

# **Investigating Study of the Tone of the Voice and the Tone in Tonal Languages**

**دراسة استقصائية لنبرة الصوت والنغم في اللغات النغمية**

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Tone.**





## Abstract

This research deals with the tone of the voice and how it is created and how the human beings can produce their voice for specific intentions, the tone of the voice has a major part in communication and how the tone gives linguistic knowledge, the tone of the voice allows persons to differentiate between the spoken structures, and it can also uncover the character of the speaker. The tone of the voice can also be defined as the prosody combined with the attitude, and it contains the paralinguistic features of the spoken communication and conveys the speaker's behaviour.

The research also sheds light on the tonal languages as common languages in the world, and what are the significant tones in some of tonal languages, and how the lexical tone in tonal languages is regular and common more than grammatical structures which refer to the meaning. The tonal languages use the pitch variations with the syllables to mark the variation in meaning and the pitch is a major element in these types of languages, the tone of the voice in the tonal languages is recognized as the movement of the pitch which is implied by a tonal language to indicate to the lexical or grammatical meaning.

## المخلص

يتناول هذا البحث نبرة الصوت وكيفية تشكيلها، وآلية إنتاج البشر لأصواتهم للتعبير عن مقاصد محددة. وتؤدي نبرة الصوت دوراً رئيساً في عملية التواصل وكيفية تقديمها للمعرفة اللغوية؛ إذ تتيح للأفراد التمييز بين البنى الكلامية المختلفة، كما يمكنها الكشف عن سمات شخصية المتحدث. علاوة على ذلك، يمكن تعريف نبرة الصوت بأنها العروض (الخصائص النغمية) مقترناً بالموقف السلوكي، وهي تشمل على الميزات المحاذية للغة (العناصر الصوتية غير اللفظية) في التواصل الشفهي، كما تعكس سلوك المتحدث.

كما يسلط البحث الضوء على اللغات النغمية بوصفها لغات شائعة في العالم، ويستعرض النغمات الجوهرية في بعض هذه اللغات، موضحاً كيف أن النغم المعجمي في اللغات النغمية يعد أكثر انتظاماً وشيوعاً من البنى النحوية التي تشير إلى المعنى. وتستخدم اللغات النغمية تنوعات طبقة الصوت (التردد الصوتي) مع المقاطع اللفظية للدلالة على التغير في المعنى، وتعد طبقة الصوت عنصراً رئيساً في هذا النوع من اللغات. وتُعرّف نبرة الصوت في اللغات النغمية بأنها حركة طبقة الصوت المستغلة في اللغة النغمية للإشارة إلى المعنى المعجمي أو النحوي.



## 1. Introduction

In linguistics, the difference in the pitch of the voice and speaking is recognized as (Tone). Former phoneticians and phonologists do not mention a clear relationship between the phonetic and phonological parts of the tone of the voice. At the beginning of the 20<sup>th</sup> century, there is limited phonological characteristics and an immediate tradition of a new evolution and segmental phonology. Researchers and linguists recall the relationship between the concepts of "phoneme" and "allophone" and sometimes these idioms make challenges. Many scholars and linguists mentioned the idiom "toneme", and one of linguists is Beach who rejects the tone of the voice to the similar placement of phone, because phone is an idiom used in a phonetic shape completely more than in the phonological shape.

According to Pike (1948: 4) the tone of the voice does not contain common agreement, because the tone of the voice owns intensive non-theoretical application and the sense of the pitch unit, i.e., the toneme.

Trask (1996:356) indicates that the tone of the voice takes place in different languages, and the words of various languages have non-identical meanings which contain similar successions of consonants and vowels are treated simply by the differences of the pitch.

Kennedy (2017: 387) mentions that the tone of the voice is a phonological aspect, and many languages employ tone in contrast to the pitch, the tone and the pitch indicate to the regularity in the human beings' voices, pitch points out to the total amount of frequency of the vocal fold's movements, but tone points out to the humans' higher and lower frequencies.

The expression (The Tone of the Voice) covers various acoustic properties of the speech that notify a person's emotional condition, attitude and intentions with the clear semantic meaning of the words, paralinguistic characteristics show the non-verbal factors of communication confirmed by speech, i.e., intonation, pauses and speech tempo, which adjust the meaning of the verbal expressions. Extra-linguistic characteristics are relevant to broader contextual factors, i.e., speech rate and voice quality, providing extra layers of information on the speaker's behaviour and background. (Xie et.al., 2024: 8).

## 2. The Components of the Tone of the Voice

The tone of the voice contains limited combinations of components identified independently in isolation from language usage; each component of the tone of the voice can be different independently to influence the message explanation. These components, i.e., pitch, timbre,



rate and volume are acoustically commensurable and perceptually different. (Bhattacharjee and Manna, 2016: 23).

The single component interacts in complicated cases, and one component affects the perception of the other components. For instance, the message may be conveyed by the words pronounced and the tone referring to the speaker's behaviour toward the message can be conveyed by a typical aspect of a voice quality. (Busà 2023:25).

Pitch refers to the frequency of the speech sound, and commonly measured by Hertz or with the fundamental frequency (Fo) in the musical notation. The timbre refers to the voice quality which is relevant to the colour or acoustic, i.e., fullness and resonance. Rate refers to the speed of delivery measured in syllable or words, and volume refers to the loudness of an articulation and it is mentioned as a variance in decibels.

In many cultures, the tone of the voice involves a group of components which can be manipulated to signify the paralinguistic characteristics and to show a speaker's emotions, the tone of the voice acts as a supplementary source of information with the language itself.

### **3. The Exemplification of the Tone of the Voice**

According to Goldsmith (1976), the division of the speech into phonemes can continue in various approaches in several languages, the criteria of the place and manner of articulation are generally used as segmental characteristics being a part of independent consonants. In this sense, many languages of the world have these criteria, and these criteria can lengthen with various phonemes, i.e., nasalization as generally a distinguishing occurrence of the nasal consonants, but in various languages, nasalization can be regarded as a characteristic of a syllable or a part of a word. The movement of the vocal folds which modify the pitch of a sound may be a characteristic of one phoneme, a characteristic of a syllable and a characteristic of a word.

The main assertion of the modern supposition of amplification of the tone begun by Goldsmith, Goldsmith refers to the articulatory criteria such as: Aspiration, nasalization, voicing and tone of the voice which can be regarded as autonomous criteria, and the vocalizations which outcome from these vocalizations is primarily dependent. One of the fundamental functions of the phonological supposition is to organize languages specifically in addition to the general concepts which adjust the relations between the autonomous criteria, Goldsmith and other linguists identify this exemplification as (Auto-segmental phonology). Auto-segmental phonology is suggested and purposeful to mention the reality that the possible independence of the different types of phonological criteria is considered as influential and significant. (Katamba, 1989: 190).

### **4. The Value of the Tone of the Voice**



Recognizing the tone within a repeatable structure makes a formal base with which language learners can convey and assess relevant tonal elements and confirm substantial communicative feedback patterns.

The pitch is not the only phonological characteristics, it is a phonetic characteristic with a difference of prosodic purposes and it can be classified phonologically with regard to the various purposes. The purposes are commonly specified to one of three kinds:

- 1- Tone
- 2- accent
- 3- intonation

Tone contains lexical or grammatical importance as a fundamental characteristic of a morpheme, a word or a grammatical structure. (Fox: 2000: 179).

Callier's (2010) investigation mentions that the tone of the voice had its most important paradigm change during the 20<sup>th</sup> century, changing from physical property of sound relevant to tools to a socially and culturally notified feature of personal idioms. The combination of physical features with sociolinguistic context structured tone of the voice as a multi-layered and complicated tool of the human being's interchange, providing the linguistic idea of communicative competence to control the level of reading, increasing the expressive qualities of the speech with dramatic differentiation and clarification. These sophisticated factors produce indications that the tone of the voice is complicated, and it is also socially informed and valuable with ever-present observation and taking into account.

The tone of the voice covers any vocal activity based on communication which needs information, i.e., emotions, personality and engagement level. The voice turns into a critical medium used with speaking and reading in daily communication. The combination of prosodic components used by speakers, i.e., pitch variation, loudness and tempo form the identifiable tone of the voice which conveys affective, epistemic and lyrical meanings, the tone of the voice attributes the influence of the hearer's perception and the significance of the message conveyed. (Fisher et.al, 2018: 2-4).

According to Skandera and Burleigh (2022: 20) the tone of the voice is also categorized as the voice quality, tonal quality and Timbre, the tone of the voice indicates to the variation in two persons' voice in vocalization one sound and similar phonetic characteristics, this can be contrasted with the variation of two musical instruments. Various tones are created by various kinds of oscillation of the vocal folds. The vocal folds make several series of the sound oscillations which are not similar in the sound nature.



The tone of the voice is similar to the pitch and loudness, and it is a characteristic in any pronounced language. Many phoneticians and phonologists referred to the tone of the voice is classified as a paralinguistic characteristic, the tone of the human being helps people to differentiate between the voices of males and females, and we can distinguish the condition of the speaker, i.e., happy or sad, furious or tired, and so on.

## 5. Types of the Tone of the Voice

According to Doke's (1931) classification of tones, there are two types of the tone of the voice:

### A- Characteristic Tone

This type indicates to the strange pitch characteristic and a particular language, Doke regards such characteristics as unnecessary in the grammatical indication in a language, in contrast to necessary tone. This seems to coincide with the relation between the phonetic and phonological characteristics of tone. Hence, it is unobvious the pitch criteria which are characteristics of one language are certainly non-phonological.

### B- Significant Tone

Doke classifies this type into three groups:

#### 1- Semantic Tone

This group indicates to the lexical function of the tone of the voice. It shows the strength to identify non-identical words.

#### 2- Grammatical Tone

This group deals with morphological function, for instance, for classifying dissimilar structures in the identical paradigm.

#### 3- Emotional Tone

This type of tone focused on the unique pitch characteristics, i.e., irony, astonishment, amazement and humour. (Fox, 2000: 186).

## 6. Tone and Linguistic, Paralinguistic and Extra-linguistic Attitudes

The human voice is a complicated acoustic signal and it notifies the explicit linguistic meaning, resources information regarding the speaker's subjective conditions, social situations and communicative purposes. This complicated interplay of the vocal factors consisting of pitch, loudness, duration and voice quality enables the immediate transmission of both linguistic and non-linguistic messages. The speech effectiveness forms the emotional and cognitive replies with intonation, the vocal tone and emphasis; these vocalic characteristics participate considerably in the overall explanation of the spoken message, sometimes reporting the attitudes and emotions which extend to the semantic meaning.



Extra-linguistic attitude refers to the residue in speaking indications when the investigation of the whole coded linguistically and paralinguistically parts are done. Extra-linguistic speaking parts are generally prosperous with factual information about the speaker and habitual knowledge, i.e., the speaker's voice type. In this sense, extra-linguistic attitude is an informative attitude, not a communicative one. (Laver, 1994: 21-23).

Thinking of the extra-linguistic characteristics of the voice, i.e., speaking rate, pitch variability and vocal tension present opinions to the understanding emotional and cognitive conditions of the speakers, which commonly surpass explicit linguistic meaning, these paralinguistic characteristics supply a copious origin of information of the emotion cognitive systems, and they are less susceptible to intentional manipulation than the linguistic meaning and can detect perfect emotional differences. (Singh, 2024: 2193).

Furthermore, the discussion of the combination of the extra-linguistic keys with linguistic and paralinguistic information can improve more comprehensive and correct examples of human dynamic conditions, particularly in cross-cultural and multilingual contexts where immediate linguistic explanation of emotion might be incomplete. (Dixit et.al., 2024: 4).

The paralinguistic characteristics, i.e., prosody and voice quality are fundamental factors in conveying attitudes and emotions, and extra-linguistic characteristics indicate broader contextual information, this refers to how the linguistic, paralinguistic and extra-linguistic characteristics participate with the attitudinal and emotional changes in speech, this relationship is definitive in developing complicated examples which may exactly explain and synthesis speech, these elements collectively compose the perceived meaning and the purpose of the spoken structures. (Wang et.al., 2025: 1).

Linguistic knowledge is commonly used in everyday activities, and the widespread usage of the linguistic attitude is the communicative attitude, the communicative attitude focuses on the dual-level code of speaking and it is composed of the grammatical and phonological structures.

The paralinguistic attitude is a communicative attitude and it is regarded as non-linguistic and non-verbal, the paralinguistic attitude is intended to fulfill the purposes in speaking, such purposes as the speakers' conditions, i.e., sorrow, commotion, frustration, joy, .... etc. The paralinguistic attitude encompasses interaction by the tone of the voice, and the paralinguistic attitude is like the linguistic attitude when



the paralinguistic indications constitute a coded kind of interaction when its meaning is not inevitably clear to the listener with global foundation, it is specified to the environment of the speaker.

#### 7. The Acoustic and Paralinguistic Elements of the Tone of the Voice

There are many observed investigations which have classified some acoustic elements of the tone of the voice, characterizing its elements signals and discovering their respective social and cognitive results. Among these elements, various acoustic aspects of speech, for instance, prosody, tempo, pitch, loudness and intonation stay basic areas of inquiry.

In the linguistic studies, prosody is the study of aspects of speech which are not phonetic segments, but they are aspects of syllables or the major aspects of speech. According to Trask (1996: 295) prosody is a phonological component which is recognized phonetically with one or more than one phoneme, consisting of lip-rounding, backness and nasalization, Trask adds that prosody can be classified to indicate to an area longer than one phoneme.

Certain prosodic features shape intensive dynamic keys enhancing and analysing the conveyed textual message. The acoustic elements of the tone of the voice create reactions of the listener. The listener understands the speaker's purpose. Therefore, the speaker's description, competence evaluation and social attribution occur in common speaking structures. (Ayuningsih, 2019: 2).

#### A- Pitch, Intonation and Rhythm

Prosody has a linguistic significance and prosody can convey the speaker's behaviour or passion according to the prosodic signals which occur in the speech. Prosody refers to how the words and sentences are distinguished and how the pitch, loudness and length cooperate to create the rhythm and intonation. (Ball and Rahilly, 2013: 105 and Cruttenden, 2014: 4).

The pitch refers to the high or low voice, and intonation refers to the global rise and fall of the pitch in an utterance, and rhythm describes the patterned arrangement of a sound over time. Any spoken language contains a basic rhythmic structure consisting of regular pulses which accompany syllables and intervals between syllables and phonemes. (Busà, 2023: 25).

#### B- Loudness, Tempo and Prosody

Loudness refers to the intensity or the volume of a sound, and loudness is regarded as a significant acoustic dimension of the tone of the voice. In speaking, loudness conveys the indications of excitement, urgency, anger and melodramatic purpose. Tempo assigns the rate of

speed before pauses, and it affects how fast a message is understood. (ibid).

### C- Timbre and Voice Quality

The spectral characteristics of the voice, the timbre, formants and voice quality indicators enable listeners to compose impressions of communicators. Voice quality contains a group of characteristics that distinguish speakers with the same phonetic structure. Voice quality appears with the speaker's unique combination of the vocal tract resonance, glottal vibration and laryngeal modification.

Specific parameters, i.e., breathiness, nasality and vibration sharpen the available categorization, and particular dimensions of voice quality reliability signal the effective states, engage linguistic processes and influence judgements. Timbre also contains sound characteristics, i.e., aspiration, creak voice and glottalization, these characteristics can regulate the emotional interpretation. The grammatical and contextual variation in voice quality between the speakers influence the linguistic message. (Tiwari and Tiwari, 2012: 7).

## 8. Tonal Languages

Tone has an extremely broad range of meanings, the significance of tone in phonetics and phonology is very limited. Tone indicates to a recognizable factor of pitch which is applied in the linguistic diversity. There are many languages classified as (Tone Languages), the linguistic assignment of the tone is to modify the meaning of the word, i.e., in the Mandarin Chinese language, when the word /ma/ is pronounced with a high pitch, it means (mother), and when it is pronounced with low-rising tone /ma/ it means (hemp). The tone of the voice in many tone languages shapes the major aspects of intonation, the rising or the falling tone in a specific word can convey distinct understanding of the sentence. (Roach, 2002: 80).

Various languages contain pitch variation, and pitch variation is applied to differentiate the meaning between words, for instance, the English language uses voicing to differentiate between:

tune /tju:n/      dune /dju:n/  
fan /fæn/      van /væn/

The difference of sound also can be applied in the place of articulation, as in:

do /du:/  
zoo /zu:/

In other languages, i.e., the Nupe Nigerian language, the pronunciation of [ba] can mean the following meanings according to the tone of the voice:



- 1- When the tone is high, [ba] means (to be sour).
- 2- When the tone is low, [ba] means (to count).
- 3- When the tone is between high and low, [ba] means (to cut).

The tones in the Mandarin Chinese language are generally contoured tones, and contoured tones commonly need a rise or fall of the pitch with the duration of the syllable, contoured tones may be analyzed into fundamental parts of high and low tonal values. (Kennedy, 2017: 388).

Within the tone languages, the syllable signifies a single lexical expression, and the modification of the pitch coincides with varied lexical expression. The Mandarin Chinese language is commonly known as an excellent model for clarifying the tonal differences, as in following:

| Segmental Form | Tone               | Meaning |
|----------------|--------------------|---------|
| ma             | High tone          | Mother  |
| ma             | High-rising tone   | Hemp    |
| ma             | Low/fall/rise Tone | Horse   |
| ma             | High-falling Tone  | Scold   |

#### **Adapted from (Kennedy, 2017: 388)**

Tone language depends on the pitch variation, and these languages is classified as (Tone Languages) (Davenport and Hannahs, 2020:89).

Tone refers to the diversity in the pitch in pronunciation, and tone discerns between word structures and parts of speech. In tone languages, the tone of the voice is an aspect of the words, and the free tone of the voice is not significant, the relative tone is the significant one. The tone languages commonly create an application of a finite number of tone similarities, these similarities are recognized as the tones of specific language, and the specific area of the tone is the syllable structure.

The tonal languages present various phonological processes which refer to the relations between tone and other units, i.e., segmental and prosodic structures, these processes commonly carry the form of synchronically neutralized phonemes and they are affected by the position of the tone in the sequence and in its morphological condition. The tone structures also take the fundamental diachronic modifications which modulate the eradicate kept tones, these modifications detect the phonological characteristics of tones and different tone languages show significant multilingualism in formal, informal, transient and last relations with neighbouring languages and language itself.

### **9. Types of the Tone in the Tonal Languages**

#### **A- Level Tones (Monomoraic)**



**Remijsen (2013: 322)** mentions that monomoraic syllables contains a single vowel nucleus without an accompanying coda (e.g., CV), which are generally constrained to a single tone assignment. The monomoraic tone systems often grapple with the tension between phonological abstractness and phonetic reality, particularly concerning the underlying representation of tonal contours and their surface manifestations.

Level tone refers to the phenomenon when a single mora serves as the exclusive bearer of a phonological tone, a characteristic that differentiates certain tonal languages from those where tone spans across multiple moras or syllables. This structural specificity is crucial for understanding the tonal inventory and realization patterns in languages where moras function as tone-bearing units, particularly in contrast to polysyllabic or poly-moraic tone systems.

The monomoraic syllable is typically limited to carrying a single tone, while heavy bimoraic syllables possess the capacity to bear two separate tones. (Alderete, 2001: 239 and Vydrina, 2017: 367).

Moreover, the interaction between tone and morphological levels in languages illustrates that tonal alternations are often conditioned by specific morphological and lexical triggers, complicating a purely phonological account. This complexity often necessitates a refined understanding of how tone targets align with the edges of moras, particularly in systems where contrastive alignment is crucial for differentiating tonal patterns. For instance, some phonological processes, such as hiatus resolution and reduplication, provide evidence for a monomoraic representation in languages like the Bemba language. (Hamann & Kula, 2021: 6).

### **B- Registered-tone (Multimoraic)**

This kind of the tone contains regular conditions of tones, the tones vary according to the high or low tones, registered-tone language is an advantage of numerous languages in Western African languages.

The investigation of registered-tone describes how pitch contrasts function alongside phonatory and temporal characteristics to create lexical relations beyond simple contour melodies. The conventional tonal analysis concentrates primarily on the fundamental frequency (Fo), the registered tone systems incorporate multidimensional acoustic keys, i.e., breathiness, voice quality and intensity to maintain lexical contrasts. This multidimensionality proposes that register tone performs as a distinct phonological tier, where tonal characteristics are recognized as relative to



the actual register setting rather than as unlimited pitch targets. (Khan et.al., 2020: 102923).

Registered-tone generally highlights the participation of laryngeal articulations in prosodic phenomena, including register tone, and the interaction between breathy voicing and lower tonal registers. The co-occurrence of lower basic frequency and breathy phonation in what are often termed 'low register' environments is a recurring pattern in languages with phonological register distinctions. This intense relation suggests a possible diachronic relatedness, where voice quality variations might have influenced or become integrated into the tonal system itself, contributing to the development of register systems.

This accurate relationship between laryngeal characteristics, such as laryngeal height and vocal-fold stiffness, and tonal distinctions is further sophisticated by cross-linguistic variations, specifically in the Semitic languages, where articulatory gestures underlying tonal contrasts still a topic of ongoing research. (Chen and Kenstowicz, 2024: 54).

Different studies have researched the acoustic characteristics distinguishing various phonation types in tonal languages. The phonetic variations in phonation are not merely occasional but are systematically employed to recognize tonal categories in many Southeast Asian tonal languages, such as the Vietnamese and Burmese.

### **C- Contour Tone.**

Newman (1986: 181) emphasize that the contour tones are recognized as unitary phonemic primes where the field of the toneme encompasses the entire lexical structure rather than individual phonemes.

Furthermore, languages such as the Mandarin Chinese posits that contour tones are phonologically unitary entities rather than derived from a sequence of level tones (Boersma, 2009).

The phonetic classification of the contour tones is regularly limited by the psychological limitations in speech production which can affect their distribution in the phonological system. (Remijsen, 2013: 300).

The tonal languages use pitch activities across the duration of a syllable to produce meaningful lexical relationship. The lexical relationships are broadly recognized with level tones, which keep a regular harmonious frequency, and contour tones are defined by a distinguished change in pitch high with one syllabic segment. The lexical tones may need constant fundamental frequency targets, the contour tones explicitly encode pitch activities, for instance, rises or falls as essential phonemic elements. (Toh et.al., 2022:1).

The complicated relationship between intonational contours and lexical tones clarifies how pitch variation can serve distinct linguistic functions from highlighting discourse structure to differentiate the lexical meaning. (Tjuka et.al., 2024: 2).



The phonological phenomenon of the contour tones which mention an important pitch change with a single syllable has long been a compelling area of inquiry in linguistics research.

## 10. Conclusions

Communication is multidimensional, and the content is often given priority over voice, tone and bodily gestures, which have far-reaching effects on the interpretation of that content. The tone of the voice is a complicated structure with different definitions and frameworks. In this sense, the tone of voice is defined as the emotional and attitudinal information communicated beyond the literal content of a message, observable during its delivery.

The tone of the voice can be further partitioned into three interrelated aspects: prosody, which includes pitch and tempo; sound, which includes articulation and quality; and pragmatics, which conveys information about the communicative situation and relationship between message participants.

The tone of the voice contains the tonal features of verbal messages and their communicative effects, tone captures variation in prosody (e.g., pitch, intensity, duration and speech rate) and paraverbal delivery, i.e., articulation, fluency and disfluency.

The tone of voice has a multifaceted role in social interaction and allows the speakers to express themselves and the listener to interpret speaker's purpose, and it can be conveyed in different ways between modalities. The spoken form of tone is primarily constituted by auditory signals.

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