ETHNIC FACTORS ON VOCAL DURATION AND FREQUENCY

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ETHNIC FACTORS ON VOCAL DURATION AND FREQUENCY

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ABSTRACT: This study aims to determine the comparison of vocal frequencies between Javanese and Borneo ethnic groups in pronouncing English sentences using Praat software. A total of 18 post-graduate students from Universitas Sebelas Maret were asked to read different sentences in English. Furthermore, the sentence is recorded and analyzed with Praat. SPSS version 22 is used to find out the vocal frequency comparison between Javanese and Borneo ethnic groups for the T-test and ANOVA. The results of this study indicate that only 1 vowel 5.6% of a total of 18 vowels shows a significant difference seen from the ethnic Javanese of Borneo. This result also shows that the frequency of speech of the two ethnic groups is not much different or can be said to be the same.

KEYWORDS; ethnics, duration, vocal frequency

I. INTRODUCTION

As a vast nation, Indonesia has diverse languages from each of its tribes. However, as a unifying language, these tribes will speak in Bahasa. Because of the diversity of these tribes, different prosody and suprasegmental elements in speech also occurred (Arifin, Sumpeno, Hariadi, & Syarif, 2018; Prima, 2019). A good suprasegmental element in speech will create a good interpretation of the speech partner (Aswad et a., 2020). However, improper interpretations will be accepted by the speech partners if the suprasegmental elements produced are not good (Leemann, Kolly, & Dellwo, 2014; Leemann & Kolly, 2015). With different accents, the speakers of each ethnic group have their prosody (Budiharso & Arbain, 2019).

Nowadays there are various researches related to vocal analysis using Praat. In research (Gorris et al., 2019; Weise, Ita, Hirschberg, & Levitan, 2019) related to vocals based on the age and sex marks the importance of using Praat to measure reliability. From the test result, it was concluded that there was no significant relationship between the vocal frequency with sex and age. Furthermore, research conducted by Lovato et al., (2016) is related to the comparison of two applications of Multi-Dimensional Voice Program (MDVP) and Praat in assessing the frequency of gender. The results needed are the differences between the two applications in deducing the frequency of speech. Research (Núñez Batalla et al., 2014; Maryn, Corthals, De Bodt, Van Cauwenberge, & Deliyski, (2009)) showed similar results in the analysis of vocal frequencies by Dr. Speech and Praat application.

Specific research related to frequency and speech acts related to ethnicity has been initiated by (Yustanto, Djatmika, & Sugiyono, 2016; Yustanto & Widyastuti, 2018). The research revealed differences in the vocal frequencies that differed between generations in the Javanese ethnic group. Furthermore, a similar study conducted by (Pranoto, 2018; Syarfina, 2014) showed that there were differences in the vowel frequency of the Batak Malay Batubara seen from its works and the males have smaller vocal frequencies after being tested with Praat. Unlike the previous studies that focus on age, gender, and Javanese ethnicity as the object of research, this research will involve two ethnicities as research objects namely Javanese and non-Javanese, namely Borneo. This study tries to uncover the utterances of the two tribes by looking at the duration and frequency using Praat.

There are 18 simple sentences in English, namely: 1. I wrote a new test, 2. We watched the movie together yesterday, 3. I have ten books, 4. I work every day, 5. We eat fried rice, 6. We study discourse analysis, 7. I drink milk every day 8. We got a difficult task, 9. We read 30 articles journal, 10. We must finish the task next week, 11. We listen to a new theory in discourse analysis, 12. We discuss a semantic theory, 13. We publish our articles in a journal, 14. We finish the class on December, 15. We left the class in the afternoon, 16. We walked to the mosque, 17. We ate in the class, 18. We buy a new book (Arbain, Taufik, Ngoc, & Nur, 2017; Arbain &

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Nur, 2017). Hypothesis in this study is H1 = There is a difference between the vowels spoken by Javanese and Borneo ethnic groups and H0 = There is no difference between the vowels spoken by Javanese and Borneo ethnic groups.

II. METHOD

The research is conducted at Universitas Sebelas Maret Surakarta involving 14 post-graduate students as research subjects. The number is divided from 13 Javanese students and 1 Banjar (Borneo) student. By using an experimental approach, this research is expected to see the impact of manipulation on speech using speech analysis software namely Praat (Pranoto, 2018; Yustanto et al., 2016).

By adopting the IPO approach (*Instituut voor Perceptie Onderzoek*) as an accurate measurement tool with the help of a computer to analyze the speech. The stages carried out in the implementation of this research are; (1) using Praat to record the voice as natural as possible according to the style of the subject. Subjects were asked to record the voice repeatedly to choose the best sound quality. (2) Next, storing the audio document in wav. format and making sure it is clean from noise. (3) After ensuring that the audio document has been safely stored as research data, the document is opened in Praat. To view the text grid file, select the annotation, and then correct the speech data. (4) Then, having a data text file in word format, the data is transferred in Excel format by combining all respondents' documents. The final step is to copy the excel file into the SPSS program to tie the independent t-test and Anova.

III. RESULTS

Ethnic Factors in Speech Frequency

To find out the differences between Javanese and non-Javanese's (Borneo) speech, SPSS version 22 was used with Anova analysis and T-test to get the results of the t-test. Using this software, reliability 0.05 was chosen. 18 vocals from Javanese and non-Javanese (Borneo) were tested for the next stage. From the test results, the second vocal frequency data were obtained which looked significantly different between Javanese and non-Javanese (Borneo) with 0.022, which means that only 5.6% of vocal utterances showed significant differences seen based on the ethnicity of the speakers.

Table 1. Results of the Different Vocal Frequencies between Javanese and non-Javanese

NO	ITEM	SIGNIFICANCE
1	V2	0.022

The data above show that only a small portion of vocals between Javanese and non-Javanese (Borneo) is not significant. Only 1 vowel 5.6% of a total of 18 vowels showed a significant difference seen from Javanese and non-Javanese (Borneo). With these results, it can be concluded that there is no difference in vocal frequency between the two ethnic groups namely Java and Borneo. The following is complete data which presents a comparison of the vocal frequencies between the ethnic groups.

Table 2. Variations in vocal frequency between Javanese and Borneo ethnic groups

NO	Javanese	Non-Javanese (Borneo)
V1	8455.0702	9525.8112
V2	8923.4737	11617.1608
V3	9061.7719	10482.7692
V4	10496.8158	10916.5035
V5	10951.5702	12009.2378
V6	12161.9298	11166.2238
V7	11781.7281	11106.4476
V8	11515.5175	11391.6084
V9	11483.4035	11336.8671
V10	11241.6667	11594.3636
V11	11775.7281	11605.7133
V12	10558.9211	11131.3077
V13	10841.5526	11432.1399
V14	10705.1842	11680.4266

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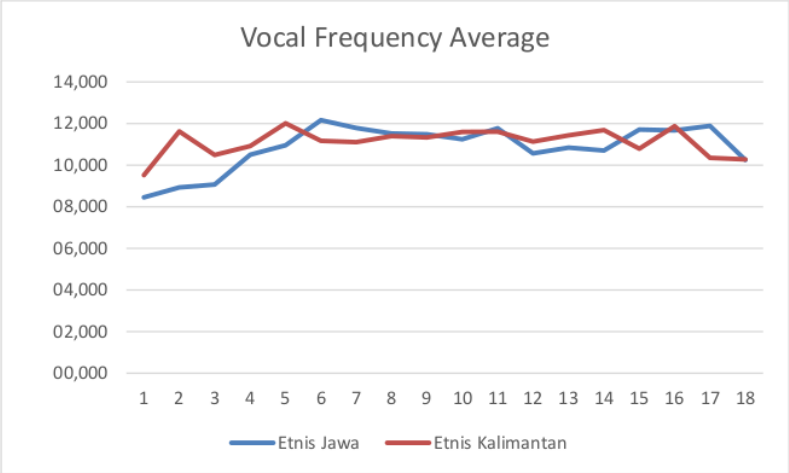
V15	11706.6053	10784.1399
V16	11668.0877	11868.5944
V17	11884.8772	10346.9650
V18	10245.3158	10268.4615

The majority of data for each speaker of the two ethnicities is not much different proved from the vocal data between the ethnic groups, both from Javanese and Borneo. In Javanese speakers data, from data V4 to V18 show different frequency similarities. Whereas in the V1 to V3 data, differences in vocal frequencies exist. Different from the data on Javanese ethnicity, the vocal frequencies in the Banjar ethnic group almost show similarity that can be seen in data V2 up to V18 showing the similarity of vocal frequencies. The difference only occurred on vocal frequency data V1. The similarities in vocal frequencies in the two ethnicities are depicted in the following graph.

Graph 1. Average vocal frequencies between Javanese and Non-Javanese (Borneo)



The above findings conclude that only 5.6% or 1 data from a total of 18 vocal frequencies show the differences between two ethnic groups namely Javanese and Non-Javanese (Borneo). Vice versa to the level of similarity in the two ethnicities which shows the level of similarity at 94.4%. Thus, there is no difference in vocal frequency between Javanese and Borneo tribes. These results can indicate there is no relationship between vocal frequency between Javanese and Non-Javanese (Borneo) which means H1 is rejected and Ho is accepted.

Ethnic factors of Javanese and Borneo dialects in English vowels

The first ethnicity or language background tested were speakers from Javanese, Sundanese, Batakak, Madurese, and Malay ethnic groups. The Malay mentioned here does not refer to their ethnicity but to the language, they have as their first language, those from West Sumatra and Borneo. To determine the significance of this first language background (B1), an ANOVA test was conducted which includes a homogeneity test and a post-hoc test (Benferroni and Games-Howell), with a confidence level of 0.05. After inputting data and processing, the results are as shown in Table

No	Item	Significance	
		ANOVA	Homogenity
1.	V1	0.630	0.001
2.	V2	0.135	0.133
3.	V3	0.238	0.482
4.	V4	0.294	0.328
5.	V5	0.000	0.212
6.	V6	0.533	0.001
7.	V7	0.055	0.047
8.	V8	0.346	0.036

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9.	V9	0.000	0.000
10.	V10	0.233	0.447
11.	V11	0.589	0.925
12.	V12	0.001	0.041
13.	V13	0.483	0.398
14.	V14	0.000	0.006
15.	V15	0.683	0.642
16.	V16	0.106	0.026
17.	V17	0.045	0.023
18.	V18	0.000	0.034

Table 3 only shows vowel sounds whose frequency is significantly different. Of the total 18 vowels used as test material, 9 vowels are pronounced differently, the rest tend to be the same evidenced by the significance number below 0.05 as its parameter. Then the items are reflected by a homogeneity test to determine the significance of the difference of each item being compared; the difference in the pronunciation of speakers with which B1 and which one shows a significant frequency. Because they are proven to be homogeneous, as shown in the table, the reference for reading post-hoc test results is the Benferroni test, with the following results (Table 4).

No	Item	**First Language**	Surabaya	Banjar	Solo
1	V5	Lampung	049		
		Banyumas	013		
		Surabaya		009	
2	V9	Banyumas			004
		Banjar			000
		Surabaya		020	
3	V12	Banyumas			014
		Banyumas	011		
4	V14	Lampung			018
		Banyumas			029
		Banjar			000
		Surabaya		005	
5	V17	Banyumas	032		
6	V18	Banyumas			014
		Banjar			019
		Banyumas	000		
		Banjar	000		

According to the table, it appears that speakers of B1 Banyumas and Solo have different vocal frequency characters than others. Both groups of speakers differ from other speakers in 6 vowels out of a total of 18 vowels of the sentence being tested. This means that more than 33% of their speech is different from one of the four B1. This means that native speakers of Sundanese and Solo have different ways of speaking with the 3 groups (Banjar, Surabaya, and Lampung) of other B1 speakers. These results certainly cannot be used as a benchmark and deeper research using other pronunciation parameters is needed.

IV. CONCLUSION

The conclusion in this study showed no significant difference in vocal frequency between Javanese and Borneo ethnic groups. This is evidenced by the t-test on the two tribes which shows only one speaker who has a different vocal frequency. These results show 5.6% or 1 data from a total of 18 vocal frequencies that show differences between the two ethnic groups namely Javanese and Non-Javanese (Borneo). Furthermore, in the ANOVA test, 6 different results were obtained in V5, V9, V12, V14, V17, V18 consist of Javanese Banyumasan, Solo, Surabaya, and Lampung dialects. The compared tribe chosen is a tribe originating from Borneo, the Banjar ethnic group.

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