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Extended Abstract

Recognition of Imitative Tehrani Speech from a Standard Persian through Phonological Analysis of the Intonation Pattern in the Framework of the Taylor Tilt Model

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Introduction

The present study aims to investigate a set of acoustic parameters extracted from the intonation pattern of Kashani and Tehrani accents based on the acoustic approach and in the framework of Accent Forensic Comparison using the Tyler the tilt model, in order to introduce the most appropriate acoustic parameters that differentiate Imitative Tehrani (a speech in which Kashani's speaker tries to speak as close to Tehrani as possible) from standard Persian.

Materials & Methods

The subjects include 14 Kashani speakers (7 women and 7 men) with an average age of 23.30 years and 14 Tehrani speakers (7 women and 7 men) with an average age of 23 years, whose parents were born and live in the targeted cities (Kashan or Tehran).

The research data was collected in three stages and organized in three separate corpora. In the first stage, Kashani speakers participated twice in a 5-6 minute two-person conversation in a quiet place, away from ambient noise. The scenario of this conversation was set according to the limitations of the homogeneity of the number of syllables in the words and the absence of voiceless sounds, especially in the place of intonation. In the second stage, Tehrani speakers participated in the conversation in the same way. But in the third stage, Kashani speakers performed the scenario with Tehrani accent. In order for this

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imitation to be presented as smooth, fluent and comfortable as possible, the counterpart of each Kashani dialect in the conversation was a Tehrani dialect. Before the conversation, Kashani speakers were justified to imitate the standard type as much accurately as possible.

All conversations were recorded using a ZOOM H5 professional voice recorder and Pratt software version 6135 (November 29, 2020) with a sampling rate 44100 Hz and 16-Bit Depth.

After recording, 9 target utterances (3 affirmative, 3 interrogative utterances without question words, and 3 interrogative utterances with question words) were extracted from the conversations with syntactic order sov. Therefore, the total data of the research includes 756 utterances (9 sentences * 42 speakers -considering that Kashani speakers participate in 2 varieties of Kashani and imitative Tehrani: 14 utterances for each of Tehrani, Kashani and imitative Tehrani varieties- * 2 repetitions), where the share of each corpora is 252.

Then, segmentation and layering of phonetic data was done in the framework of Tyler Tilt Model. According to each audio file, a manual text grid in 3 layers including the phonetic level layer, the border layer of linguistic elements (boundary tone, nuclear pitch accent, silence and connection / continuity) and And the layer of falls and rises are created. After completing the labeling and layering stage, the acoustic correlations of (1) delay, (2) absolute amplitude (amplitude at the peak position), (3) rise amplitude (A_rise), (4) fall amplitude (A_fall), (5) rise duration (D_rise) and (6) fall duration (D_fall) are measured in the framework of Tyler Tilt Model for two linguistic elements of intonational and border tone in each sentence. Then (7) the tilt is calculated for the two language parameters of intonational and border tone (14 parameters in total). All the numerical values obtained from the measurement of the parameters were stored in SPSS.

Results& Discussion

Analyzes and reviews in this research were done in three separate sections based on the subject, which are as follows:

• The comparison of the curve of intonational changes in the two accents and the values of the acoustic parameters, as well as the comparison of the non-acoustic, linguistic and phonetic parameters, shows that Kashan speakers have a significant ability to control the linguistic and non-acoustic parameters in imitating the standard accent, and eliminating the phonemic special rules of Kashani variety. The position of pitch accent in the verb structure and the place of tone of cravding also changes in the Tehrani variety of Kashani towards similarity with the Tehrani variety. Therefore, Kashani speaker is successful in imitating the standard variety in terms of phonetic, non-linguistic and curve of the intonation pattern. Also, Kashani speaker is successful in assimilating the acoustic parameters of the continuous affirmative utterance.

• According to the statistical findings, the parameter of tilt of pitch accent distinguishes the interrogative utterances of two varieties of original Tehrani and imitative Tehrani with a Confidence factor of 95%. General observations showed that the Kashani dialect does not

succeed in imitating the Tehrani variety in interrogative parts of speech with question-words, and the tilt values are discriminating. The distinguishing parameter in the acoustic domain to identify the original Tehrani variety from the imitative variety is the value of the tilt parameter, which can be seen in the shape of tone of cravding at the beginning of the speech segment.

• The tone construction of interrogative curves (without interrogatives) in original Tehrani and imitative Tehrani varieties is L*+HL-, and their tone curve ends with a high pitch (H%). The last syllable of the verb is the place of tone of cravding, which leads to the elimination of the edge tone of L-. The tilt of both linguistic elements in these utterances is completely rise, and is equal to +1, and therefore has no discriminative power, while the parameter of the rise amplitude of the pitch accent in combination with the final pitch has the potential to distinguish the imitative variety. Kashani speaker does not succeed in imitating in this kind of utterances of Tehrani.

Conclusion

In this experiment, the curve of intonation pattern changes and the numerical values of 14 parameters for affirmative sentences, questions (with question words) and questions (yes/no) first for the continuous utterances of Kashani male and female speakers, and then for the continuous utterances of Tehrani male and female speakers was investigated and measured in order to obtain a standard for comparing and distinguishing these two language types. The results of the analyzes are presented by using the grid text, the curve of intonation pattern changes, measuring the acoustic and listening parameters, and performing statistical tests for 3 kinds of sentence, and the results of the analysis on their pitch curve, and the final results are presented:

Kashani speaker is successful in imitating the standard variety in terms of phonetic, non-linguistic and curve of the intonation pattern, also in assimilating the acoustic parameters of the continuous affirmative utterance. But he/she does not succeed in imitating interrogative utterances without and with question words.

Keywords: Intonation, Forensic Phonology, Tyler Tilt Model, mimicry, Standard Persian Accent

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