson collaborated with the Swedish Acoustic aspects of oppositions, using the sound spectrograph, and was thus able to devise a set of acoustic or auditory labels for features such as 'graves', 'student', 'flat', etc. come into use.

The use of acoustic features enabled the distinctive feature theory to integrate the description of consonants and vowels within the same perspective. This was not possible through articulatory phonetics. The Acoustic character of features enables back and front vowels distinguished by the same feature, grave versus "acute", as velar and palatal consonants. The same feature "grave" may be used to group together labial and velar consonants on account of their "dark" quality and oppose them to both dentals consonants.

Another aspect of binary nature of feature oppositions: Binary means two. This means that there are two sides to every feature "+" or "-". In other words a sound or phoneme can only be described in terms of having or lacking a feature. Oppositions can be "bilateral" or "multilateral". For instance, the oppositions between /t/ and /d/ in English is bilateral. This is the same with /f/ and /v/. Both are distinguished by the feature ± voicing. Multilateral opposition is found in the case of p, t, k, that differ on the basis of point of articulation. Bilateral c, j, s, z.

Oppositions can also be private or gradual depending on whether it is a matter of presence or lack of presence and degree. The opposition between [p], [b] is privative while that between [i], [e], [E] in English or [u], [o], [a] in Yoruba in terms of height.

Roles or Why We Use Distinctive Features.

Distinctive features help us to describe all segmental contrasts in the world of languages. This is reflected in the fact that no two sounds carry the same set of similarity, it is always possible to distinguish sounds by using features for instance, in English [p] and [ph] are different only because one is aspirated, i.e. [ph] while the [p] is un- aspirated and can occur either medially or word finally. The phonetic differences is capture by the use of the feature [± aspirated].

The distinctive feature values are"relational", that is "±" is positive only in relation to

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"__". Each feature thus represents not an absolute property, but a relative one. This allows the same contrast to be located at different points on a scale. For instance in Danish there is a "strong" versus "weak" opposition which in initial position is found between a pair such as /t/ versus /d/, but which in final position is contained in the pair /d/ versus /o/. Though the same sound may be found on different sides of the opposition, in each case, it can be treated as the same opposition, since the first phoneme is "stronger" in relation to the second in both cases. Despite this relational character, however, Jacobson maintains that distinctive features are actual phonetic properties of the sounds, and not merely abstract labels, since "strength" in this sense is a definable phonetic property even if the terms of the opposition may be located at variable points along the scale. The feature itself remains invariant, the variation in its physical manifestation being non-distinctive.

The distinctive features, enables us to understand how segments influence one another.

A	B	C
im-possible	in-tolerance	iŋ-correct
im-purity	in-tangible	iŋ-congress
im-balance	in-discrete	iŋ-complete
	in-direct	iŋ-gratitude
	in-sufficient	iŋ-consistence
	in-op	iŋ-

We noticed that the phonetic form of the prefix meaning "not" is phonetically variant for each group. This could be explained with the attention to the place of articulation of the initial consonant of the roots, it is [in] before a vowel [o] an alveolar consonant, [im] before a labial consonant, and [iŋ] before a velar consonant. Since in all these cases the same prefix is added, the phonetic forms are predictable by one rule within a word, a nasal consonant assumes the same place of articulation as a following consonant. The rule can also be stated in another form as this:

N → [m] + bilabial
[n] + alveolar
[ŋ] + velar
Segments

The rule therefore states the class of phonemes to which it applies and where it is to be applied, this is an assimilation rule. The nasal assimilates its place of articulation to agree with the articulation of the following consonant. Thus the place of articulation features: [± labial], [±

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coronal], [± high] and [+ back] features here.

The assimilation process observed above is for instance, the progressive morpheme in the Yoruba and Hausa language is a syllabic nasal that has different forms depending on the place of articulation of the consonant after it. For example:

Yoruba	Hausa	English
mbo -	ina zuwa -	coming
nta -	ina sayarwa -	selling
nso -	ina magana -	saying
ŋge -	ina yanka -	cutting
ŋ-gu -	ina hawa -	climbing

Another character of distinctive features is its universal nature. One of the major objectives of the distinctive feature theory is to have a system of description that will work for all languages. Roman Jakobson, the inventor of the distinctive feature theory therefore came up with twelve major features, not all of which have the same importance across world languages. Some features happen to be more relevant to the description of some languages than others. Although all languages draw from the same universal set of features, individual languages draw from the same universal set of features, individual languages differ in the groups of features that make up their phonemes. For instance, the features [coronal], [lateral], [affricate] and [distributed] are all found in English, but they never occur together in a single phoneme.

To make another example, English does not have the feature of rounding in front vowels, but many European languages and indigenous languages do, among them: French, German, Hungarian, Finnish, Hausa and Yoruba languages. In other words, the set of universal distinctive features is a set that is available to all languages and combinations of features are actually found in each individual language.

Another significance of distinctive features is the hierarchical structure of oppositions. It enables us to know that all features are dependent on others, in the sense that they can only occur in a language if a certain other features are not present. This implies that if a language has feature B, it must also have feature A.

Jakobson (1941) supports this point with evidence from language acquisition and aphasia. He says that if a feature B can only occur in a language when another feature A is also present, then it follows that feature A must be acquired before feature B, and in aphasic conditions when control of oppositions is impaired, feature B will inevitably be lost before feature A.

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Distinctive features enables us to understand the redundancy criterion of sounds. Due to the individual peculiarities of languages, some features must not necessarily be specified by virtue of the presence of others. For instance, in both Yoruba, Hausa and English all nasals are voiced, so plus nasal [+ nasal] automatically means plus voice [+ voice] in that languages. Other languages that have voiceless nasals need to specify with [± voice]. Another example, is that all [± nasal] consonants are [+ continuant], hence [- continuant] consonants must be [- nasal], there are also no nasal vowels in English, hence [- nasal] is redundant for the vowel. All vowels are [+ continuant], and all non-tense phonemes are [+ voice], while neither vowels nor [- compact], [- continuant] consonants can be [+ strident]. We notice that redundancy also applies in sequences. If a phoneme with feature A must always be followed by a phoneme with feature B, then the latter feature is predictable, and therefore redundant for the second phoneme.

Distinctive features are useful in phonological description because they help in grouping sounds into natural classes. Any natural class require fewer features to define it than to define any one of its members. Thus, as the class becomes more general, the number of features required decreases.

When phonemes behave alike or are affected in same way, they are grouped together as a set of natural class. In other words, consonants are grouped together as distinct from vowels, stops are grouped together as distinct from fricatives, nasals belong to a natural class that is distinct from fricatives, and nasals belong to a natural class that is distinct from oral sounds. For example:

Fricatives are [+ consonantal]
[+ continuant]
Stops are [+ consonantal]
[- continuant]

Thus, as the class becomes more general, the member of features required decreases.

For example: /p/ [- compact]
[+ tense]
[- continuant]
/p,t,k,/ [+ tense]
[- continuant]
/p,t,k,b,g/ [- continuant]

On the other hand, any set of phonemes which does not constitute a natural class. For example: /ph/, /t/, /a/ cannot be grouped together using a number of features than is needed for any one of them.

Like the consonants, vowels also fall into natural classes. The high vowels as against

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the non-high, round vowels as against non-round, low vowels as against non-low etc. From the above explanation, consonants differ from vowels, as such the features required to distinguish consonants are always not applicable to vowels.

For example: i u [+ syllabic]
[+ high]
ɪ e ɜ [+ syllabic]
[- back]
[- low]
ɥ o ɔ [+ syllabic]
[+ back]
[+ round]
[+ low]
ɑ [+ syllabic]
[+ low]
[+ back]
[round]

This principle, together with that of redundancy, means that features are able to achieve generalizations which are not possible in the case of phonemes.

Distinctive features allow the use of an evaluation measure, simplicity metric, for descriptions based on the number of features used.

Another function of the distinctive features is the phonetic content of the features. The set of features required must have articulatory, acoustic or auditory correlates such as use of the feature Sonorant versus Obstruent in addition to vocalic and consonantal. Vowels, glides, nasals and liquids are [+ Sonorant], while the rest are [- Sonorant].

Another one is the use of the features anterior, coronal, high, back and low in place of “compact”, “grave”, “sharp” and some uses of “flat”, other uses of flat are catered for by other features, e.g. round.

Furthermore, distinctive features serve to distinguish phonemes as groups and at the same time to refer to classes of sounds. The role of distinctive features in the expression of phonological rules is also noticeable.

Recent Developments:

In the 1970s, generative phonology was more concerned with rule systems than with features and generally assumed Chomsky and Halle’s framework with only minor modifications and additions.

In recent years (1980s) new interest in nature of phonological representations and new developments in feature theory was witnessed. Individual feature tiers may be grouped together under place and manner of articulation which confirm that features behave as classes in phonological processes.

Conclusion

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Conclusively, the belief is that part of one's knowledge of a language is the knowledge of the sound system and the phonology of that language. The phonetic features are universal rather than specific to a particular language. The use of features in phonological description reflects the dynamic nature of linguistic behaviour. The use of features reflects a basic level of phonological activity contrasts that take place on the feature level, not on the level where segments are represented.

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