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CHARACTERISTICS OF PRONUNCIATION SEGMENTATION OF ALVEODENTAL PHONEME [tˤ] IN STUDENT READING TEST

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Abstract

This study examines the segmentation and pronunciation accuracy of the alveodental phoneme thāʾ [tˤ] in Arabic based on students' reading tests. By employing a qualitative descriptive method with a content analysis design, the research seeks to obtain detailed descriptive data in the form of words and images. The Praat application is used to measure sound frequency from various sound sources, ensuring precise and comprehensive analysis. The results indicate that students face significant challenges in correctly pronouncing the phoneme [tˤ], with frequent articulation errors. These pronunciation difficulties are attributed to several factors, including the phonetic differences between the students' native languages and Arabic, the inherent complexity of Arabic phonemes, and the influence of various dialects or accents the students may possess. This study highlights the critical need for a thorough understanding of phoneme properties and emphasizes the importance of consistent practice to improve pronunciation accuracy of [tˤ]. By addressing these issues, educators can better support students in mastering Arabic pronunciation, ultimately enhancing their overall language proficiency. The findings of this research contribute to the broader field of phonetics and language education, offering valuable insights for language teachers and learners alike.

Keywords: *Arabic; alveodental consonants; praat; phoneme [tˤ]*

1. Introduction

Segmental phonemes serve as indicators that the sounds in a language follow a specific sequence based on their nature and manner of articulation. In Arabic, phonemes are divided into two categories: vocoid and contoid sounds. One notable contoid sound is the phoneme [tˤ], which possesses four distinct properties: (1) it is voiceless, (2) it features a restrained sound flow (stop), (3) it involves a retracted tongue root, and (4) the sound direction is upward due to the retracted tongue root (Pansuri et al., 2022). The phoneme [tˤ] stands out in Arabic due to its unique phonetic and phonological characteristics.

In Arabic, the phoneme [tˤ] can have different semantic implications compared to the phoneme [t]. A substitution of [tˤ] with [t] can significantly alter a word's meaning, underscoring the importance of accurate pronunciation in the language. The correct use and articulation of these phonemes are crucial, particularly in teaching Arabic to non-native speakers. The phoneme [tˤ] is characterized by the elevation of the back of the tongue

during articulation, producing a thick or emphatic sound (Al Tamimi, 2015). It also belongs to the category of plosives or explosive consonants, which involve stopping the airflow momentarily before releasing it.

Researchers reference two key studies to support their investigation. Jamil (2018) highlights the different sound systems in Arabic phonemes, noting that these differences can lead Arabic learners to misarticulate phoneme sounds. Nasaruddin (2017) discusses phonological interference in the speech of Arabic speakers when speaking Indonesian, pointing out sound changes found in Indonesian. These studies underscore the complexity of Arabic phonemes and the challenges they present to learners.

Given the unique nature of the phoneme [tˤ] and its significance in the Arabic language, researchers are particularly interested in studying this phoneme. Understanding its properties and articulation is essential for improving pronunciation accuracy and teaching effectiveness in Arabic language education.

2. Literature Review

A diagram of previous research, created using the Google Scholar Publish or Perish application, illustrates the volume of Arabic research over the past ten years. The graph visually represents trends and patterns in research activity, highlighting areas of increasing scholarly interest and the evolution of academic focus during this period. This analysis is instrumental in identifying gaps in the literature and understanding the trajectory of research developments in the field.

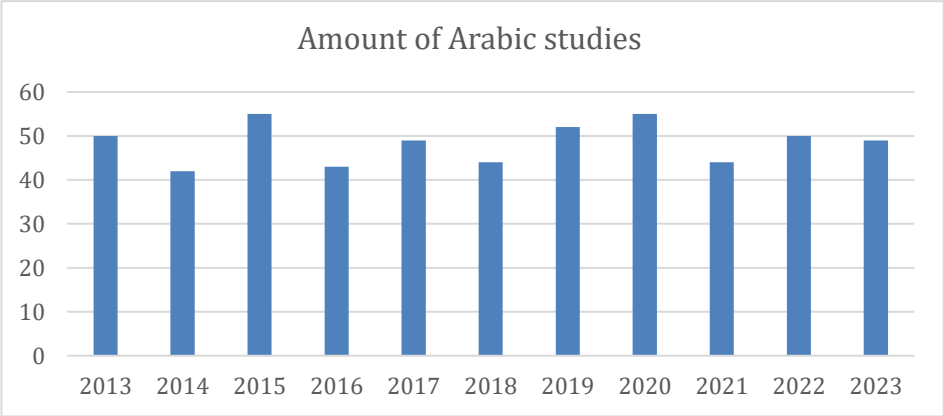

Diagram 1. Diagram publish or perish Arabic research 2013-2023

Based on the data obtained from Publish or Perish, there have been 533 studies on Arabic consonants conducted between 2013 and 2023, as illustrated in Diagram 1. Notably, research on Arabic consonants saw a significant increase from 2018 to 2020. This trend has piqued the researchers' interest in further exploring this topic.

There are at least three highly relevant studies in the field.

1. **Purwandari (2022)** - In her article titled "Analysis of Phonological Interference in Tasyji'ul Lughah Activities of Santri of Al-Kamal Islamic Boarding School," she explores the internal factors originating from students and external factors from coaches that lead to phonological interference. The results indicate changes in pronunciation for each consonant.
2. **Nasaruddin (2017)** - His study, "Arabic Phonetic Interference in Indonesian: Analysis of Indonesian Speech by Arabic Speakers," identifies two forms of interference: changes in

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the pronunciation of Indonesian sounds unfamiliar to Arabic and changes influenced by Arabic sounds.

3. **Jamil (2018)** - The research, "Frequency of Arabic Speech Modes by Arabic Language Learners at Al Washliyah University Medan: An Experimental Phonetic Study," concludes that differences in sound systems cause Arabic learners to mispronounce sounds at incorrect points of articulation.
4. **Mutiara (2018)** - In "Comparison of Arabic and Javanese Sounds (Contrastive Analysis)," the study finds both differences and similarities in the sounds of Arabic and Javanese, highlighting specific sound similarities.
5. **Ala and Qutni (2019)** - Their research, "Phonological and Grammatical Interference of Class VII Students of MTs N 1 Kudus in Arabic Language Learning (Sociolinguistic Study)," reveals phonological and grammatical interference in student speech, based on data from recordings, observations, and notes.

Furthermore, the researchers would focus on the phonemes located in the alveodental with the aim of examining how precise the pronunciation is pronounced by students and is devoted to the phoneme [tˁ], as well as analyzing errors and difficulties in pronunciation in Arabic consonants, especially in the phoneme [tˁ].

3. Research Method

This study adopted a qualitative descriptive research method to explore and interpret data findings. The research design applied was content analysis, chosen to analyze verbal data in the form of student speech during the reading of Arabic texts. Content analysis was also used to identify and describe the types of phonological errors that emerged when students read Arabic texts. To collect data, the researchers used voice recordings of student speech. The focus was on the segmentation of phoneme pronunciation in labiodental Arabic, specifically the phoneme [tˁ], among Arabic learners in Indonesia. A descriptive approach was essential to explain the sampling research results.

The study was conducted at Pondok Pesantren Sabilun Najah with a total of 4 student participants representing a sample of the high school class population, as depicted in Table 1. The sources of speech sound documents were Student A, Class X (SA-X), Student B, Class XI (SB-XI), Student C, Class XII (SC-XII), and Student D, Class XII (SD-XII). The primary data source was a test of students' pronunciation through the reading of Arabic texts. The data consisted of spontaneous speech in everyday contexts, which the researchers then examined using a phonological approach.

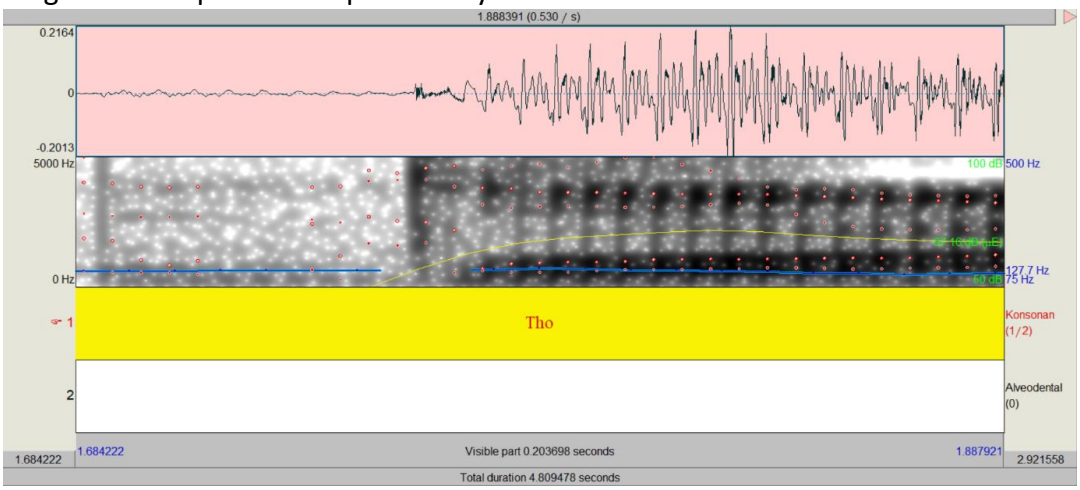
Indicators	Descriptions
Gender	Men
The number of students	4 Students
Grade level	SA-X SB-XI SCD-XII

Table 1. Characteristics of participants

The data collection technique used was a document study. Data were presented through narrative descriptions, charts, category relationships, and flowcharts. The processed data were then presented in the form of an integrated description. The author used the Praat application to obtain better results in analyzing the data. The Praat application measured the frequency of sound from a sound source. After obtaining a sound recording, Praat dissected the sound into a detailed spectrogram and produced more detailed individual parts of the sound.

4. Results and Discussion

After the data are collected, the next step is to process it using the Praat application. This process begins with inputting the recorded data into Praat and then segmenting the recordings according to each phoneme. This segmentation is crucial for analyzing the accuracy and nuances of pronunciation among Arabic language learners. The segmented results are then compared between the students and native speakers, as depicted in Spectrogram 1. This comparison aims to discern differences in pronunciation patterns and identify areas where learners may encounter challenges or exhibit strengths compared to native speakers. By examining these differences, the study seeks to provide insights into the phonological development and proficiency levels of Arabic learners in an Indonesian context.



Spectogram 1. Native speaker Segmentation of the phoneme [tˁ]

Based on the results of the analysis of the segmentation image, it can be concluded that the pronunciation of the phoneme [tˁ] by native speakers fully meets all aspects of the properties contained in it. This occurs without the intervention of the phoneme ʿ*ā*[ʕ] that follows after it, as in the example of the word *Thā*ʾʿ*ām*. The phoneme [tˁ] has five phonemic properties that include: (1) Clear (voiceless); (2) sound flow is restrained (stop); (3) the direction of the sound up (retracted tongue root); (4) the sound stops (retracted tongue root) (Al Rasyid, 2009). If all five aspects of the properties of the phoneme are met, then the pronunciation of the phoneme [tˁ] is considered perfect.

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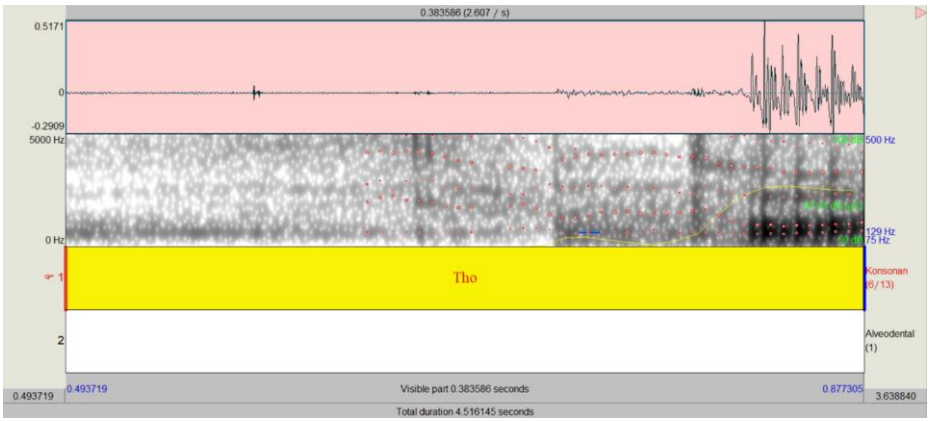
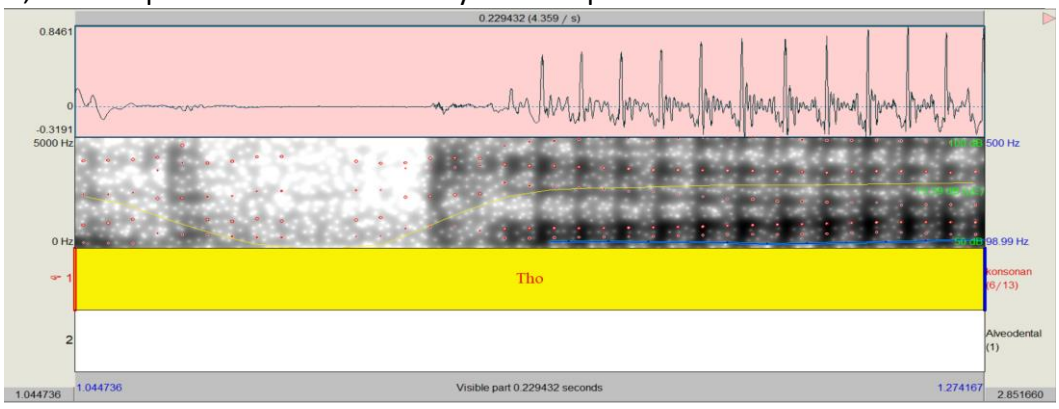


Spectogram 2. Segmentation of the phoneme [tˤ] by SA-X

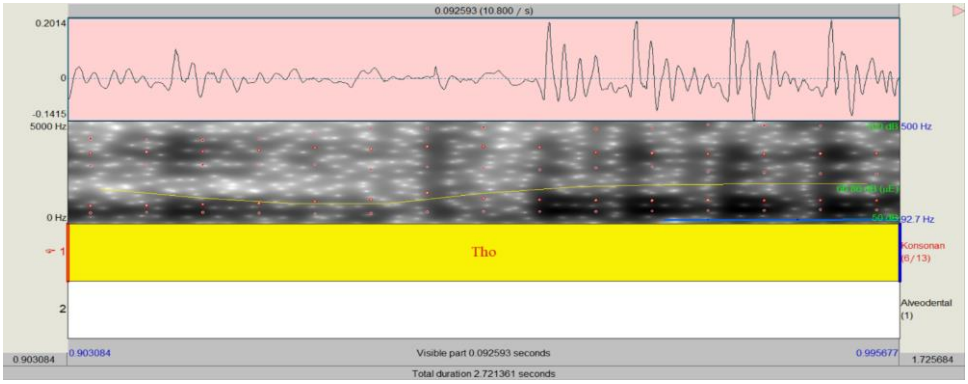
The pronunciation of the phoneme [tˤ] in Participant One tends to be by the phoneme [ʕ] because the phoneme after it is [ʕ]. [tˤ] side by side with [ʕ] in the sentence *Thāʾʿām*, then the phoneme tho pronounced is also weak, resulting in a faint phoneme and tends to be more similar to the phonem [t]. As mentioned by Marlina in her book Introduction *To The Science of Ashwat*, the difference between [t] and [tˤ] in Arabic is a phonemic difference that will cause differences in meaning (Marlina, 2019). The word *Thāʾʿām* has the meaning of food, so when there is a change in pronunciation from the phoneme [tˤ] to the phoneme [t], then the word becomes meaningless. The accuracy of pronunciation is important because it can affect the meaning intended by the reciter (Sholihin, 2020). Then, the direction of the sound produced is sloping or downward, which should be the direction of the sound upwards (retracted tongue root). When pronouncing istifal, the character is made to sound low, thin, and light by spreading the tongue to create space between the palate and the tongue (Maulani, 2023). Furthermore, if viewed from the flow of breath phoneme [tˤ] into the category of clear (voiceless), there is no flow of breath, and pronunciation is in accordance with the nature of clear (voiceless). The last trait is the sound of stopping (retracted tongue root). That is, the sound that is spoken is thicker and heavier, and the pronunciation does not yet correspond to this trait.



Spectogram 3. Segmentation of the phoneme [tˤ] by SB-XI

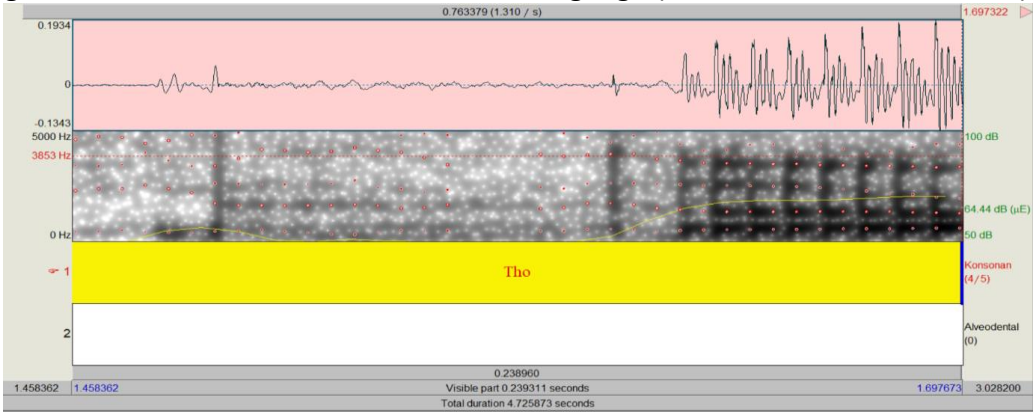
The pronunciation of the phoneme [tˤ] by the second participant is clearer and is not affected by the following phoneme. When a phoneme is pronounced distinctly, it produces an accurate meaning that differentiates it from other meanings (Nasution, 2017). The phoneme [tˤ] pronounced is also by the nature of the sound flow that is firmly closed so that

it produces a clear phoneme, then the direction of the sound is the direction of the sound upwards (retracted tongue root) or directed upwards. Then, when viewed from the nature of the clear (voiceless), the phoneme is pronounced less closed in the flow of breath, then in terms of the thickness of the phoneme, the sound stopped (retracted tongue root), then less thick. As explained by (Huddin et al,. 2022) regarding the properties of the phoneme [tˤ], there is some coherence in the waveform of the spectrogram. Accuracy in phoneme pronunciation has several factors including understanding the phonemes that are pronounced and attention to phoneme pronunciation (Purwandari, 2022)



Spectogram 4. Segmentation of the phoneme [tˤ] by SC-XII

The pronunciation of the phoneme [tˤ] in the third participant tends to have [ʕ] and harakat phonemes that are pronounced tend to be vaguer; the vagueness of the phoneme and harakat that are pronounced will affect the meaning of the word that is pronounced (Amrullah, 2016). There are several consonances like the phoneme, namely in the direction of the sound upwards (retracted tongue root) when the teeth and the tip of the tongue are closed properly, it will produce a sound direction corresponding to the phoneme [tˤ] (Jannah, 2019), and the flow of sound is restrained (stop) and clear (voiceless). The correct pronunciation of phonemes can produce the right meaning of words (Muliastuti, 2014). However, one trait that escapes is the retracted tongue root, the lack of thick pronunciation in the phoneme [tˤ] (Hari, 2021). Therefore, the sound waves produced correspond to the properties of the existing phonemes. In learning Arabic, pronunciation errors occur in many difficult phonemes, one of which is the phoneme [tˤ] (Lathifah, 2017). Errors in the pronunciation of phonemes are made by the learner when he uses the second language he is learning, and those errors have links to his first language (Derakhshan & Karimi, 2015).



Spectogram 5. Segmentation of the phoneme [tˤ] by SD-XII

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The pronunciation of the phoneme [tˁ] in the fourth participant showed two consonances in two properties. Namely, the sound flow was stopped (stop) and clear (voiceless) (Pansuri et al., 2022). The pronunciation's accuracy will affect the listener's meaning (Mailani et al., 2022). However, there are changes in some properties that should be, such as the direction of the sound up (retracted tongue root), which should produce a sound up, but in this case, the direction of the sound that should go up turns down. In addition, the nature of the sound stops (retracted tongue root), which should indicate that the phoneme is read in bold, but in this pronunciation, it is read in thin. Differences in Arabic characteristics are one of the causes of errors in reading texts (Sari, 2016)

Phoneme pronunciation characteristics [tˁ] students in reading students have similarities in some properties. The first participant had two matches, like the pronounced phoneme, namely, the sound flow restrained (stop) and precise (voiceless), although the sound flow restrained (stop)is not too strong. There is a discrepancy in the other two properties, like the direction of the sound up (retracted tongue root) and the sound stops (retracted tongue root). However, the phoneme is pronounced with the direction of the sound down, and a less thick phoneme is pronounced; when compared with the native, there are two differences: the direction of the sound up (retracted tongue root) and the sound stops (retracted tongue root). The second participant is almost perfect in all the properties of phonemes. However, there is a slight deficiency, such as the clarity (voiceless) and little flow of breath. The sound stopped (retracted tongue root) was less thick in pronunciation. The second participant had a slight deficiency in the pronunciation pronounced by the native, like the clear (voiceless) and the sound stopped (retracted tongue root). The third participant has phonemic properties that are almost perfect in all properties except the clear (voiceless) that there is a slight outflow of breath flow that should be perfectly closed breath flow due to the tightness of the vocal cords (Nasution, 2012) in the third participant has a slight deficiency compared to pronunciation pronounced by native except like the clear (voiceless) only. In the fourth participant, there is conformity to the two properties of sound flow: restrained (stop) and clear (voiceless). However, there is an error in the direction of the sound up (retracted tongue root). The sound stops (retracted tongue root) in the direction of the sound down and the flow of sound flow, in the fourth participant has a slight deficiency compared to the pronunciation pronounced by natives except for the direction of the sound up (retracted tongue root) and the sound stops (retracted tongue root). Several factors cause errors in pronunciation, namely a lack of practice in pronouncing the phoneme and a lack of understanding of the properties of the pronounced phoneme.

5. Conclusion

The phoneme [tˁ] possesses distinctive characteristics that are intrinsic to the Arabic language. Pronouncing this phoneme correctly is challenging, and phonological errors often lead to a loss of meaning. These errors can stem from various factors, including phonetic differences between the speaker's native language and Arabic, as well as the influence of particular dialects or accents. A deep understanding of the phoneme's properties and consistent pronunciation practice are essential for minimizing errors in speaking Arabic. Continued research and advancements in technology offer promising avenues for improving the pronunciation of the phoneme [tˁ]. Tools like the Praat application can provide precise analysis and feedback, aiding learners in mastering the correct articulation. By leveraging

such resources, educators and learners can work towards more accurate and effective pronunciation, ultimately enhancing communication and understanding in Arabic.

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