

# THE OCCURRENCE AND PITCH PATTERNS OF PHRASE-FINAL RISING IN TOCHIGI JAPANESE

*Keiichi Takamaru*

Faculty of City Life Studies, Utsunomiya Kyowa University, Japan

takamaru@kyowa-u.ac.jp

## ABSTRACT

This paper focuses on the phrase-final rising in Tochigi Japanese. It is said that Tochigi Japanese tend to raise their phrase-final frequently. In this paper, I have confirmed two things. One is that the position of occurrence of phrase-final rising in Tochigi Japanese is not so different from rising or rising-falling intonation in standard Tokyo Japanese. The other is that there is an evident perceptual threshold in the degree of rising between Tochigi Japanese and standard Tokyo Japanese. I conclude that the difference between phrase-final rising in Tochigi Japanese and rising intonation in standard Tokyo Japanese is not their positions of occurrence but the gradient of rising.

**Keywords:** rising intonation, particle, Japanese dialect, phrase-final rising, Tochigi Japanese

## 1. INTRODUCTION

Tochigi Japanese has several differences in pitch pattern features compared to standard Tokyo Japanese [1]. The first difference is that Tochigi Japanese has an accentless system whereas Tokyo Japanese has a multi-pattern pitch accent system. The second one is phrase-final rising (so-called ‘*shiriagari*’ in Japanese). Morishita [2] says that phrase-final rising and flat intonation are used in most areas in Tochigi Prefecture (excluding the Ashikaga-shi area.) A phrase-final portion rises when a speaker talks with pauses between phrases. The whole sentence becomes flat when a speaker talks continuously without pause. Flat intonation beyond a sentence seems to be caused by this accentless system. At the end of a phrase, a pitch rises frequently whether it is an interrogative sentence or not.

It is conventionally considered that the phrase-final rising of Tochigi Japanese occurs frequently regardless of the function and it rises higher than rising intonation of standard Tokyo Japanese. The purpose of this study is to confirm these two features of phrase-final rising of Tochigi Japanese.

This intonational feature of Tochigi Japanese is just called “phrase-final rising”, however it seems to include both rising and rising-falling intonation in types of phrase-final intonation in standard Tokyo Japanese. A rising intonation is mainly for interrogative sentences in standard Tokyo Japanese. A rising-falling intonation is often used at the phrase-final position to emphasize the phrase or to express continuation of talking. It is known that such rising-falling intonation is mainly used by young female speakers. According to Sasaki-Hara [3], it appears at the following four kinds of positions: (i) conjunctions and conjunctive particles such as */kara/*, */node/*, */tara/* and */keredo/*, (ii) particles used for enumeration of examples such as */toka/* and */shite/*, (iii) adverbs */mazu/*, */yappari/* and conjunctions */demo/*, */dakara/* and (iv) the supplementary particle */wa/* for thesis or contrast. Inoue [1] points out that phrase-final rising in Tochigi Japanese has a different nature from rising-falling intonation in Standard Tokyo Japanese in terms of position of occurrence and pitch pattern. However, he does not refer to their concrete differences. It seems that phrase-final rising in Tochigi Japanese has higher frequency and a higher degree of rising than rising-falling intonation in daily observations.

The first target of this study is which phrases rise in Tochigi Japanese. The second one is to what degree phrase-final portion rises in Tochigi Japanese and whether a perceptual threshold exists between phrase-final rising of Tochigi Japanese and that of standard Tokyo Japanese.

## 2. OCCURRENCE OF RISING INTONATION

In this section, I investigate the position of occurrence of phrase-final rising in Tochigi Japanese. Two kinds of spontaneous conversational speech are prepared as speech samples. These are uttered by female speakers who were born in the northern part of Tochigi Prefecture. One is by an elderly speaker, who was born in 1909. Conversational speech by three

males and one female was recorded in 1979 and is contained in a CD-ROM published by the National Institute for Japanese Language and Linguistics<sup>1</sup>. The other is a young speaker, who was born in 1985. Conversational speech by two people was recorded in 2010 by the author. The length of speech samples are shown in the last two rows of **Table 1**.

### 2.1. Comparison of elderly and young female speakers

Each sample was heard by three people including the author. The phrases which have phrase-final rising are extracted by listening. **Table 1** shows the position of occurrence of phrase-final rising, *i.e.* sentence-final or not. **Table 1** also shows the co-occurrence between phrase-final rising and postpositional particles.

**Table 1:** Co-occurrences between rising intonation and postpositional particles.

Type of Particles	An Elderly Speaker	A Young Speaker
<b>At Sentence-final Position:</b>		
Sentence-ending particle: /ne/	9 (64%)	1 (2%)
Sentence-ending particle: /yo/	1 (7%)	1 (2%)
Sentence-ending particle: /kai/	1 (7%)	0 (0%)
<b>At Non Sentence-final Position:</b>		
Interjectory particles	0 (0%)	5 (12%)
Conjunctive particles	0 (0%)	22 (54%)
Other particles	3 (21%)	10 (24%)
∅ (no particles)	0 (0%)	2 (5%)
<b>Total</b>	<b>14 (100%)</b>	<b>41 (100%)</b>
Length of Utterances (mm:ss)	02:51	04:26
Length of Recordings (mm:ss)	37:11	11:29

### 2.2. Results

These two samples have differences in terms of length of utterances and their content. Thus co-occurrence frequencies cannot be compared directly. However there are several salient differences between the elderly speaker and the young speaker. From **Table 1**, following features are observed:

1. 78% of phrase-final rising by the elderly speaker are co-occurring with sentence-ending particles. Most of them (64%) are co-occurring with the sentence-ending particle /ne/.

2. Two examples of phrase-final rising by the elderly speaker are co-occurring with the supplementary particle /wa/ used for thesis or contrast at the phrase-final (not sentence-final) position.
3. Almost all of the phrase-final rising by the young speaker occur at a non-sentence-final position. (96%)
4. Phrase-final rising by the young speaker has a tendency to co-occur with the conjunctive particles /kara/, /kedo/ and /te/.
5. In the informal hearing by some researchers, phrase-final rising by both elderly and young speakers seemed to have shape variation of their pitch patterns compared to standard Japanese's rising or rising-falling intonation.

### 2.3. Considerations

#### 2.3.1. An elderly speaker

The sentence-ending particle /ne/ usually expresses confirmation of agreement. Rising intonation is used at such a portion even in Standard Tokyo Japanese. The difference is that both rising and rising-falling form is used by elderly Tochigi Japanese.

It can be thought that the phrase-final rising at the supplementary particle /wa/ is prominent at a particle position. These features are not so different from those of rising intonation in standard Tokyo Japanese. The positions of phrase-final rising in elders' Tochigi Japanese also tend to rise in standard Tokyo Japanese.

#### 2.3.2. A young speaker

The positions of phrase-final rising of a young speaker in Tochigi Japanese correspond well to those of rising-falling intonation in standard Tokyo Japanese which is mentioned above. Thus the young speaker in Tochigi also uses the rising-falling intonation which is used by the young female. However, the shapes of their pitch patterns seem to be different from standard Tokyo Japanese.

#### 2.3.3. The position occurrence of phrase-final rising in Tochigi Japanese

From these results, the positions of occurrence of phrase-final rising in Tochigi Japanese are basically the same as rising or rising-falling positions of standard Tokyo Japanese in both elderly and young speakers.

As described above, there are two major features of phrase-final rising in Tochigi Japanese

which are conventionally pointed out, i.e. "rising frequently" and "rising abruptly". From this study, I confirmed that the first feature "phrase-final position rises frequently" does not apply to Tochigi Japanese. The second feature of the phrase-final rising is examined in the next section.

### 3. DEGREE OF RISING

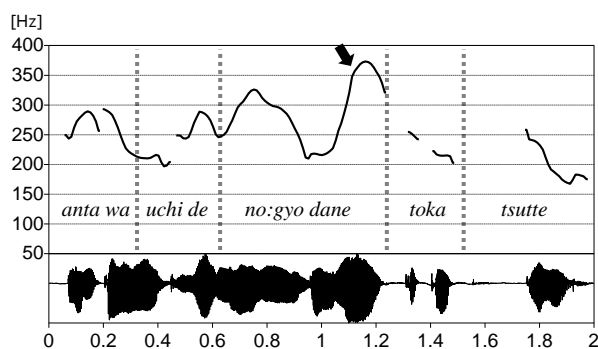
Most of the present young people in Tochigi acquire standard Tokyo Japanese and they can switch between both dialects depending on the person to whom they are speaking [5]. The question in this section is whether there is a perceptual threshold of the degree of rising between phrase-final rising in Tochigi Japanese and that in standard Tokyo Japanese for them.

#### 3.1. Setting of the auditory test

##### 3.1.1. Preparing for the speech data

One typical example of phrase-final rising is chosen from a young speaker's spontaneous speech samples used in section 2. The whole sentence of the typical example is shown in **Figure 1**. The third phrase "no:gyo:dane" is used as the target phrase of the auditory test. This is because there are no dialectal pitch or segmental features excluding phrase-final rising. Namely the former portion "no:gyo:da" seems to be uttered in standard Tokyo Japanese and the final mora "ne" seems to be uttered with the phrase-final rising of Tochigi Japanese.

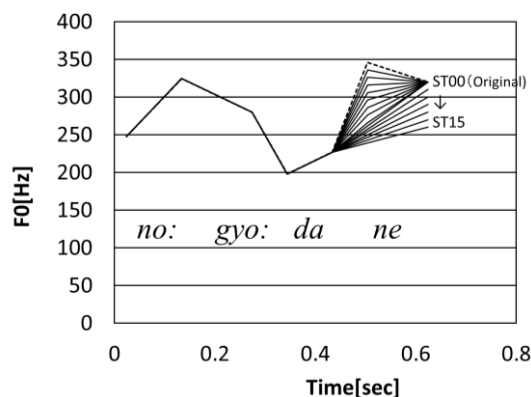
**Figure 1:** Typical Example of Phrase-final Rising in Spontaneous Conversational Speech (The meaning of the utterance is "He said that you should do farming as a family business").



The pitch pattern of the final mora "ne" in the phrase "no:gyo: dane" is manipulated by using Praat<sup>2</sup>. As illustrated in **Figure 2**, the gradient of the stylized rising pitch is made lower. The F0 peak in original speech (ST00) is made lower by 10[Hz]

(ST01 to ST08). The final F0 is made lower by 10[Hz] after the F0 pattern in "ne" becomes straight (ST09 to ST 15). After this, the sixteen types of stimuli (ST00 to ST15) are made. The re-synthesizing of stimuli is carried out by using the "over-lap add" method implemented in Praat.

**Figure 2:** Pitch Patterns of the Stimuli.



##### 3.1.2. Subjects

The subjects of the auditory test are seven people (one male and six females) who were raised in Tochigi prefecture. Their ages range from nineteen through twenty-two years old. Before the auditory test, I confirmed that all of them use both Tochigi Japanese and standard Tokyo Japanese, and they can distinguish one from the other.

##### 3.1.3. The auditory test

The multiple forced choice (MFC) experiment implemented in Praat is used for the test. The 16 kinds of stimuli are presented 5 times. The total number of presented samples is 80.

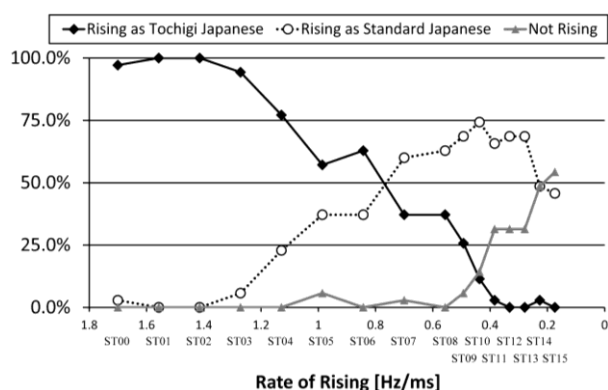
The subjects are instructed to hear the "ne" in "no:gyo: dane" and choose whether it is "rising of Tochigi Japanese", "rising of standard Tokyo Japanese" or "not rising" on the GUI.

#### 3.2. Result of the auditory test

The result of the auditory test is shown in **Figure 3**. The x axis of the figure shows the gradient of the final rising. In case of ST 00 to ST08 former larger gradient is used. The judgment of Tochigi Japanese vs. standard Tokyo Japanese changes between ST06 and ST07. The judgments of "rising as standard Tokyo Japanese" and "not rising" are almost same in ST14 and ST15. The subjects perceive the rising as the phrase-final rising of Tochigi Japanese when the rate of rising exceeds 0.8 [Hz/ms] within this stimuli. There are no

stimuli that are perceived without three choices in the introspective reports.

**Figure 3:** The Result of the Auditory Test.



### 3.3. Considerations

A chi-square test of independence between the judgments of “rising as Tochigi Japanese (RaTJ)” and those of “rising as standard Tokyo Japanese (RaSJ)” is carried out<sup>3</sup>. The p-value of the test is less than 0.0001. Namely there are significant differences between the judgments of RaTJ and those of RaSJ

The result of the residual analysis is shown in Table 2. In this table, the boxed values are significant high at 1% significance level (>2.58). The RaTJ is significant high at ST00 to ST04. The RaSJ is significant high at ST09 to ST15. Thus young people in Tochigi perceive the phrase as Tochigi Japanese when the final rising exceeds around 1.1 [Hz/ms].

**Table 2:** Normalized residuals of the chi-square test.

	ST00	ST01	ST02	ST03	ST04	ST05	ST06	ST07
RaTJ	5.63	5.98	5.98	5.28	3.17	1.10	1.41	-1.59
RaSJ	-5.63	-5.98	-5.98	-5.28	-3.17	-1.10	-1.41	1.59
	ST08	ST09	ST10	ST11	ST12	ST13	ST14	ST15
RaTJ	-1.75	-2.87	-4.30	-4.74	-5.16	-5.16	-3.96	-4.18
RaSJ	1.75	2.87	4.30	4.74	5.16	5.16	3.96	4.18

### 4. CONCLUSIONS AND FUTURE ISSUES

In this paper, I have considered the phrase-final rising of Tochigi Japanese. It has been compared with the rising or rising-falling intonation of standard Tokyo Japanese in terms of positions of occurrence and gradients of rising.

It is conventionally said that Tochigi Japanese tend to raise their phrase-final frequently. However, I have found that the positions of occurrence have similar tendencies to standard Tokyo Japanese from the results of the co-occurrence analysis of

rising portions and particles in both elderly and young spontaneous conversational speech. In the elderly speaker, the positions of phrase-final rising correspond to rising intonation in standard Tokyo Japanese. In the young speaker, they correspond to rising-falling intonation used by young female speakers of standard Tokyo Japanese.

It is also found that phrase-final rising is perceived as a Tochigi Japanese dialectal phenomenon when the degree of rising exceeds a certain threshold. People who know both standard Tokyo Japanese and Tochigi Japanese can distinguish each by the pitch patterns of phrase-final rising.

From these two results, Tochigi Japanese rises abruptly at almost same positions compared to Tokyo Japanese. Namely the phrase-final intonation of Tochigi Japanese does not rise frequently but steeply.

The problem of duration of the final mora will be examined as a future issue. The phrase-final rising of Tochigi Japanese should also be compared with rising-falling intonation of Tokyo Japanese as another future issue.

### 5. ACKNOWLEDGEMENTS

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<sup>1</sup> *Furusato Kotoba Shuusei (Tochigi Ibaraki Hen)* CD-ROM (2002.7)

<sup>2</sup> <http://www.fon.hum.uva.nl/pmaat/>

<sup>3</sup> “not rising” is excluded from the test because the values are too low.