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Formant Analysis in Native and Non-Native Speakers

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ABSTRACT

This research wants to find out how the voice formants of people who speak English as their first language differ from the voices of people who speak English as a second language. This research uses a computer program called Praat to help with the research. The people to be studied are those who grew up speaking English and those who learned it later in life. The samples in this research were taken 1 male voice and 1 female voice non-native speaker and 2 native speaker voice sample Male and Female. The findings of the analysis show that there are not many differences between native and non-native speakers' pronunciations of each monophthong, especially when they relate to the monophthong /ə/, which is difficult for non-native speakers to pronounce correctly.

Keywords: *native, non native, formant, monopthong*

INTRODUCTON

English is an international language that has demonstrated its existence in the world, as interest in English continues to grow, it is evident from the many organizations or media that provide facilities for learning English, making it easier to communicate with each other. Communication is how we share information. When we talk to each other and see each other's faces, it is a special kind of communication that is very valuable. When we speak and show our emotions with our faces, it helps the other person understand not just what we are saying, but also how we feel. When we listen to someone, we not only hear what they are saying but also how they are saying it. Language is a way for people to communicate and understand each other. It helps us express our thoughts and feelings and allows us to be part of a group. Languag is created by the people who speak it, and it changes as society Changes.

Perception of speech contrasts that differ from the listener's native language phonologically and/or phonetically is systematically limited by linguistic experience. Although these impacts start to show in infancy and continue to grow through at least early childhood, they are most noticeable in adulthood. This study focuses on the following main question: What impact do findings on nonnative speech perception have on the phonetic and phonological facets of second language (L2) perceptual learning? One common idea is that the relative problems late learners face with particular L2 segments and contrasts can also be explained by nonnative speech perception. Nevertheless, assessment of this supposition has to consider that nonnative speech perception models, such the Perceptual Assimilation Model (PAM), have predominantly concentrated on unsophisticated listeners, while models of

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Language is influenced by the situation we are in, the culture we belong to, and the ideas we believe in. It shows who we are as a community.

Humans have skills to receive and process information around them. One of which is can recognize people just from their voices what he heard. Because of each voice People have different characteristics. Phonology is a branch of linguistics which studies about the sound system of a particular language or language while phonetics is science that studies production physical and perception of speech sounds. David Odden expressed "Phonology is one of the center areas that compose the discipline of linguistics." (2005: 38) Agreeing to theory Odden the phonology is one the center range comprising of rules linguistics. Azhar (2001) expressed that on In guideline, discourse sounds comprise of: several components, to be specific pitch, formant and usable spectrograms to recognize characteristics someone for the purpose of voice recognition. In this case, this research will Analyze formant differences between native and non-native speakers using PRAAT software.

METHOD

This research uses the method experimental. Latipun (2002:114) suggests that research Experiments are research done by manipulation which aims to find out the consequences manipulation of individual behavior that was observed. Experimental research on the principle can be defined as a systematic method for building relationships that contain phenomena cause and effect (causal-effect relationship) (Sukardi 2011:179). This research uses instrumental approach, namely using a computer with program application Praat (Silalahi, 2007:14). Approach instrumental provides solutions on the limitations of the approach impressionistic. On approach impressionistic sensibility and craftsmanship reliable in identification language sounds, while approach Instrumental is done with help an accurate measuring tool in the form of a program Praat.

Subject and Materials

Two local Indonesian speakers took this test. The main speaker (RE) was a 24 year old woman born in Labusel (North Sumatra). Indonesian is her first language (L1), she also speaks Indonesian and English. The second speaker (AM) was a 27 year old man born in Labusel (North Sumatra). His first language is Indonesian, and he also speaks Indonesian and English. The two speakers keep up day-by-day communication in Indonesian inside the family. The material were 12 monofthongs /æ/,/ɛ/, /ɑ/, /ʊ/,/ɑ/,/ʌ/,/ɜ/,ˈ/ə/,ˈ/i/,/ɪ/,/u/,/ʊ/ will be measured using the Pratt application

RIVIEW OF LITERATURE

Yates and Zielinski state that articulation alludes to how we create the sounds that we use to form meaning when we talk. It incorporates the specific consonants and vowels of a language (portions), angles of discourse past the level of the person fragments, such as stress, timing, beat, pitch, stating, (supra-segmental angles), and

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how the voice is projected (voice quality). Monophthongs are pure vowels that don't ought to alter the speech organ position through the vowels verbalization term. Unadulterated vowels are shaped by the development of the tongue position within the mouth because it is classified into a single seen sound-related quality. Formant estimation is an obsolete adaptation of PRAAT 6.2.14 (Boersma and Weenink, 2022). The primary formants (F1) and moments (F2) are measured to determine vocal quality. Both designs can be used to determine vocal quality in the F2/F1 vocal space. Indeed, even though vocal quality can be conveyed by many formats, the first two formants are quite satisfying to talk about vocal quality in the vocal space. If F1 is comparable between two vowels, then they should have varying F2 values to be considered a typical vowel (Beňuš, 2021). Beginning and vocal offsets are determined by physically reviewing the vocal waveform and target spectrogram

IPA	POSITION					LENGTH		TENSE NESS		ROUND NESS	
	Back	Front	Mid	High	Low	Short	Long	Lax	Tense	Rounded	unrounded
/iː/		✔		✔			✔		✔		✔
/i/		✔		✔		✔		✔			✔
/uː/	✔			✔			✔		✔	✔	
/ʊ/	✔			✔		✔		✔		✔	
/æ/		✔			✔	✔	✔	✔			✔
/e/		✔	✔			✔		✔			✔
/aː/	✔				✔		✔	✔		✔	
/ʌ/			✔			✔		✔			✔
/ɜː/	✔				✔		✔	✔		✔	
/ə/			✔			✔		✔			✔
/ɒ/			✔	✔		✔		✔		✔	
/ɔː/	✔				✔		✔		✔	✔	

http://englishspeaklikenative.com/resources/vowels-matrix/

1. RESULT AND DISCUSSION

Research that focuses on monopthong is a vowel sound pronounced as a single, unchanging sound, without any significant change in quality or length. In other words, it is a single vowel sound that remains constant throughout its pronunciation. In contrast, diphthongs are vowel sounds that involve a gradual change in quality and length, such as the "oi" sound in "boil" or the "au" sound in "caught". Monophthongs are an important element of the English language, and their use can affect the way words are pronounced and understood. To see the difference in pronunciation between native and native speakers, researchers have measured f1-f4 from two native speakers and non-native speakers

Table 1. Female Formant Native Speaker

Native speaker Female	Fat /æ/	Bes t (e)	Box (ɒ)	Sure (ɔː)	Dark (ɑː)	Fun (ʌ)	Girl (ɜː)	Cinema (ə)	Freezer /iː/	Big /I/	Shoes /uː/	Cook /ʊ/
F1	1063	1092	1099	1960	1010	1083	1282	943	804	914	2221	1036
F2	1800	1953	1492	3016	1420	1525	1761	1875	2382	2218	2972	1541

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F3	2665	2493	2840	3692	2302	2349	3009	2394	2575	2268	3943	2639
F4	3442	3204	3175	4681	3563	3889	4800	3196	3776	3444	4506	4108

Table 2. Male Formant Native Speaker

Native speaker Male	Fat /æ/	Best (e)	Box /ɒ/	Sure /ɔ:/	Dark /ɑ:/	Fu n /ʌ/	Girl /ɜ:/	Cinema (ə)	Freezer /i:/	Big /I/	Shoes /u:/	Cook /ʊ/
F1	1054	1089	2001	1194	1015	1090	1249	956	794	921	2198	1051
F2	1798	1940	1502	3000	1419	1530	1780	1863	2295	2198	2999	1607
F3	2658	2555	2829	3599	2310	2299	3025	2377	2521	2232	3989	2601
F4	3440	3378	3190	4680	3520	3878	4811	3187	3792	3540	4532	3985

Table 3. Male formant Non-native Speaker

male speaker non-native	Fat (ae)	Best (e)	Box (ɒ)	Sure (ɔ:)	Dark (ɑ:)	Fun (ʌ)	Girl (ɜ:)	Cinema (ə)	Freezer /i:/	Big /I/	Shoes /u:/	Cook /ʊ/
F1	1523	1793	1789	1780	1131	1356	1200	981	1850	1799	1539	1996
F2	2683	2529	2363	2800	1526	1992	2196	1911	2921	2751	2500	2341
F3	2782	3595	3336	3507	2552	3544	3526	3079	3627	2966	3553	3485
F4	3822	4407	3980	4999	3968	4322	3588	3734	4306	3646	3701	3914

Table 4. Female Formant Non-native Speaker

female speaker non	Fat (ae)	Best (e)	Bo x (ɒ)	Sure (ɔ:)	Dark (ɑ:)	Fun (ʌ)	Girl (ɜ:)	Cinema (ə)	Freezer /i:/	Big /I/	Shoes /u:/	Cook /ʊ/
F1	1901	1009	1250	1239	1153	1277	1245	960	1106	1378	1263	1105
F2	2094	2084	1627	2554	1441	1904	1950	2051	2758	2612	3134	1852
F3	2738	3220	2836	2906	3085	2717	2962	2875	3491	2948	3748	3123
F4	4119	4262	4143	4151	3790	3356	3904	4269	4485	3511	4224	4294

Based on the research findings, there are several monophthongs that are successfully pronounced by non-native speakers, namely monophthongs,/ɛ/,/ɑ/,/ʊ/,/ɑ/,/ʌ/,/ə/,ˈ/i/,/ɪ/,/ʊ/, Of the 9 monophthongs that were successfully produced well by non-native speakers, monophthongs /ə/ became

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monophthongs that had excellent pronunciation. From the table above, the native f1 range is 943-956, not much different from non-native speakers who have f1 960-981. and the mispronunciations are /æ/,/ɜ:/,/u:/.

The monophthong /æ/ changes to /e/, for example in the word Fat [fæt] becomes [fet]. The monopthong changes /ɜ:/ to /e/, for example in the word girl [gɜ:rl] becomes [gerl]. monophthongs change /u:/ to /u/ for example the word shoes [ʃu:z] becomes [ʃuz].

this proves that native speakers and foreign speakers have several differences in pronouncing English, especially monophthong sounds. Of course, pronunciation is absolutely influenced by the speaker's own mother tongue, however, with a lot of practice and study it is likely that the gap between native and non-native speakers will be minimized. when learning a new language, L2 learners tend to filter the sounds of the target language through their language existing sounds (Alispahic et al., 2017; Best & Tyler, 2007), and thus, the production of non-native sounds, at least in the early stages of development, may resemble. some sounds The original vocals are there. This research found that English vowel monopthong production is to some extent, related to how Indonesian vocals are produced. In other words, the quality of some English vowels may be similar to that of Indonesian vocals, especially for vocals that have similar qualities to the original vocals.

in this study which focused more on the comparison of formant pronunciation between native and native speakers, but the surprising fact was that the researchers found that non- native speakers were almost completely able to pronounce monopthong vowels well, this proves that as time goes by, attention to second language mastery, especially English, is increasing. request, and the factors that can support this growth are based on the participants in this research, namely growing up in an environment that develops their language skills, and learning it autodidactically through online media.

CONCLUSSION

The results of this study showed that non-native speakers could produce the monophthongs /ɛ/, /ɑ/, /ï/, /ɑ/, /ʊ/, /ə/,ˈ/i/, /ɪ/, /ï/ and sounding like native speakers. This suggests that non-native speakers can produce these nine monophthongs well, but they have trouble pronouncing the other three, /ae/,/ ɜ:/, and /u:/.This research found that English vowel production is, to to some extent, related to how Indonesian vocals are produced. In other words, the quality of some English vowels may be similar to that of Indonesian vocals, especially for vocals that have similar qualities to the original vocals. This research still has many shortcomings, this research only discusses the differences in formant size between native and non-native speakers. In the future, it is hoped that there will be many new findings that discuss monophthongs as measured by formants through the praat application in more detail.

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