

The Pitch Contour of Declarative Sentences in Urdu Language

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Abstract

This paper investigates the intonation contours in Urdu declarative sentences of Bahawalnagar district in Pakistan. For this purpose, three respondents are selected from the district. All the respondents use Urdu as their mother tongue while their parents are Punjabi speakers. The data is collected in the form of isolated sentences. Three repetitions each for intransitive, transitive and ditransitive are recorded for analysis. The results indicate that there is some variation in the intonation contours of declarative sentences but L H L- L% is the most frequently used pattern and does not change even as the sentence structure is modified due to the change in transitivity of the verbs.

1. Introduction

Intonation is an essential feature of any language, caused by changes in the pitch contour, and used by speakers to indicate a variety of linguistic phenomena. Speakers employ pitch to indicate whether they are stating something or asking a question. They also use pitch to indicate their emotional state, i.e. if they are angry, happy, surprised, etc.

These factors of an utterance are altered by simply changing its pitch contour. There has been very limited work on determining the intonation patterns for Urdu language. This work is an effort to understand Urdu intonation. This study aims to explore the range of pitch patterns available for the production of declarative sentences in Urdu and is part of a larger work which focuses on implications of first language (L1) intonation on English language learning (as L2), latter not discussed in the current paper.

2. Literature Review

Intonation may be defined as “the structured variation in pitch which is not determined by lexical distinctions.” [7, p. 253] Intonation is one of the widely discussed aspects of suprasegmental phonology. Intonation is generated by the rate of

vibration of the vocal cords [1] and perceived as the pitch contours [2, 3, 4]. Intonation is described as the selection of pitch ranges available to the speakers [5] and includes:

(a) categories of pitch 'peaks' and 'valleys' as well as their combinations at each sentence stress position (i.e., the last content word of the sentence), (b) types of pitch category concatenation, and (c) pitch of sentence fractions occurring before the first sentence stress. (p. 118)

These pitch ranges may be high or low and by exploiting these options, speakers convey linguistic and other information. In fact, many researchers claim that it is not easily possible for people to speak continuously in a monotone [1, 3, 6]. Intonation occupies a central position in speech production and perception.

The pitch contour of an utterance is usually denoted as a tone [3]. The pitch contour in an utterance may be rising, falling, falling-rising, rising-falling, level, high key and take-off [1, 2, 3, 4, 5]. Each of these contours performs different functions and is selected by the speakers on the basis of those functions.

Those languages of the world which have a fixed sentence order use pitch movements to convey emotions [5]. Generally pitch carries emotional information and the change in pitch does not change the meaning of an utterance. But there are certain languages of the world in which change in pitch contours results in change of meaning [4]. These languages are called tonal languages e.g. Punjabi [8] and Chinese. English is not a tonal language therefore pitch in English language is a superimposed feature which adds to the richness of meaning. For example, a simple declarative sentence may function as interrogative or exclamatory only by changing the tone of the utterance.

The pitch movement in English language has been studied with the help of Pierrehumbert's autosegmental metrical model of intonation. In [10], this model has been described comprehensively. She describes it as a collection of high (H) and low (L) target pitch targets. These targets are used in pre-nuclear and nuclear syllables, phrase accents (tone after the nuclear syllable) and at tone

boundaries (at the end of a phrase). There are a maximum of six tones available at pitch accent level: H*, L*, L+H*, L*+H, H !H*, and !H*. Here the star indicates tonal targets falling on stressed syllables. Similarly there are two possible phrase accents available i.e. L- and H-. According to this model, English uses two tone boundaries symbolised as H% and L%.

Pierrehumbert's model was later modified into Tone and Break Indices (ToBI) model [6]. This model has been divided into two entities: phrasal tones and pitch accents. The latter are further divided into phrase accents and boundary tones.

It further describes English intonation with the help of boundary index ranging from one to four. Closely joined words in a tone unit are given the index of one and the boundary index at the end of a sentence is always four [6]. This model has also been used to study Japanese intonation patterns [9]. This paper also attempts to study the use of intonation contours in Urdu declarative sentences by using ToBI.

3. Methodology

3.1. Population

Three respondents have been selected for this study from district Bahawalnagar. All the respondents are Urdu L1 speakers whose parents speak Punjabi as their mother tongue. All the respondents and their parents have spent their initial years of language learning in Bahawalnagar, so we can reasonably assume that they all belong to the same linguistic group.

3.2. Data collection

The data has been collected from respondents in the laboratory atmosphere. As the stress patterns and the syllable structure of the utterances are controlled in order to get valid results, it has been impossible to use naturalistic speech for this study.

This work is limited to the study of intonation patterns in declarative sentences in Urdu language. The data set is designed in the form of sentences. Each sentence comprises words carrying only mono or disyllable words. However, the final verbs in the ditransitive sentences are of three syllables. The data set is designed on the basis of sentence types. The types studied in this research are SV, SOV, and SOVO².

For each sentence type, three sentences have been devised and each speaker has pronounced three repetitions of each sentence. The data set is given in the table below.

Table 3.1. Data set for the analysis of declarative sentences

1	S V	ناز نے کھایا	Naz ate.
		ناز نے مارا	Naz hit.
		ناز نے گایا	Naz sang.
2	S O V	ناز نے تیر مارا	Naz hit with an arrow.
		ناز نے کھانا کھایا	Naz ate food.
		ناز نے گانا گایا	Naz sang a song.
3	SOVO ²	ناز نے زین کو کھانا کھلویا	Naz made Zain to eat food.
		ناز نے زین کو تیر سے مروایا	Naz got Zain killed with an arrow.
		ناز نے زین کو گانا گویا	Naz made Zain to sing a song.

The stress is controlled and all the utterances have been produced with stress on the first word (ناز, Naz).

In order to compare the results, an alternative way of structuring the Urdu sentences i.e. SVO has also been studied. The sentences with alternative word order have been pronounced by the respondents and their recordings analysed in order to examine if the verb/object replacement affects the intonation contour of a declarative statement in Urdu language. Here again the stress is placed on the first word of the sentence.

The data has been recorded in wav. format. A total of 486 recordings (3 participants * 3 repetitions) have been analysed using PRAAT software of speech analysis. The sound files have been manipulated to generate pitch contours. Each sentence has been separately analysed and the final contour generated by eliminating the redundant pitch points. The final speech pictures have been saved in an excel file. Then the contours have been determined and listed. The lists have been used to produce pie charts and percentages of usage of various pitch contours.

4. Results

4.1. SV

The results indicate that the most dominantly used intonation pattern in Urdu intransitive declarative sentences is L H L- L%. 67% utterances in the data have used this pattern. However, two more contours, i.e. L L- L% and L H H- L%, have been traced in the recordings. Nevertheless, their frequency of usage is lesser than the L H L- L% contour. The summary of the use of these contours along with the percentage of their respective usage is given in table 4.1.

Table 4.1. Summary of pitch contours used in intransitive declarative sentences in Urdu

Pitch Contour	Percentage
L H L- L%	67
L L- L%	26
L H H- L%	7

4.2. SOV

The results indicate that in transitive sentences, the frequently used pattern is L H L- L% which has 52% occurrences in the data. The remaining 48% of the data is divided into various contours such as L H H- L%, L L- L%, L L L- L%, H L- L%, L H H- H%, H L L- L%, L H L H L- L%. The summary of all the contours along with their percentage of usage is given in table 4.2.

Table 4.2. Summary of pitch contours used in transitive declarative sentences in Urdu

Pitch Contour	Percentage
L H H- L%	4
L H L- L%	52
L L- L%	11
L L L- L%	4
H L- L%	7
L H H- H%	3
H L L- L%	15
L H L H L- L%	4

4.3. SOVO²

Table 4.3 indicates that in ditransitive sentences too, L H L- L% contour covers 74% of the data. L H L L- L% contour comprises 15% of the data. With the addition of a low pitch accent, this contour may be merely an extension of the previously mentioned pattern. The other two contours, i.e. H L H- L% and L H L H- L% also share certain features with the previously mentioned contours as all of them share the low boundary tone (L%). The summary of the contours is presented in table 4.3.

Table 4.3. Summary of pitch contours used in ditransitive declarative sentences

Pitch Contour	Percentage
H L H- L%	4
L H L L- L%	7
L H L- L%	74
L H L H- L%	15

4.4. SVO

There is no definite sentence structure in Urdu language and SVO is perfectly acceptable and intelligible sentence structure for Urdu, albeit it is a feature of spoken language. This study sets out to

verify if the alternative sentence structure affects the pitch contour of Urdu declarative sentences.

The results indicate that the change in sentence structure does not affect its pitch pattern. Figure 4.4 indicates that 66% data comprises L H L- L% contour. However, a wide variety of pitch patterns have been used in this context. H L- L% contour covers 11% of the data and L H L L- L% covers 7%. The remaining contours, L H L H- L%, L H L L- H%, L L- L%, L H H- L%, encompass only 4% of the data each. The summary of all the contours used in this context is given in table 4.4.

Table 4.4. Summary of pitch contours used in SVO declarative sentences

Pitch Contour	Percentage
L H L- L%	88
L H L H- H%	4
L H L L- L%	7
L H L L- H%	4
H L- L%	11
L L- L%	4
L H H- L%	4

5. Discussion

The above mentioned results indicate that the predominant pitch pattern used for Urdu declarative sentences is L H L- L% with the overall usage of 65%. Moreover, the difference of transitivity does not influence the use of pitch contour in declarative sentences in Urdu. The intransitive, transitive as well as the ditransitive sentences use the same L H L- L% contour.

The study of the intonation patterns of declarative sentences of alternative sentence structure also corroborates the above mentioned findings. Although a variety of contours have been used in these utterances, the dominant pattern is L H L- L%.

Yet there are other contours which use or drop one or two additional phrase accent contours but may be interpreted as extensions of the basic L H L- L% pattern. These extension contours are L H L L- L%, L L- L%, H L- L%, H L L- L%, L H L H L- L%. A shared contour among all these patterns is the use of low tone boundaries. So we can claim that there may be differences in the use of low and high phrase accents but the predominant contour for the tone boundaries is low. The results indicate that only 3% of the utterances made use of high boundary tones.

6. Conclusion

This work has aimed to study and determine the pitch contour used by the Urdu sentence to

pronounce declarative utterances. It has proved that the major pitch contour to produce a declarative utterance is L H L- L%. It has also verified that transitivity and reverse sentence order do not affect the use of pitch contour in Urdu.

This study has pedagogical implications as it may help Urdu language teachers to teach the pitch contour accompanying declarative sentences in Urdu. It may also help them teach the variety of pitch contours available to pronounce a declarative utterance.

Furthermore, this work may be useful for the development of Urdu speech synthesis systems. The findings of this study may be used to improve the quality of those systems by identifying the principal contour used for declarative sentences in Urdu and by incorporating the variations in pitch contour that are possible in the production of Urdu declarative utterances.

However, there are many unexplored aspects of pitch contours in Urdu. This paper is limited to the study of declarative sentences only but other sentence structures such as interrogative exclamatory, imperative etc. have not been studied yet. Similarly, the change in pitch contour under the influence of different emotions also needs to be studied. The influence of complex sentence structure is yet another field that needs to be studied.

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