



Full Length Research Paper
**Pitch structures: The Western and African
 perspective**

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Abstract

Though music is almost part of every culture on earth, it varies widely among cultures in style and structure. No two pieces of music within the same musical culture and within the same musical sub-culture sounds similar. Evident within these music pieces are variance which may be similar and dissimilar during performances. What are these similarities and differences? The common central indices are the pitch structure. Different cultures different perspective of pitch structure, different sonic sounds and different aesthetics values. What is the perception of Western culture of pitch structure, what is the African perception of pitch structure? The discus shall be in two parts (a) concept of pitch: western and African perceptive and (b) scale: western and African perceptive - these form the thrust of this paper.

Keywords: Music, Western and African perceptive.

INTRODUCTION

There are principles and basic concepts shared by many African, Europe, American, Asia, South East Asia and the Middle East musical culture irrespective of their ethnic, linguistic, geographical cultural differences and variation. These principles and basic concepts help to establish a mark of identity when compared from one musical culture to the other, within the same musical culture and even within a subgroup. Their mark of identity lies in their pitch structure, hence the identity of a piece of music is ordinarily assumed to derive from the way that pitch is organized within it.

According to Webster's New Encyclopedia Dictionary (2002:1828), Structure is the arrangement of particles or parts in a substance or body's organization of parts as dominated by the general character of the whole or the aggregate of the element of an entity in their relationship to each other.

Pitch vis-à-vis structure has to do with the organization/arrangement of pitches (which is how high or low a sound is) depending on the vibration frequency within the peripheries of a given standard found in a particular culture or generally accepted standard operates modulates.

In trying to describe pitch structure of any musical culture, one would have to mind the following;

- what collection of notes belong together (in defining major and minor tonality)
- which notes from these collection are more important than the other and are likely to occur at the beginning or ending of succession of notes or melodies (in defining the tonal function – tonic, dominant o the different scale notes)
- which note collection may occur simultaneously with others (in defining triadic chord configurations)

- which similarities are functionally similar (in defining inversive and substitutive equivalence of chords)
- which keys are more closely related and which are more remotely related (in defining key relationship)
- the ways in which the tonal function of a melody determines which notes will succeed one another (as in rules of voice leading) and
- the way in which principles of combining notes in chords and melodies will interact (as in defining clustered, sparsely, tonal and atonal music)

Consequently, relations between sets of pitches termed as a pitch class sets (ordered and unordered) such as transposition, inversion and even reduction can lead to two different sets being regarded as more or less similar even though their constituent frequencies are different.

Describing sets and set types Rahn (1980:27), comments that the fundamental concept of musical set theory is the (musical set) which is an ordered collection of pitch classes. Pitch class sets are groups of pitch classes that have no real structure to them that are related to one another either by transposition or inversion.

Western tonal music uses twelve pitch classes each of which is represented in each octave of the entire range of pitches. Other musical culture like Asia and African cultures other than the twelve pitch classes, uses five pitch classes, two pitch classes, three pitch classes, six pitch classes, seven pitch classes as prevalent in their music typology.

PITCH CONCEPT: WESTERN AND AFRICAN PERCEPTIVE

Music is an intuitive natural phenomenon operating in the three (3) Words of Time, Pitch and Energy under the three distinct and interrelated organizational structures of Rhythm, Harmony and Melody. Music uses sound, sound is primarily a physical phenomenon around the propagation and perception of energy waves in a certain frequency range.

Pitch as one of the properties of sound, refers to the high-low quality of a musical sound. Pitch is determined by the frequency of tone (that is, the number of vibrations per second). According to Joseph (1984:27);

Pitch is the location of a tone in the musical scale in relation to high or low. Pitch is determined by rate of vibration which to a large extent depends on the length of the vibrating body. Other conditions being equal, the shorter a string or column of air, the more rapidly it vibrates and the higher the pitch, the longer a string or column of air, the fewer the vibrations per second and the lower the pitch. In other words, the height or depth of each note is its pitch. The physical origin of a note is vibration and it is the regular to and fro vibrations that produce musical sounds of a definite pitch while unmusical sounds are irregular and of indefinite pitch.

It has been argued and pointed out that no sound is irregular or unmusical for what is called or perceived irregular sound in one culture could mean regular by another culture.

In addendum, the Harvard Dictionary of Music (p. 678) describes pitch as the location of a musical sound in the tonal scale, proceeding from low to high. Pitch depends on the rate of vibration or frequency of sound waves that produce a particular tone. Two tones sound different because they have different pitches and the distance between each pair of tones is the interval of the half-step (semitone) the smallest interval used in most music in western society. These twelve pitches and their upper and lower octave duplicates constitute the total pitch resources out of which composers select their materials and fashion them into melody and harmony.

Commenting on tones, pitch and scale, Vidal (2009:5-6) states that these elements of music are as diverse as the over one thousand ethnic groups found on the African continent. The ambit of musical tone in traditional African music is generally wider in corpus than that encountered in Western music culture and it also vary from one ethnic or geographical area to another. Musical tones are conceived on bells, slit gongs, upright drums, hourglass drums and toned drums. An examination of double bells in Ewe music tradition shows that the gankogui (bells) of the Ewe are tuned in fourths and fifths in contrast to those of the Yoruba Agogo (bells) which are tuned in thirds. The twin Atumpo drums of the Achanti are tuned in fifths and fourths. The other drums that constitute each ensemble are similarly tuned. It is not sufficient to play the various parts of each drum correctly; the ensemble must also sound correctly. In other words, there is a particular sound system on which each repertoire is conceived. Although there is training in terms of Intervals, there is no standard pitch across Africa to which musical instruments are

tuned. This accounts for diversity in musical sounds even of the same repertoire as one move from one geographic area or location to another.

Enunciating Vidal's postulation, Agu (1999:34) expounds the vocal aspect of sound in relation to African perception of pitch structure.

The pitching of African songs mostly depends on the tuning of each singer or performing group... [Pitch levels and tonal ranges of Africans differ according to areas and locations. For example, there are areas noted for singing in sonorous high pitch voices. And there are areas where the standard of voice qualities is the opposite.

Furthermore, Agu points out that it is important to mention that no African traditional folksong has a fixed pitch since they are not scored. Each group largely depends on its soloist, who always pitches all their songs correctly. He added that there are of course occasional shifts, but most soloists never move far away from their constant tones with regard to songs based on the same scale and melodic frame work.

In consonance with Vidal (2009) and Agu (1999) on African perception of pitch structure, Akpabot (1998) states that pitch in African music is not regulated. He substantiated this statement by using the example below Figures 1-10.

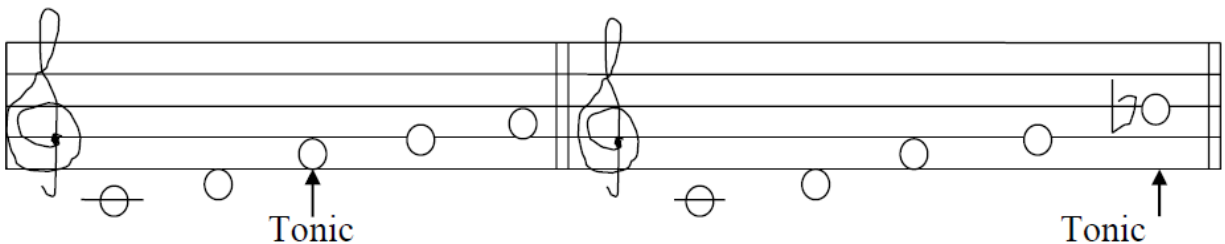


Figure 1: Pitch concept.

Taking the first note C as the tonic of these two scales we find that none of them conforms to the common Western pentatonic scale. This is because in an African Scale, pentatonic can occur anywhere on the scale as a 'movable doh' and not necessarily on the first note as in Western music. The African musician hears tones and not semitones which accounts for why village choirs trying to sing Western hymn tunes find it difficult to sing semitones in the scale whether raised or lowered.

SCALE CONCEPT: WESTERN AND AFRICAN PERCEPTIVE

Each musical culture has one or more sets of tuning that define the gaps or intervals between pitches in that groups music. By the 18th century most western music was based on 12 equivalent intervals per octave. This system is represented by the chromatic scale. Its 12 (called half-steps or semitones) can be heard by playing the tones to correspond to 12 (twelve) adjacent frets on a guitar fret board or to 12 (twelve) adjacent keys on any modern western keyboard instrument. Also for the past centuries, the preferred underlying pitch structure in western music has been the diatonic scale. This scale consists of seven tones related by a total of five whole-steps and two half-steps arranged in the sequence from C – C of the white keys of a modern piano or organ. Depending also on the pitch relationships among whole-steps and half-steps, scale systems are referred to either as major or minor or as a specific kind of ecclesiastical or church mode.

Onwekwe (2005) quoted Randel (2001:22) that the diatonic scale is a scale with seven different pitches (heptatonic) that are adjacent to one another on the circle of fifths, thus, one in which each letter name represents only a single pitch and which is made up of whole tones and semitones arranged in the pattern embodied in the white keys of the piano.

In all music of the world certain tones assume greater importance than others. In western music the first tone of the scale 'doh' also called the tonic or keynote serves as a home base around which the others revolve and to which they ultimately gravitate. The particular scale chosen as the basis of a piece determines the identity of the tonic and the tonality. Below are illustrations of

(i) Major scale (ii) Minor scale and (iii) Chromatic scale.

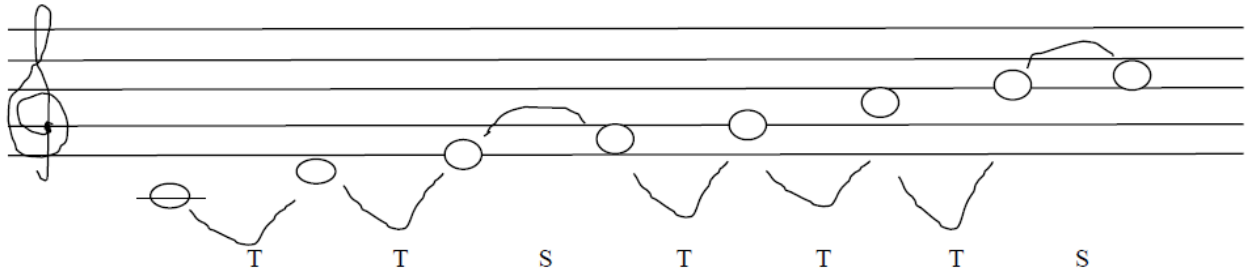


Figure 2: C major.

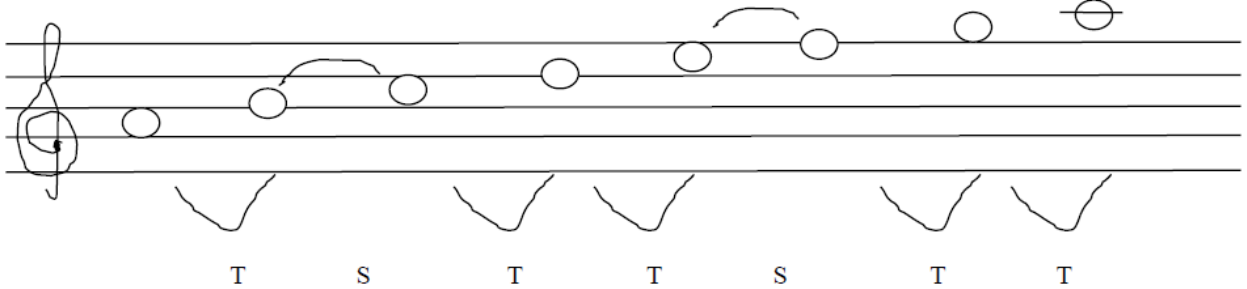


Figure 3: A minor (Natural).

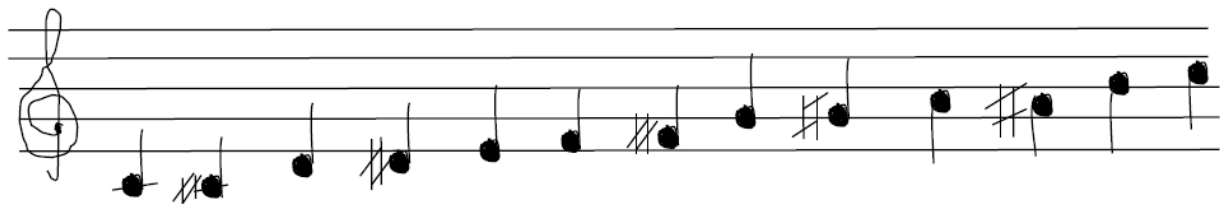


Figure 4: Chromatic scale built on C.

The illustrations (i, ii, and iii above) shows the difference evident in the pitch structure through the various scale pattern of western musical culture.

Akpabot (1998:26) outlined six scale structures or patterns used in African music as follows;

- diatonic
- tritonic
- tetratonic
- Pentatonic
- hexatonic
- heptatonic

Examples are illustrated below;

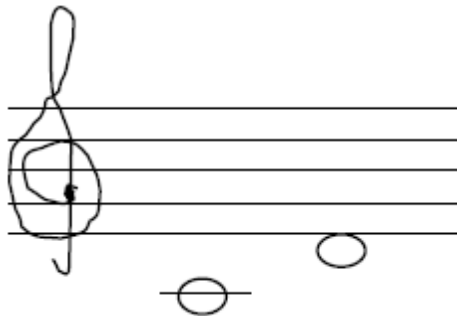


Figure 5: Diatonic.

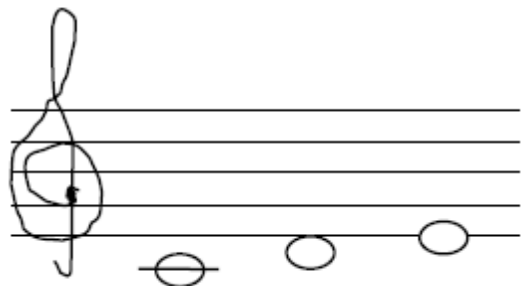


Figure 6: Tritonic.

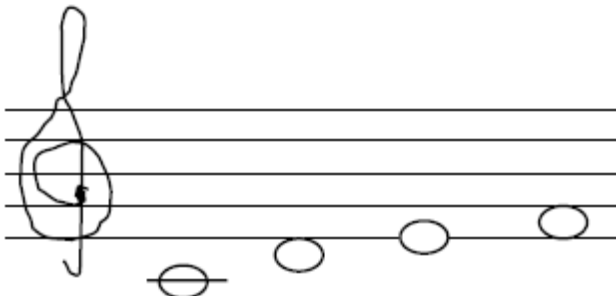


Figure 7: Tetratonic.

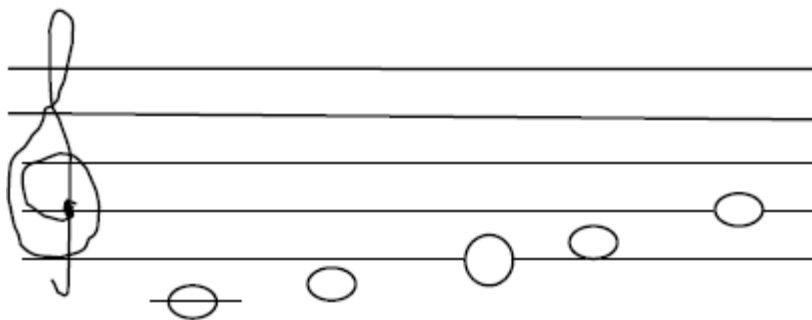


Figure 8: Pentatonic.

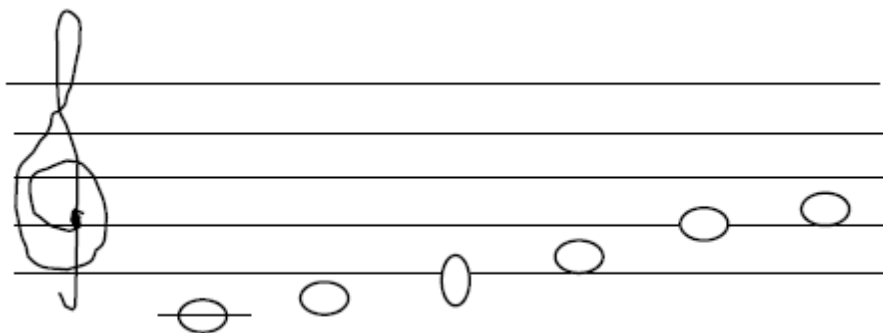


Figure 9: Hexatonic.

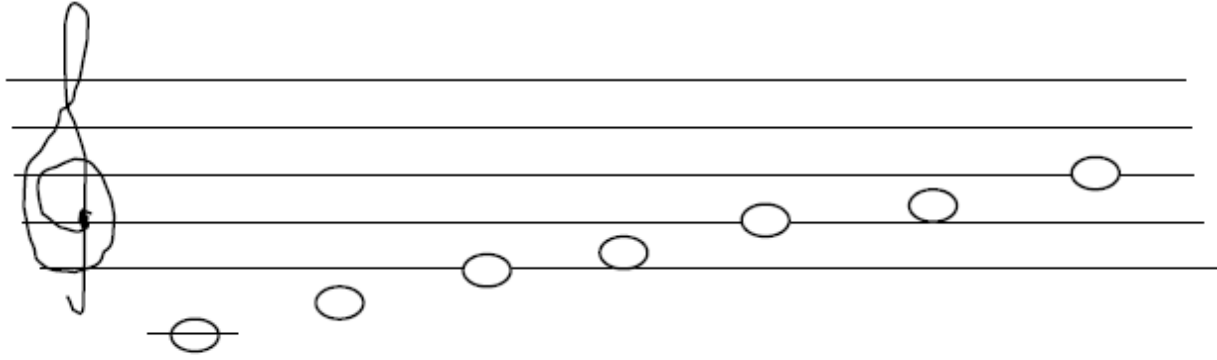


Figure 10: Heptatonic.

Agu (1999:33-34) comments that from the evidence of extensive recordings of African songs, it is observed that the major scale systems in use are diatonic in conception and consist of intervals of full and half notes. The greater number of melodies use between three to seven tones.... [Which ever modes are used, certain uniformity does occur in different African regions. In some places a five-note scale is in use while in others a six-note scale prevails. Within these different scale types, many variations exist.

Many music traditions do not use scales. The most familiar of these to the western listener are medieval chant and the classical music of India that recognizes twenty-two different pitches within an octave, each raga uses five, six or seven of these possible pitches. In these and other musical traditions or cultures, the rules for constructing a piece of music are quite different than the rules for music that is based on scale.

CONCLUSION

The discuss reveals that pitch (related to both vocal and instrumental) is not regulated in African music due to the diversity in ethnicity and location and sound matrix of individual musical culture as juxtapose to the western musical culture which already has an established pitch standard generally accepted among western culture and globally.

The complexity or simplicity in pitch structure (vocal or instrumental) can be located through the arrangement and assembling of effects created by the various intervals, chord and triads. Although there are many fundamental differences between western, African and other world music traditions, certain similarities appears to be a common heritage of all humanity. Yet the resulting sounds are often so diverse as a result of their pitch structure that the music of a group may not be recognized as music at all by other groups.

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