

# The importance of pitch in conveying meaning in English

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**Abstract.** Pitch, as a basic property of sounds and an important suprasegmental feature of speech, exerts its effect on many linguistic aspects at different levels. The current study mainly focuses on its pragmatic meaning realized by phonetic forms, namely the accent placement and tune. By observing the pitch curves of various renderings of utterances from the phonetic tool Praat and analyzing these typical instances, it is concluded that pitch is of great importance to listeners' grasp of various contexts and meanings.

## 1 Introduction

Pitch, as a basic property of sounds and an important suprasegmental feature of speech, exerts its effect on many linguistic aspects at different levels.

In some cases, pitch could convey the lexical meanings of a language. According to Xu [9], in Mandarin, “the four tones have the values of High-Level (Tone 1, as in mā), Mid-Rising (Tone 2, as in má), Falling-Rising (Tone 3, as in mǎ), and High-Falling (Tone 4, as in mà),” and they can refer to different meanings of “mother”, “hemp”, “horse” and “scold” respectively in certain contexts. Thus, Mandarin belongs to the category of tonal language. As it varies among four tones, the meanings change accordingly. Pitch, for another thing, is related to the frequency of sounds [4]. As it refers to the degree of highness or lowness of a tone and “an indication of pitch enters into the lexical realization of at least some morphemes” [6] in tonal languages, it could reflect correlation with the meaning contrasts. As the tone of Mandarin varies, so does the corresponding pitch and meaning.

In English, the variations of pitch contour do not cause such extensive lexical contrasts, whereas its influence on pragmatic meanings has been verified by a variety of researchers. One example presented by Pierrehumbert and Hirschberg [5] shows that a series of phonological units including pitch accents convey some pragmatic meanings such as newness or salience. In other words, the pitch accent placement represents reconstruction of important information so as to make target information sending more accessible and effective.

Moreover, pitch is proved to be a crucial auditory cue to distinguish other pragmatic meanings like vocal attractiveness [10], emotion [2], etc. Nevertheless, the research related to pitch is investigated deficiently [8].

## 2 Discussion

### 2.1 On English Accent Placement

Pitch accent has been defined by numerous researchers. As stated by Pierrehumbert and Hirschberg [5], “Pitch accents mark the lexical item with which they are associated as prominent”. To differentiate it from stress accent, Beckman [7] notes that stress accent mainly makes use of representative criteria other than pitch, the one shown in pitch accent. Although loudness, length and other acoustic cues can also highlight prominent syllables, none of them is as significant as pitch movements for the perception of salience [1]. Thus, pitch accent is deemed as especially noticeable in prosodic prominence and discourse emphasis.

In respond to different contexts, people tend to produce the same utterance in relatively different ways, and thus generate varying pitch accents. The current research specially formed the sentence *Mary is good at running*. On the basis of it, three contexts were further created to elicit this sentence as a response. The basic sentence without intentional accent placement and three responses in these contexts were then read and recorded by a male native speaker from North Britain using the software Praat at a sampling frequency of 44.1 KHz in a soundproof environment, and he was required to pronounce the expectedly natural accents varying with different contexts. Three created contexts and their corresponding versions of response are presented in (1a-c) as follows, and the foremost accent read by the speaker in each rendering is indicted by capitalization:

(1) Mary is good at running.

a. What is Mary good at? — Mary is good at RUNning.

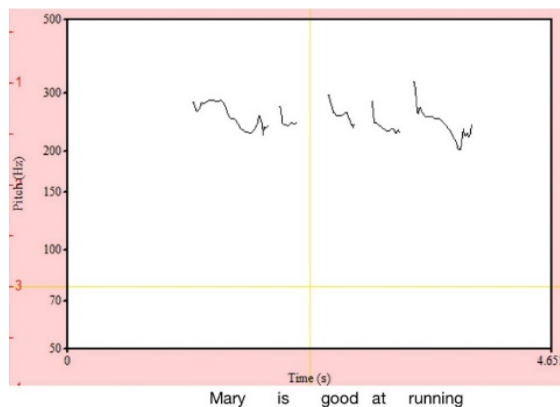
b. Who is good at running? — MARY is good at running.

c. Is Mary bad at running? — No, Mary is GOOD at running.

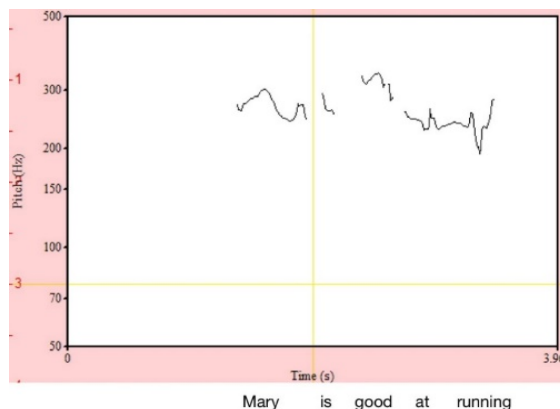
From the perspective of phonetics, it could be heard that the words *running*, *Mary* and *good* are respectively

the strongest or most prominent in each utterance. From another aspect of semantics, it is easy to see the three words carry the most salient or informative segments in respective sentence. To explore the relationship between pitch accent and meaning in a clearer way, files containing

the recordings of these utterances were imported in Praat. After drawing and extracting their pitch curves, the obtained graph for the neutral rendering (1) is shown in Figure 1, and the response in (1c) in Figure 2.



**Fig. 1.** Pitch curve for the neutral rendering of *Mary is good at running*



**Fig. 2.** Pitch curve for the version of *Mary is GOOD at running*

The pitch curve indicates the frequency at which the speaker's vocal cords vibrate, as it varies over time in Hertz.

In Figure 1, pitch maxima on *Mary*, *is*, *good* and *at* are quite similar, but that of the last word *running* is obviously higher, so it is perceived as the most prominent one here, which might be due to the new information it provides even in the neutral rendering.

In the second pitch curve, the location of *good* belongs to an identifiable local maximum in the pitch contour. Considering the corresponding context *Is Mary bad at running?*, the main prominence in response should lie in *good*, the rejection of false information or emphasis on truth, which has the exact discernible pitch maximum in the graph. Therefore, it demonstrates that there exists a correlation between pitch accent and meaning. Perceived prominence is always connected with such higher pitch accents. In other words, higher pitch accents normally convey the meanings of salience or newness in a particular phrase, which deserve more attention and psychological resources of listeners in conversations.

## 2.2 On Tune of English Sentences

As proposed by Pierrehumbert and Hirschberg [5], intonation patterns consist of stress, tune, phrasing and pitch range. Among them, “tune is the abstract source of fundamental frequency patterns”. As an intonational language, English has an abundant tune system, for which a monosyllable can be produced with various intonation patterns, declarative intonation and question intonation being prototypical two. As for pitch range, it “controls the graph paper on which the tunes are realized”. As the pitch range varies, so does the tune pattern.

In English, pitch can determine different patterns of intonation. The rise and fall of intonation mainly result from the rise and fall and width of pitch range of each syllable. When the pitch range of each syllable in the sentence decreases successively, it forms a falling tune, and continuous ascending to higher pitch in turn forms a rising tune. The pitch range of each syllable in a sentence can be relatively higher or lower. Hence, the rise and fall of pitch constitutes tune in speech. As the former case, two specialized contexts to lead to utterances including words *you*, *don't*, *like*, *green* and their responses are exemplified in (2a-b). The responses were recorded by the native

speaker in the same way, in which two words *you* and *green* were supposed to be pronounced with expectedly different tunes in two contexts.

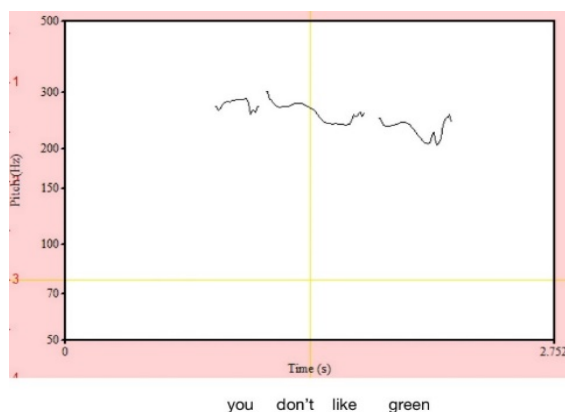
(2) *you*; *green*

a. I'm not into that green dress. — Yeah, you *don't* like *green*.

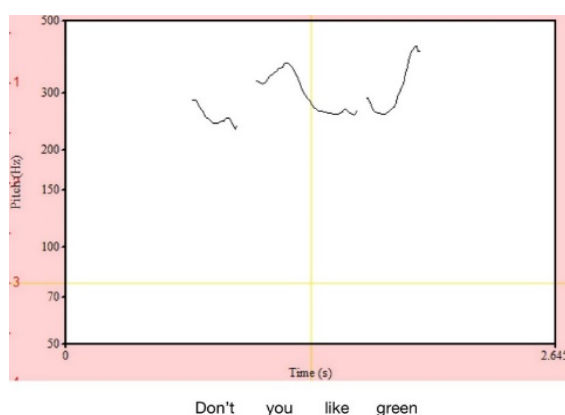
b. I'm not into that green dress. — Why? *Don't* you like *green*?

On the first response above, the pitch ranges of two words *you* and *green* in the recording are perceived to be

not very high and they are produced with a declarative intonation, while the pitch ranges of the same words in (2b) are obviously higher and are generated with a question intonation. To investigate the relationship between pitch and tune more directly, a pitch curve for a declarative response in (2a) is shown in Figure 3, as well as the questioned version in (2b) in Figure 4. Both of them are extracted from Praat.



**Fig. 3.** Pitch curve for the declarative rendering *you don't like green*



**Fig. 4.** Pitch curve for the questioned rendering *Don't you like green*

In Figure 3, the overall trend of pitch range of four words is relatively smooth, and their pitch maximum are similar as well. It means that no sharp rise of pitch or no obvious rising tune appears when producing this sentence with declarative intonation.

Comparatively, in Figure 4, the location of words *don't* and *like* show a clear downward trend in their pitch range, while words *you* and *green* mainly present an increase. Especially, at the end of the utterance, namely the word closet to the question mark, *green* indicated a most conspicuous rise of pitch, representing a typical rising tune. Hence, the sharper rise of pitch creates an obvious rising tune, which is normally observed in sentences with question intonation.

### 3 Conclusion

Pitch is the psychological association of the fundamental frequency of sounds and takes an important role in speech perception [8]. In the present study, the relationship

between pitch and English accent placement as well as tune has been focused and analysed. On the basis of previous research and current discussion, it could be concluded that the pitch level interrelates closely with these elements. As higher pitch always carries meanings of newness or salience, the placement of pitch accent tends to arouse a different psychological process of listeners and thus create a different understanding of the context. On the other hand, when pitches of consecutive syllables rise and fall and the pitch range is changed to some extent, the tune of intonation would vary as well, giving rise to diverse intonations and intentions of speakers.

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