

University of Al-Qadisiyah

College of Education

Department of English

PITCH VARIATION

By:

Rusul Saleh

&

Rana Jameel

Supervised by:

Assist. Lec. Kareem Ashoush Mahdi

2018

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

{لَقَدْ خَلَقْنَا الْإِنْسَانَ فِي أَحْسَنِ تَقْوِيمٍ}
صدق الله العظيم

سورة التين
آية (٤)

Acknowledgement

We would like to express our special thanks of gratitude to
our supervisor:

(Assist. Lec. Kareem Ashoush Mahdi)

who generously helped us in doing a lot of research and
we came to know about so many new things we are truly
thankful for. For everything, bless you.

Tables of Contents

Subject	Page No.
Acknowledgement	II
Contents	III
Abstract	IV
1.1 Introduction	1

Chapter One

1.2 Pitch range	3
1.3 Function of Pitch Range	3
1.4 Intonation in text and discourse: language	3
1.4.1 Attitudinal function of pitch variation	
1.4.2 Functions of pitch range in statements	
1.4.3 Grammatical function of pitch range	
1.4.4 Accentual function of pitch range	
1.4.5 Discourse function of pitch range	

Chapter Two

2.1 Acoustic measurements of pitch variation	11
2.2 Amplitude	
2.3 Signal- to- noise ratio	
2.4 Raise and fall time	
2.5 voice tremor	
2.6 phonation time	
2.7 voice stoppage	
2.8 Frequency breaks	
3- Conclusion	12
References	13

Abstract

This research aims to clarify the power of pitch; the variation and its functions. This thesis is a guide-like, it teaches you how to control your voice, change your tone, and use **pitch variation** for better stress and intonation.

The research is divided into two chapters: In chapter one, the researcher reviews the functions and the four types of attitudinal intonation.

In chapter two, the research sheds light on the acoustic measurement of pitch variation. At the end, the researcher gives a conclusion of what has been analyzed in the earlier chapters.

1-1 Introduction

In connected speech, spoken words may vary considerably from their forms in isolation. Much of the variation is regular. There have been heated debates on whether and how speakers store regular variants in their long-term memory, and how they process them in speech production and comprehension. Most psycholinguistic work, however, focuses on how listeners cope with segmental variation.

The current project instead proposes to examine how speakers store and process regular pitch variation. Our empirical focus is on Chinese dialects, where pitch changes (tones) are used to distinguish word meanings in isolation, but tonal realization of words in phrases is determined by domain formation and pitch changes within the domain, together known as tone sandhi. Crucially, both how a tonal domain is formed and how sandhi variants are realized within the domain are influenced by a complex mixture of pragmatic, syntactic, and phonological factors. The pitch variation in these dialects thus manifests at all levels of linguistic organization.

We hypothesize that the way pitch variation is stored in the mental lexicon and processed during speech production varies according to the types of tone sandhi changes and the constituent structures of sandhi domains. We will take an interdisciplinary approach to test this hypothesis. Cross-dialect speech corpora will be compiled to obtain a comprehensive understanding of how pitch variation is conditioned in linguistic contexts. Acoustic and perceptual experiments will be conducted to understand the categorical vs. gradient nature of pitch variation. Both voice onset latencies and speakers' eye movements during speech will be monitored to tap into the representation as well as the processing of pitch variation.

Chapter one

1-2 Pitch range

Is the adjustment of the vocal cords of the person. By loosening the vocal cords, a person can raise the pitch of his voice and when they are stretched, the pitch of his voice increases. Pitch range shows speaker's attitude towards information. It's divided into three levels: high, mid and low.

High pitch range indicates contrast of information.

Mid pitch range shows statement in natural manner.

Low pitch range shows that items in successive tones are equivalent.¹

1-3 Function of pitch range:

Pitch Change can do attitudinal, discoursal, accentual and grammatical function through referring to different features. First, the active modulation of speaker's voice or to that is caused by changing the frequency of glottal pulses. Second, the impression created in the hearer that is pitch. Third, the abstract system of tone or pitch which is contours or patterns that is used to structure and emphasizes bits of information to arrive such abstract, a listener attitude considerate at the pitch range of individual person each range in pitch relative to the range (which man .A ,2000).

1-4 Intonation in text and discourse: language

Falling pitch refers that speaker finished intended information at the end of statement. Pitch falls whereas pitch continues in low rising at the end of phrases before the end indicates or uncertainty, such as:

Ali got nervous, spoke loudly, broke the glass and injured his hand.

High degree of certainty or incompleteness in the meaning can be shown by the final high rise in pitch. Such as:

Nada wrote only two detective stories?

Since yes, no question indicates uncertainty and in completion, it tends in high rise pitch whereas it's answer in a high fall, such as:

Do you study hard ? Yes.

Since wh-question seeks unknown information to keep continuous interaction, it ends in high fall pitch, such as:

What did you do?

In tag question you know expression at the end of statement, Pitch Change depends on whereas the speaker means to ask or not. If he intends to state his belief, certainty correct information expecting listener's confirmation or the same meaning, Pitch falls at the end of tag question. Pitch rises if the speaker intends to ask.² Such as:

Maha is a clever student, isn't she

She loves him , you know

He hasn't come yet ,is he

It's the second on the left, you know

The same is true if the speaker uses grammatically 'Yes, no' question in the form of statement. Pitch falls at the end instead of rising, such as:

Doesn't he have a sense of humor?

1.4.1 Attitudinal function of pitch variation

Pitch variety enables the speaker to express emotions and attitudes that add special meaning to spoken language as a difference from its written counterpart.

It allows us to express finite, confidence, interest, surprise, doubt, joy , pain, irony, anger, boredom and so on. You may unintentionally give offence instead of gratitude if you don't know pitch variation well.

Four types of attitudinal intonation:

1-Rising intonation can express a number of variations emotions such as :non-finite, surprise, doubt, interest, politeness and lack of confidence.

It conveys an impression that something more is to follow, such as:

I phoned them. I have to leave now

-it's also used while listing things, such as:

Red, Brown, yellow, green and blue.

Orange, bananas, mangos and apples.

2-Falling pitch: refers that speaker finished intended information at the end of statement.

-question answered by yes, no and nothing more to be said as falling gives impression of finite.

-statement or declarative sentence:

We live in Moscow.

-wh.question:

Where do you live?

Command or imperative sentence:

Stand up!

Sit down!

-Exclamations sentence:

What a wonderful surprise!

3- **Fall-Rise pitch** shows limited agreement, response, reservation, uncertainty or doubt. Such as:

You may be right

You may be honest

It's possible

It can be true

4- Raise-fall pitch:

Strange feelings of approval-disapproval or surprise, such as:
He is Honest/ It's true.

1.4.2 Functions of pitch range in statements

Martha (1996:149) states that the pitch of the voice falls when the speaker has finished giving all of the intended information when an utterance is finished and wants to signal the end of a turn at speaking.

It seems likely that non-native speakers might tend to produce wh-questions may have rising or non-rising pitch, depending on whether they are really mental to ask questions or not :

Ali is really smart, isn't he ? Vs. Ali isn't back yet ,is he ?

In similar case, English speakers may use the expression you know to ask a question or not, as shown by the pitch:

It's the store on X street, you know? Vs. I like her , you know?

Even an utterance in the grammatical form of yes/no question can become a non-question, i.e. statement, if the pitch falls:

Isn't she lovely! Doesn't my baby speak well?

In these last two examples, the speaker does not ask a question but states a belief, expecting the hearer to have the same opinion.³

1.4.3 Grammatical function of pitch range

-Strong tendency for tone -unit boundaries to occur at boundaries between grammatical units of higher order than words.

-sentence, clause, phrase boundaries; e.g. restrictive V.s non-restrictive relatives clause (extra information; needs commas)

-A choice of tone between fall (statement) and rise (question) in many languages.⁴

1.4.4 Accentual function of pitch range

The word accentual is derived from "accent"; a word used by some writers to refer to what in this course is called "stress". When writers say that intonation has accentual function, they imply that the placement of stress is something that is determined by intonation refers that in the presentation. So far, it has been implied the placing of stress is independent of and prior to the choice of intonation.

Some older pronunciation hand books refer to this area as "sentence stress" which isn't an appropriate name: the sentence is a unit of grammar. While the location of tonic stress is a matter which interest the tonic- unit, a unit of phonology.⁵

For example:

- I, want to , know, where he's, traveling to. -Normal stress
(The word "to" being preposition and not a lexical word is not stressed).

-I want to know where he's traveling to (contrastive)
(I font want to know where he's traveling form)

- He was wearing a red dress (Normal stress)
- She was wearing a red dress (contrastive) she wasn't wearing a green dress.

Similarly, for the purpose of emphasis we may place the tonic stress in other positions in these examples:

A. It was very boring Non-emphatic

B. It was very boring Emphatic

1.4.5 Discourse function of pitch range

To focus the listener's attention on aspect of the message that is most important is placing of the tonic stress on that aspect such as using Falling-intonation to add new information, and Rising-intonation to show sheared information.⁶ For example:

| In Britain | for some reason or other | people drive on the left |

Chapter Two

2.1 Acoustic measurements of pitch variation:

Regarding vocal cords movement, acoustic measurement provides valuable information through measuring some acoustic signs such as - fundamental frequency (f_0) which is the vibratory rate of the vocal cords is measured in Hertz (Hz) or number of cycles per second. The phonation range is the range of frequencies (from high to low) that the speaker produces. The normalized standard deviation of fundamental frequency can be used to represent pitch variation. While the standard deviation will be higher if the speaker has raised or lowered fundamental frequency to give focus to an important word. Listener's ability can be effected to recall information if the speech that is delivered without pitch variation.

In tonal languages pitch functions to distinguish lexical rather than discourse meaning so speakers have difficulties from using pitch to structure discourse meaning.¹

The intensity and pressure are the physical measurements of the sound.

2.2 Amplitude

Amplitude means intensity, which correlates to perception of vocal loudness. It is measured in decibel (dB) which is known as the level of sound pressure that indicates the strength of vibration.

Roughness or hoariness correlates to perturbations is measured by rapid changes of period (f_0) (Jitter) and amplitude (shimmer).

2.3 Signal- to- noise ratio:

Normal voice has low level of noise, the periodic energy in the voice whereas abnormal voices have greater levels of noise.

2.4 Raise and fall time

Rise time is the time that vocal cords take to produce tone in fall amplitude whereas time vocal cords take to stop producing tone is fall time.

2.5 voice tremor:

Which is associated with nervous system dysfunction refers to a regular variation in (fo) and amplitude.

2.6 phonation time:

Can be measured by maximum phonation time that refers to maximum time a subject sustain alone on one breath and s/z ratio that refers to a speaker can sustain both voiceless /s/ and voiced /z/ for approximately equal duration in ratio of 1 and ratio greater than 1.4 may indicate vocal pathology.

2.7 voice stoppage:

During phonation, silence must be no longer than normal or else speech is abnormal.

2.8 Frequency breaks:

A sudden shifts of (fo) in upward or downward movements. ²

3- CONCLUSION

The voice is enriched to convey emotional state of the speaker during expressive speech and this emotional modulation affects pitch contour, one of the most important properties of speech. Accomplished analysis of pitch and pitch derivatives contours has shown that emotions surprise and anger have increased value of emotional features while decreased values of features were seen for sadness. Anger characteristics are delineated by higher mean pitch, high variance, fast rhythm, accenting syllables and falling contour of syllables. The happiness is characterized by high mean pitch, high variance, and rather fast rhythm, accenting few syllables with last word accenting and rising contour of syllables. The sadness emotion has low mean pitch, low variance, and slow rhythm with very few syllables accenting and falling contours of syllables. The neutral expressions are characterized by lower mean pitch than happiness with slow rhythm and very few syllables are accenting and rising contour of syllables. Surprise expressions are characterized by highest mean pitch with high variance, accenting syllables and falling pitch contours. The study reveals significant differences in variability between male and female speakers. The analysis showed that gross pitch contour statistics such as mean, standard deviation and range are more emotionally prominent in female speech expressions than male speech expressions. Average mean value of pitch contour is lower for male speaker but the deviation from average mean value of pitch contour for male and female speaker is similar among the emotions. Emotions surprise, anger and happiness have higher mean values than sadness and neutral with slow speaking style and variation pattern of both genders have similar behavior among the features at different activation levels. The analysis showed that although a significant difference in pitch parameters is noticeable between male and female speakers, the deviation from average value of pitch parameters for the speakers follow unvarying pattern.

References

BRAZIL, M. COULTHARD & C. JOHNS. Discourse Intonation and Language (1980).

Colton, R. H and Casper, T. K., Understanding Voice Problems: A Physiological Perspective for Diagnosis and Treatment, 2nd ed (1996).

Roach, P. English phonetics and phonology, p, 2000.

<https://owlcation.com/humanities/Pitch-Definition-And-Examples-Of-Pitch-In-English-Pronunciation>. Accessed 20 Mar. 2018

<https://quizlet.com/174275960/the-functions-of-intonation-flash-cards/>
Accessed 24 Mar. 2018

www.quora.com . Accessed 1 Apr. 2018