

Comparison of Declarative-Interrogative Intonation in Lampungnese

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Abstract

Intonation is a suprasegmental feature of language that constructs the meaning of utterances. The meaning constructed can be different from the lexical meaning and syntactical structure. This paper tried to examine the intonation system in the Lampung language, especially the acoustic characteristics which distinguish between declarative and interrogative. In this research, the researcher applied the IPO approach to collect and analyze data. Data were gathered by recording native speakers uttering declarative and interrogative sentences that were segmentally identical. Having the data, a perception test was conducted to get the best utterances for each mode as a contour prototype. Next, both prototypes were analyzed respectively using Praat software to find out each acoustic characteristic. Then, they were compared to find the suprasegmental features that characterize the acoustic features of each sentence mode. Based on the analysis, both intonations differed in the pitch of initial, final subject constituent, final complement constituent, initial predicate constituent, final pitch, peak, range of pitch, and duration of utterances. In addition, pitch of peak (H1) and slope (H2) were identified as the most influential component in the formation of a sentence model. Therefore, experiments of manipulating those acoustic features (H1 and H2) and testing them on the perception of native speakers were held to prove the identification. The result of the perception test showed that the peak significantly distinguished the mode of the sentence, the higher pitch of the peak determined the interrogative mode. While the second identification did not give any contribution in creating the meaning.

Keywords: Intonation, Lampungnese, phonetic experimental

Introduction

Speaking without intonation is like speaking into a machine (Nolan, 2008). From the statement, it can be inferred that intonation is important in speaking. What is intonation? Physically, intonation is the assemble of pitch variations in speech caused by the varying periodicity in the vibrations of the vocal cords (*'t Hart et al., 1990*). Linguistically, intonation is a suprasegmental or prosodic component in the form of pitch pattern that influences perception and is able to build different meaning from its lexical and structure (Sidauruk, 2017; Zsiga, 2016). From those definitions, it can be stated that intonation creates the meaning of utterances non lexically. In other words, meaning is formed not because of 'what do you say' but 'how do you say' (Jeong, 2018). Nolan (2008) and Prieto & Borràs-Comes (2018) said that this phenomenon occurred since intonation conveyed linguistic information (sentence form; declarative or interrogative) and paralinguistic information (emotion and mood). Besides, Ball and Müller (2014) stated that intonation gave syntactic and semantic signals. Syntactically, it indicates whether the utterance is finished or not and highlights the structure of the sentence, such as a major and minor unit in a sentence (Ball & Muller, 2014). While semantically, it indicates beyond the meaning of the structure, such as attitude, such polite or impolite, emotional condition, such as anger, joy, neutral, (Chuenwattanapranithi, Xu, Thipakorn, & Maneewongvatana, 2017; Rodero, 2011) and

purpose such as declaring, commanding, or questioning. Moreover, Levon (2016) found that intonation gave a social effect and represented the social class of the speaker. Above all, intonation results in significant enrichment of models in discourse context (Farkas & Roelofsen, 2017). In an intonation, there were some features that needed to be analyzed, such as duration, intensity, pitch, sound quality, and other prosodic elements (Nolan, 2008).

The urgency of intonation in a language is important so that all languages own the feature, except the Amahuaca language (Bolinger, 1972). The intonation system from one language to another is different. Although they are different, there is the universality of basic intonation which generally can be found in almost all languages. Bolinger (1972) said that 70% of the language in the world use high-raising, called *inclination* intonation as a sign of interrogatives, and the rest also use the higher pitch for interrogative rather than declarative although the pattern gets falling down, called *declination*. In line with that, Westera (2017) and Lakoft (2004) said, when a high-raising was applied to a declarative sentence, the declarative would be accepted as the interrogative. The phenomenon was found in some research, for example in Jeong (2016, 2018). In his experimental study, it was found that "*Low raising slopes were significantly more likely to signal declarations, high rising slopes were significantly more likely to signal interrogatives.*" A similar result was discovered also by Gunlogson (2003) who proved that raising and falling intonation in English declarative sentences distinguish the mode of a sentence uttered. He further explained that the sentence *It is raining* which was structurally declarations would be considered as declaration if declination was applied, while it would be considered as interrogation when raising inclination was applied to the sentence. Another similar finding came from Sugiyono (2007) in his experiment on Indonesian intonation patterns. He said that the mode of an interrogative sentence is indicated by higher pitch and inclination while a declarative one was indicated by declination. And, the peak tone of an interrogative was earlier than the declarative. After having the pattern, Sugiyono proceeded to an experiment which consisted of manipulating contour and testing it to find constituents which significantly influenced the meaning. His result showed that the higher peak and final tone would increase the acceptability of the utterance as an interrogative sentence. However, there is a threshold which limits those segments. The threshold is 12 semitone (st) for the peak and 18 st for the final tone from the basic contour. Raising tones more than the threshold reduces acceptability.

Different from the previous finding, Yanita and Sekarwati (2015) found that interrogative mode in *Bahasa Bima* had a lower pitch for the final tone rather than the peak. Moreover, the peak of declarative intonation is higher than the interrogative one. This against the theory of Bolinger (1972). This different pattern explicitly says that the research on the intonation must be continued for the reference of language understanding. Moreover, language contact and culture shock cannot be denied today. Therefore, understanding other language intonation systems is important. Especially for people in the multicultural area, they must understand the intonation system of each other. Due to misinterpretation of intonation causes ineffective communication, pragmatic failure (Gunlogson, 2003), even conflicts (Juariyah, 2012).

One multicultural area is Lampung province. In the province, there are minimally six languages used for daily communication (Badan Pengembangan Bahasa dan Perbukuan '*Language and Book Development Agency*', 2019). Despite those languages generally uttered by their native speakers, interaction among them cannot be avoided. Therefore, this paper was an attempt to achieve the pattern of Lampungnese declarative-interrogative intonation, as the local language in the province so that both sides of Lampungnese and non-Lampung will more understand the intonation pattern and avoid misinterpretation.

This current analysis is conducted with some purposes, they are:

1. What indicator distinguishes the intonation of the Lampungnese declarative-interrogative sentence?
2. Which constituent in the intonation suprasegmental plays a significant role as an interrogative marker?

Theory and Method

Eckert and McConnell-Gine (2003) and Lakoft (Lakoft, 2004) pointed out that the interrogative mode of a sentence was signed by a high-rising pattern. In intonation, the height of pitch cannot be considered as high or low except it is compared to other constituent pitch, it can be constituent pitch from the same contour or other contours (Halim, 1984). Based on Eckert, P. and McConnell-Gine, S (2003) and Lakoft (2004), the word 'high' there means the pitch of interrogative intonation is higher than the pitch of declarative intonation. While the word 'raising' means the beginning pitch is lower than the final one, or it is called inclination. The antonym of inclination is declination. The theory was qualitatively applied to this current study to analyze the comparison of declarative-interrogative intonation contour in Lampungnese. Besides, the researcher applied *IPO*, 'Institute voor Perceptie Onderzoek' by Hart, et al (1990) as the approach. The method can count intonation features accurately (Heryono, 2019). There are three steps of analysis in IPO; (1) producing acoustic data, (2) analyzing the acoustic characteristics, and (3) is testing perception. For the analysis of pitch, the researcher used a unit of *semitone* with reference 130,7749 Hz as Sugiyono (2007) applied.

Data used in this study were utterances recording in Lampungnese *API* dialect. The dialect was chosen because it is spoken by the largest number of Lampungnese speakers (Badan Pusat Statistik 'Central Bureau of Statistics', 2000). Data were collected by recording four subjects casting based on dialogs created as the research instrument for this purpose. Subjects were native speakers of Lampungnese, 20 – 40 years old, not having the linguistic background, physically normal, and using Lampungnese in their daily communication. The dialogs were designed to help the researcher obtaining the two sentences which are segmentally identical but suprasegmentally different. This segmental identical element would ease researcher comparing those two modes of the sentence (Mubin, 2020). Those dialogs are below:

Dialog 1. designed to obtain declarative intonation

- Mad : *Pah mengan wah* 'let's go eating'
/pah məŋan wah/
Redi : *Wat kan kudo?* 'Is there any rice?'
/wat kan kudo/
Mad : *Wat, mamahku ghadu nasak* 'Yes, there is. My mother has cooked'
/wat/ /mamahku ɣadu nasa?/

Dialog 2. designed to obtain interrogative intonation

- Redi : *Mad, nyak ampai mengan di nuwamu* 'Mad, I just ate at your home'
/mad/ /ɲa? ampaɪ məŋan di nuamu/
Mad : *Mamahku ghadu nasak?* 'My mother has cooked?'
/mamahku ɣadu nasa?/
Redi : *Ghadu wah, bangik* 'Yes, she has. It was delicious'
/ɣadu wah, baŋi?/

Target Sentences: Mamahku ghadu nasak
My mother have cooked
S C P (Grammatical function in Lampungnese pattern)

Each subject was asked to read the dialog as Mad while the researcher read as Redi. This role was set since the target utterances in parts of Mad only. The dialogs were recorded three times for each informant to get comparison data. The recording process had to be produced as natural as possible without any emotions affecting the speech since emotion influences the utterances. Besides, the recording had to be clear and clean so it could be easily analyzed. Therefore, the dialogs were recorded by *Samson C01* microphone, *Focusrite Solo Gen3* Sound Card, and *Asus A412DA* laptop. Those tools are at the standard level for recordings. The recording was saved in *waveform* format so that the range of frequency was full. The full frequency will give listeners a clear and complete sound. From this process, there were 12 utterances for each declarative and interrogative sentence obtained (4 subjects x 3 times).

Having the recording, steps of data processing were begun. First, each dialog recording was edited using software *Audacity* to cut some parts of dialog so only the target utterances remained as data. Second, data were named by coding D, D for declarative, and I for Interrogatives in initial attached by number, for example, D1, D2, and I3. Then, all data were tested on the respondent to find the best contour representing each mode based on their perception. Respondents consisted of 20 people with the same condition as the subjects. In the test, all data were played one by one without any explanation about each type and context. This process was also done one by one with each respondent. For the assessment, respondents were asked to fulfill the table given consisting of three assessments; *unclear*, *clear*, or *very clear* after listening to each datum. The best assessment of both sides would be considered as the contour prototype which would be analyzed to find out each acoustic characteristic so that the two contours could be compared. In this analysis, the process of analysis was done using the software *Praat*.

Next, after getting the acoustic characteristic, those two contours were compared to find out their suprasegmental difference. After that, the difference was analyzed using *Praat* to find the most influential constituent in the formation of interrogative sentences. Furthermore, the constituent was manipulated (to be higher or lower based on its difference from the declarative intonation contour) to create some variant of contour. Finally, the perception test was held to prove how significant those constituents play the role of an interrogative mode marker. This test resulted in a stronger judgment for the conclusion. In this test, respondents consisted of 30 people with the same criteria as those who were previously involved.

Findings and Discussion

The prototype of Intonation Contour and Comparison

From the first test, it was obtained the prototype of both declarative and interrogative intonation contours. Both of them achieved a 100% very clear response which it did not achieve by other data. They were datum D9 and I4. Each acoustic characteristic can be seen in each figure of intonation contour.

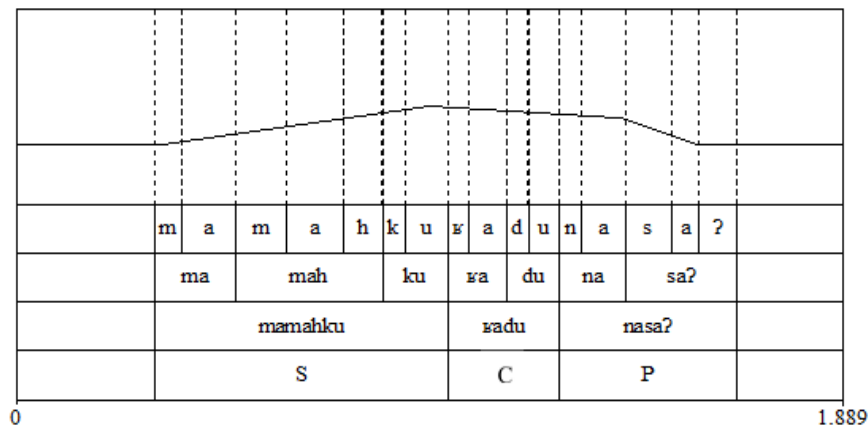


Figure 1. The prototype of Lampungnese declarative intonation contour

Figure 1. is the prototype of Lampungnese declarative contour. At the beginning of the contour, the pitch touches 10st. The pitch flows up to the final constituent of the subject touching 16.25st. Then, the pitch flows down touching 14.4st on the initial constituent of the verb. Next, the pitch falls down at the end of the contour or at the final sound touching on 10.25st. From the acoustic characteristic, it is noticeable that the type of declarative contour is inclination, the tone range of contour is 6.25st, and peak is the final constituent of the subject. In addition, the contour duration is 1.2 seconds long.

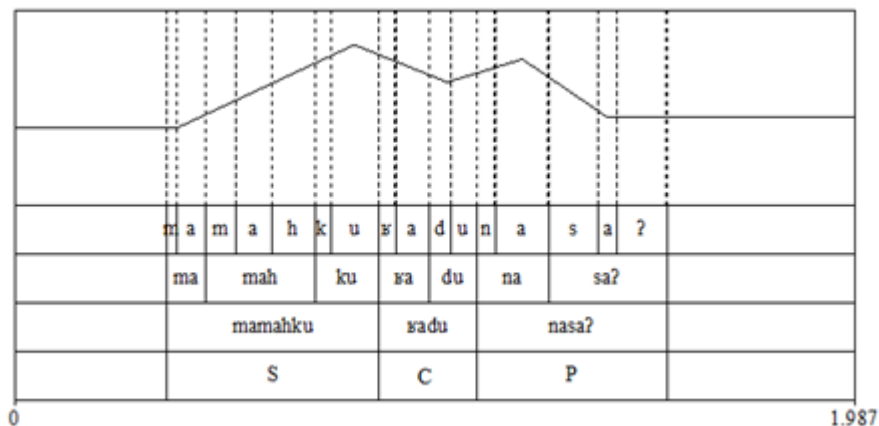


Figure 2. The prototype of Lampungnese interrogative intonation contour

Figure 2 is the prototype of Lampungnese interrogative contours. The acoustic contour above begins at the pitch of 19.9st. Next, the pitch flows touching 26.03st in the final constituent of the subject. Furthermore, the tone flow falls down to 20.61st in the final constituent of complement. After that, the pitch gets up to 23.84st on the initial constituents of the verb. At the end, the tone is closed in the pitch of 14.52st. Based on the acoustic characteristic, it can be noted that type of Lampungnese interrogative contour declination, the tone range is 12st, and the final constituent of the subject is the peak. In addition, the contour duration is 1.2 seconds long.

From the two contours above, some similarities and comparison are found. The first similarity, the pitch peaks are located in the final constituents of the subject. This opposes Sugiyono (2007) who stated that contour peaks in interrogative intonation came earlier than in declarative intonation. Second, there is a tone point in the initial constituent of the predicate. This point is stress intonation in both intonations which indicates the utterance will be finished just in one syllable after the point. Previously, the indication had been

visualized in two contours of Indonesian declarative and interrogative sentences spoken by speakers in Lampung documented by Reranta (2017).

On the other hand, differences between both intonation contours were found more than the similarities. The first difference, interrogative contour pitch tends to be higher than declarative contour pitch, from the initial pitch, peak, until the final pitch. Automatically, it causes the second difference, which is the range of interrogative contour which is two times wider than the declarative contour. These two differences are in line with Gunlogson (2001), Jeong (2018), Lakoft (2004), and Sugiyono (2007). The third, the slope of interrogative contour consists of two slopes while the declarative contour consists of one slope only. This states that the interrogative tone flow is more varied. Moreover, the slope is steeper since the pitch gets up and down significantly. Fourth, inclination appears in declarative contour while declination appears in interrogative contour. These characteristics are similar to the intonation contour of Bahasa Bima as Yanita & Sekarwati found (2015). Certainly, it is against the dominant intonation contour type of all languages as mentioned by Bolinger (1972) and Lakoft (2004). Moreover, it is different from the pattern of Indonesian intonation contour by Sugiyono (2007), the close language to Lampungnese. Furthermore, there was a difference in duration but it was not significant because the declarative contour is only 0.01 seconds longer than the interrogative contour. The difference cannot be detected by common human beings. Those comparisons can be seen in Table 1. below:

Table 1. Acoustic characteristics of declarative and interrogative intonation in Lampungnese

No	Contour	Declarative	Interrogatives
1	Initial pitch	10 st	19,19 st
2	Final subject constituent (Peak)	16,25 st	26,30 st
3	Final complement constituent	-	20,61 st
4	Initial predicate constituent	14,4 st	23,84 st
5	Final pitch	10,25 st	14,52 st
6	Range of pitch	6,25 st	12 st
7	Duration	1,31 s	1,2 s

Based on the comparison above, it can be taken two hypotheses regarding the mode marker of interrogative intonation contour:

1. The higher tone of the final subject constituent determines the interrogative sentence (H1)
2. The slope in the final complement constituent determines the interrogative sentence (H2).

Experiment and Perceptual Test

Responding to the hypotheses, this experiment and the perceptual test will be done respectively in two steps, each is to test each hypothesis.

1. Experiment and perception test on H1

H1 mentions that the higher tone of the final subject constituent determines the interrogative sentence. Therefore, the experiment was done by raising the pitch of the final subject constituent. The pitch is raised three times with 1st for each rise as stimulus in this experiment. Those stimuli were coded D1a (first rise), D1b (second rise), and D1c (third rise). Those stimulus contours can be seen below:

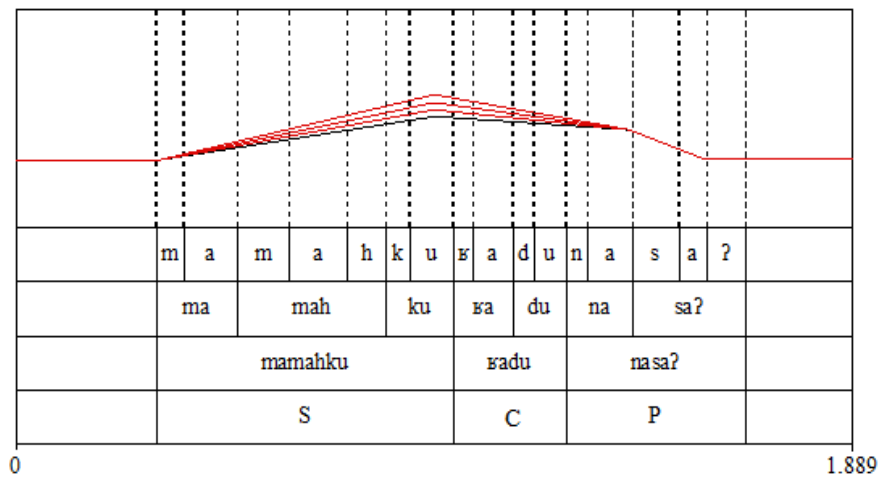


Figure 3. The stimulus of D1a, D1b, and D1c

The stimulus is then tested perceptually by respondents. From the test, the perception of native speakers on the stimulus was obtained. Those perceptions can be seen as mentioned in the following table:

Table 2. Assessment of perceptual test on H1

Stimulus	Respond		Acceptability (%)		
	Dec	Int	Dec	Int	Significance as an Interrogative Sentence
Declarative	20	0	100	0	Not significant
D1a	6	14	30	70	Less Significant
D1b	5	15	25	75	Significant
D1c	1	19	5	95	Very Significant

In the table above, the percentage of stimulus assessments gets a greater value from D1a to D1c. First, the contour of declarative sentences was rejected as interrogative sentences. This was logical since the contour was not manipulated. Next, the raising tone of 1st in the constituent of the final subject influences the meaning and perceptions. The significance is getting better from 'not significant' to 'less significant'. Furthermore, raising the constituent affects more influences to the mode of sentences from 'less significant' to 'significant'. The rest, the raising pitch in the point forms the sentences as interrogative. These results indicated that the tone of the final subject constituent influences the mode of sentences suprasegmentally. However, H1 is scientifically accepted. This answers the second research question.

2. Experiment and perception test on H2

H2 states that the slope in the final complement constituent determines the interrogative sentence. Therefore, the experiment was designed by creating a slope at the constituent. Creating slope was done by lowering pitch 5,42st. After that, the tone point is lowered three times with 1st for each lowering. Next, those stimuli were coded, D2a for the first lowering followed by D2b (the second lowering), D2c (the third lowering), and D2d (the fourth lowering). The contour of those stimuli can be seen below:

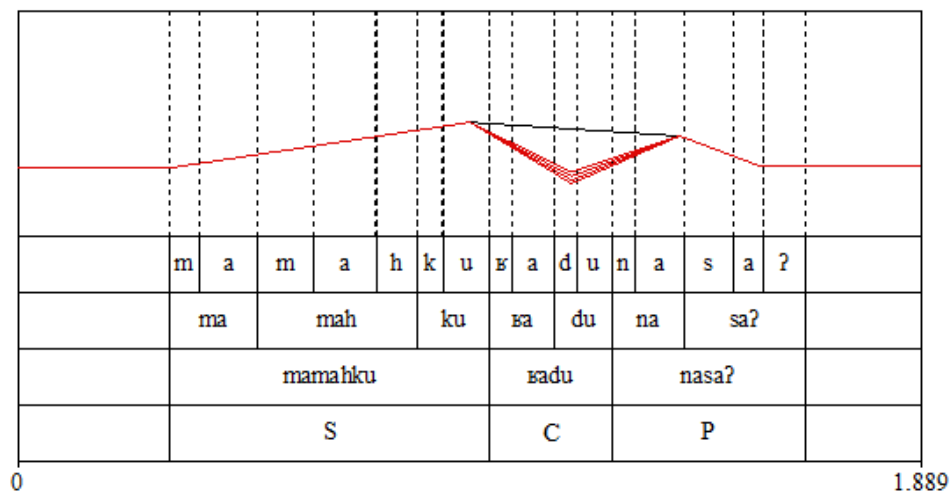


Figure 4. The stimulus of D2a, D2b, D2c. and D2d.

From the perception test, it was obtained the respondents' perceptions as seen in the following table:

Table 3. Assessment of perceptual test on H2

Stimulus	Respond		Acceptability (%)		
	Dec	Int	Dec	Int	Significance as an Interrogative Sentence
Declarative	20	0	100	0	Not significant
D2a	18	2	90	10	Not significant
D2b	18	2	90	10	Not significant
D2c	16	4	80	20	Not significant
D2d	18	2	90	10	Not significant

As seen in Table 3, no significant answer was obtained. This means the slope in contour does not suprasegmentally influence the meaning of the sentence. In other words, H2 is not accepted. Therefore, it is predicted that the slope in the interrogative contour can be removed. The prediction is interesting to be experimentally analyzed in the next study.

Conclusion

This study finds suprasegmental features influencing the meaning of utterances in Lampungnese language. They are pitch, contour, and duration. In the language, an interrogative utterance is suprasegmentally constructed by higher pitch, more complex contour, and longer duration than the declarative one. Besides, the experiment of perceptual test proves that the final constituent of the subject is the prosodic point that significantly influences the meaning and perception. On the other side, the slope does not influence the sentence mode significantly.

Next, the finding mentioned that the Lampungnese intonation contour is different from the general intonation contour as Bolinger (1972) even to Indonesian which comes from the same language family as Lampungnese. This finding implicitly says that the analysis of intonation systems needs to be explored more to find the characteristics of a language intonation. The characteristic will help people to understand each other so communication will occur effectively.

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