Pronunciation Patterns and Challenges of the Japanese Long Vowel (*Chouon)* /ei/ Among Indonesian Students

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Info Artikel

Abstract

This study examines the pronunciation patterns of the Japanese vowel sequence /ei/ among 62 students from six universities across six provinces in Indonesia. In Japanese, the vowel sequence /ei/ is commonly neutralized to /e:/. According to Takayama (1992), this neutralization is incomplete in formal or careful speech, where /ei/ is pronounced distinctly as /ei/. Hashimoto (2006) observed that speakers alternate between /ei/ and /e:/, particularly at the ends of sentences. This research aims to explore how Indonesian students, who typically pronounce words according to their written forms, produce the vowel sequence /ei/ in both initial and final positions of familiar Japanese words. This study was conducted between January to June 2024. Participants were tasked with identifying instances where native Japanese speakers used the long vowel /ei/ in sentences. They then recorded their own pronunciations of these words in various positions. The recordings were analyzed using PRAAT software. Results show that native Japanese speakers typically pronounce /ei/ as a long /e:/ with an average duration of 0.173 seconds. In comparison, Indonesian learners pronounced /ei/ in "reizouko" with an average duration of 0.204 seconds and in "yotei" with 0.148 seconds, indicating a tendency for longer pronunciation at the beginning of words. The longest recorded duration was 0.49 seconds, and the shortest was 0.04 seconds, possibly due to hesitation. Furthermore, learners tended to simplify the /ei/ sound, especially at the start or end of sentences. This study highlights the need for targeted pronunciation instruction and additional practice time in Japanese language curricula to address these specific phonetic challenges.

INTRODUCTION

In phonetics, vowels are the sounds that can flow freely from the mouth without any obstruction from the vocal organs, produced solely by vibrations of the vocal cords. Japanese phonetics encompasses a mere five vowel phonemes according to research by (Tao, 2023). In contrast to languages such as Chinese and English, the small set of vowel sounds Japanese employs greatly simplifies pronunciation mastery for learners, as noted by (Yazawa et al., 2023).

The Japanese language is characterized by a unique phonetic system, encompassing distinct consonant and vowel sounds, various dialectal variations, and specific pitch patterns, all of which contribute to Japan's rich linguistic diversity (Aibonotika et al., 2023). Second language (L2) speech production is influenced by the phonology of the speaker's first language (L1), often resulting in adult L2 learners producing speech that differs from native speakers (Ota et al., 2018). However, L2 learners may approximate native-like pronunciations through the formation and modification of phonetic and/or phonological categories, a process that remains possible throughout their lifetime (Kondo, 2022).

The models, however, do not fully concur on the likelihood and extent of such changes. The Speech Learning Model (SLM) and its revised version (SLM-r) posit that the perceived phonetic dissimilarity between L1 and L2 sounds predicts category formation and native likeness(Yazawa et al., 2023). 'Dissimilar' L2 sounds, which are perceptually distinct from L1 sounds, are likely to form new categories and achieve native-like pronunciation(Albin, 2015). In contrast, 'similar' L2 sounds are subject to equivalence classification and tend to remain non-native-like. The Perceptual Assimilation Model (PAM) and its extension to L2 (PAM-L2) support this prediction but differ by focusing on sound contrasts rather than individual sounds and considering both phonetic and phonological levels(Tyler, 2019).

Conversely, the L2 Linguistic Perception model (L2LP) argues that native-like performance can be attained for both 'dissimilar' and 'similar' L2 sounds and contrasts. It posits that all L2 categories can undergo extensive modification regardless of L1-L2 similarity because they are independent copies of L1 categories.

The phonological aspect of language acquisition is crucial for effective communication, especially in learning a foreign language such as Japanese, where accurate pronunciation significantly impacts comprehension and fluency. In modern Japanese, the vowel sequence /ei/ is generally neutralized to /ee/. However, this neutralization is not entirely consistent, particularly in formal or careful speech where /ei/ may be pronounced distinctly as /ei/ (Version & Amundrud, 2023).

(Yazawa et al., 2023) further observed that speakers exhibit variation between /ei/ and /e:/ at the end of sentences, adding complexity to the pronunciation patterns. This study aims to explore these pronunciation patterns among Indonesian learners of Japanese, focusing on how they produce the vowel sequence /ei/ in initial and final positions of familiar Japanese words. The participants, 62 students majoring in Japanese Language Education and Japanese Literature from six universities across six provinces in Indonesia, were chosen to provide a diverse representation of linguistic backgrounds. The need to understand these patterns arises from the observation that Indonesian students often pronounce words according to their letter sequence, which might lead to inaccuracies in producing Japanese vowels (Nogita, 2010).

The sound /ei/ in the Japanese language is a vowel sequence that often occurs in various words and contexts. In Japanese phonetics, it is typically pronounced as a long vowel sound /e:/, where the initial vowel /e:/ is extended, and the /i/ sound is often not distinctly heard (Liu & Takeda, 2021). This phenomenon is called vowel neutralization, where the sequence /ei/ is simplified to /e:/ in actual speech (Osawa et al., 2020). Here /ei/ consists of two vowels, /e/ and /i/. In Japanese, this sequence is generally pronounced with a longer duration for the first vowel /e/, leading to a phonetic realization closer to /e:/.

In natural speech, particularly in informal or rapid contexts, /ei/ is frequently neutralized to /e:/. This means the /i/ component is reduced or not distinctly pronounced, making the sequence sound like a long /e:/. For example, the word "sensei" (teacher) is often pronounced as [sense:], and "gakusei" (student) as [gakuse:]. In formal or careful speech, the distinction between /e/ and /i/ might be more pronounced, but even then, the tendency is to lengthen the /e:/ sound rather than clearly articulating both vowels separately. The /ei/ sequence can appear in different positions within a word. It can be at the beginning, as in "eigo" (English), or at the end, as in "yotei" (plan). Japanese is a mora-timed language, where each mora has an equal duration. The /ei/ sequence, when neutralized to /e:/, counts as two moras, where the duration of /e:/ is approximately twice that of a single mora. In a spectrogram analysis, the formant frequencies (F1 and F2) for the /ei/ sequence show characteristic patterns. For /e/, the second formant (F2) is lower than for /i/. When /ei/ is neutralized to /e:/, the spectrogram would show a consistent F2 value typical of /e:/, without the rising pattern indicative of an /i/ sound. The length of /e:/ can be measured in seconds. This is consistent with the concept of long vowels in Japanese phonetics, where the duration is approximately two to three times longer than that of a short vowel (Peter et al., 2022).

For learners of Japanese, understanding and practicing the pronunciation of /ei/ as /e:/ is crucial for achieving native-like fluency. This involves focusing on the lengthening of the /e:/ sound and avoiding the distinct articulation of the /i/ sound in the sequence. Teachers can use phonetic drills that emphasize listening and repeating long vowel sounds. Tools like PRAAT software can help visualize and measure the duration and formant frequencies, aiding learners in adjusting their pronunciation to match native speakers. In conclusion, the /ei/ sound in Japanese is a vowel sequence that undergoes neutralization to /e:/, with implications for both phonetic analysis and language instruction. Understanding its characteristics and practicing its correct pronunciation are essential for learners aiming for fluency in Japanese.

Indonesian does not have a phonemic distinction between long and short vowels, unlike Japanese. In Japanese, vowel length is crucial, and /ei/ is pronounced as a long /e:/ sound. Indonesian learners may not be accustomed to this distinction, leading to challenges in accurately pronouncing /ei/ as /e:/. The Indonesian vowel system consists of simple vowels that do not combine into diphthongs or long vowels in the same way as in Japanese. This difference in vowel systems can make it hard for Indonesian speakers to produce and perceive the long /e:/ sound. Indonesian speakers are used to pronouncing words as they are written, with each vowel sound being distinct and of equal length (Sutedi, 2019).

The Japanese /ei/ sequence, which merges into a long /e:/ sound, contrasts with the clear articulation of each vowel in Indonesian. The muscle memory and articulatory habits developed from speaking Indonesian influence how learners produce sounds in Japanese. The transition from /e/ to /i/ in the sequence /ei/ might be more pronounced in Indonesian, whereas Japanese requires a smoother, lengthened /e:/ without a clear transition to /i/. Learners might have limited exposure to native Japanese speech patterns, especially for sounds that do not exist in their native language. Without sufficient listening practice, it is challenging to internalize the correct pronunciation of /ei/(Danasasmita, 2009).

Language instruction for Indonesian learners might not focus enough on the subtleties of Japanese phonetics, such as vowel length and mora timing. Without targeted training, learners may struggle with sounds that are not prominent in their native language.

Indonesian learners might find it difficult to distinguish between the long /e:/ and the /ei/ sequence due to the lack of similar distinctions in their native language (Widodo et al., 2021). This perceptual difficulty translates into production challenges. Japanese is a mora-timed language where each mora has an equal duration. Indonesian, being syllable-timed, does not have

this timing pattern, making it hard for learners to adjust their pronunciation to fit the moraic rhythm of Japanese (Wahyuni & Sutedi, 2020).

Pronouncing unfamiliar sounds can be daunting for learners, leading to hesitation or overemphasis on certain sounds. This anxiety can cause variations in pronunciation, such as elongating or shortening the vowel sound incorrectly. Without consistent feedback from native speakers or instructors, learners might not be aware of their pronunciation errors, leading to the fossilization of incorrect pronunciation habits.

The difficulty for Indonesian learners in pronouncing the /ei/ sound at the beginning of Japanese words stems from differences in phonological systems, L1 interference, lack of exposure and practice, perceptual challenges, and psycholinguistic factors. Overcoming these difficulties requires targeted phonetic training, increased exposure to native Japanese speech, and consistent feedback to help learners adjust their pronunciation habits and achieve native-like fluency.

By employing PRAAT software (Gorjian et al., 2013; Widya & Agustiana, 2020) to analyze the recordings of participants pronouncing words with /ei/ in different positions, this study seeks to provide empirical data on the duration and quality of the vowel sounds produced. The findings, which indicate significant differences in the pronunciation durations between native speakers and Indonesian learners, highlight specific phonetic challenges faced by these learners.

These insights underline the necessity for targeted pronunciation instruction and adequate practice time within the Japanese language curriculum (Sudipa, 2020). Addressing these phonetic challenges is essential to help learners achieve more accurate and natural-sounding Japanese pronunciation. Ultimately, the aforementioned research aims to contribute to the development of more effective teaching strategies that can enhance the phonetic proficiency of Indonesian learners of Japanese.

The previous research holds substantial significance in the field of language acquisition, particularly in the context of learning Japanese as a foreign language. It addresses a critical aspect of phonological competence that directly influences learners' ability to communicate effectively and be understood by native speakers. By focusing on the pronunciation of the vowel sequence /ei/, which is typically neutralized to /ee/ in Japanese, this study sheds light on a nuanced area of Japanese phonetics that poses challenges for learners.

The study underscores the need for targeted pronunciation instruction in Japanese language curricula. The significant discrepancies between native speakers' and learners' pronunciation durations indicate that current teaching practices may not adequately address these phonetic challenges. By identifying these tendencies, educators can develop more effective pedagogical strategies that focus on consistent and accurate vowel production.

In conclusion, this research is significant not only for its contributions to the specific area of Japanese phonetics but also for its broader implications in language education. Addressing the phonetic challenges faced by Indonesian learners of Japanese helps in creating more effective language learning environments and enhances the overall communicative competence of learners.

METHOD

The study involved 62 students majoring in Japanese Language Education and Japanese Literature. These participants were randomly selected from six universities located in North Sumatra, West Sumatra, West Java, Central Java, East Java, and Bali Indonesia. The selection criteria ensured that all participants had sufficient background in the Japanese language to engage in the study accurately. The participants in this study are university students aged 19 to 21 years who have studied Japanese for a minimum of two semesters. This study does not account for whether the students had prior Japanese language education during high school or through external language courses, as these factors were not considered variables in the research.

This research employs a reading method, using reading materials derived from the JLPT N3 examination which is partially similar to research conducted by (Yazawa et al., 2023). Before reading, learners were allowed to review materials written in kanji, hiragana, and katakana, which included reading aids or furigana. If any part was unclear, they could ask questions, and recordings were made once the respondents felt prepared.

There are several distinctive sounds in Japanese, known as 「日本語の特殊拍(にほんごのとくしゅはく)」, which are pronounced differently from Indonesian. This study focuses on the long vowel sound /ei/ because native Japanese speakers pronounce /ei/ as /e:/ or a long /e:/. This is similar to how the words /sensei/ repronounced as /sensee/ and /gakusei/ as [gakusee], which are familiar to Indonesian learners. However, the concept of pronouncing /ei/ as /e:/ is not widely introduced for all /ei/ sounds to learners.

As a result, when learners encounter the syllable /ei/ in words other than /sensei/ and /gakusei/, the /i/ vowel sound is still audible, and sometimes it is even heard in [sensei] and [gakusei]. The distinctive Japanese sounds have not received sufficient attention in Japanese language teaching in Indonesia, especially regarding how to pronounce them and the appropriate length of long vowel sounds. The mora theory, or "haku" in Japanese, is still rarely used to train pronunciation of long vowel sounds in Japanese language education in Indonesia.

This research aims to investigate the differences in the duration of the long vowel sound /ei/ when it appears at the beginning and end of words. We selected words that are very familiar to Indonesian learners, such as "reizouko" meaning "refrigerator" and "yotei" meaning "plan," both of which frequently appear in beginner-level Japanese lessons. This research utilizes a pronunciation guide or "voice reference" (VR) obtained from several native Japanese speakers to avoid subjectivity.

PRAAT software which was originally downloaded https://www.fon.hum.uva.nl/praat/ at was

employed to analyze the pronunciation recordings in this study is widely used tool for phonetic analysis provides precise measurements of vowel duration and formant frequencies. PRAAT is highly effective for converting simple recorded voice data into spectrograms. It offers numerous functions, including measuring frequency, pitch, and sound levels. Its application for frequency measurement is common for various objectives. The software enables users to assess and evaluate their pronunciation. Learning involves practicing by visualizing pronunciation through sound waves and spectrograms. Using PRAAT software, the duration of the /ei/ vowel sequence in each recording was measured. This included calculating the average duration for each word and position (initial vs. final). The measured durations from the Indonesian learners were compared with the durations from the native Japanese speakers. The analysis focused on identifying patterns of pronunciation, such as tendencies for longer pronunciations at the beginning of words and simplifications at sentence boundaries. The study was conducted over six months from January to June 2024. This timeframe allowed for thorough data collection, participant instruction, and detailed analysis of the recordings. This methodological approach provided a comprehensive understanding of how Indonesian students pronounce the Japanese vowel sequence /ei/.

FINDINGS AND DISCUSSION
FINDINGS

The duration of the long vowel sound /ei/ pronounced by learners at each university, calculate the average duration, compare the results between universities, and identify any distinctive characteristics of the learners. Then, we will analyze how the learners' pronunciation of the long vowel sound /ei/ compares to the Voice Reference (VR).

Tabel 1. Average Duration of *reizouko* and *yotei*

/ei/	Average Duration of *reizouko* 「れいぞうこ」の平均持続時間 (in seconds)	Average Duration of *yotei* 「よてい」の平均持続時間 (in seconds)
UB	0.207801	0.171302
UNDK	0.246565	0.168185
UND	0.213262	0.155611
UN	0.211043	0.170171
USU	0.125475	0.088177
YPR	0.218651	0.134382
average	0.203799	0.147971

From table 1, we can see that the average duration of the long vowel /ei/ pronounced by Indonesian learners is longer than the Voice Reference (VR) for both the initial and final positions of the vowel in words. The use of PRAAT software in this study is crucial for measuring the duration and identifying the phonetic characteristics of the pronounced vowels. Before conducting the analysis, it is important to understand the distinctive features of the vowels [a, i, u, e, o] within the PRAAT spectrogram.
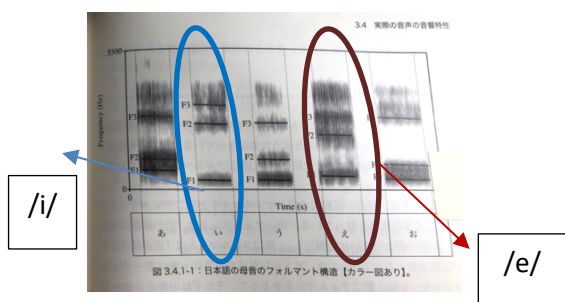

Picture 1. Vowels [a, i, u, e, o] within the PRAAT spectrogram as described by（ビジュアル音声学.(Kawahara, 2018)）

In the image above, it can be seen that the second formant (F2) of the vowel /e/ is lower in position compared to the F2 of the vowel /i/. When pronouncing the syllable /ei/ in the word "*reizouko*," if it is indeed pronounced as /ei/, there will be a noticeable change in the F2 position, which will rise or become higher for the pronunciation of /ei/. On the other hand, if it is pronounced as /ee/, the F2 position will remain unchanged. Additionally, the F2 of the vowel /e/ appears darker than that of the vowel /i/, and similarly, the F1 of the vowel /e/ appears darker than that of the vowel /i/.

Now, let's examine the spectrogram of the long vowel /ei/ in the word "*reizouko*" as pronounced by two Voice References (VR) below:
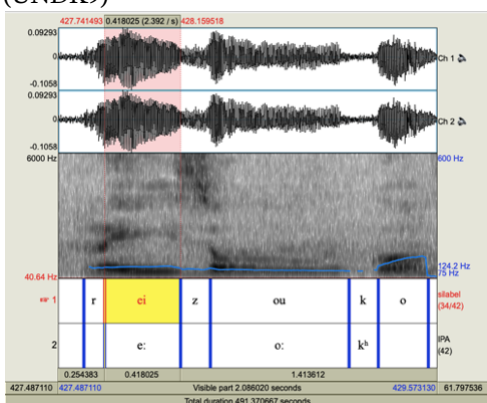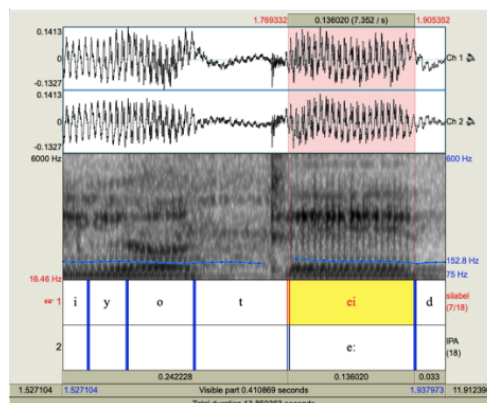
(VR1)

(VR2)
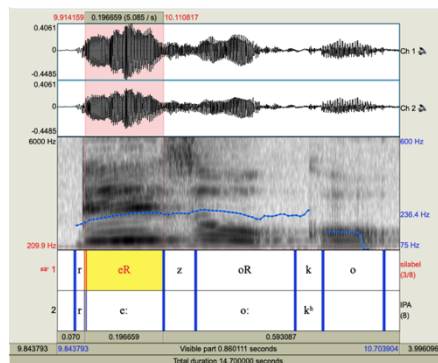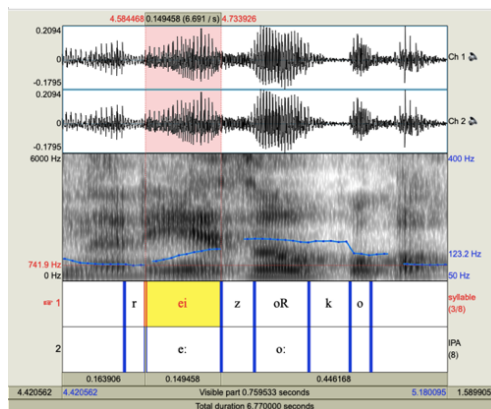
Picture 2. Voice References' Long Vowel /ei/ in "*Reizouko*".

VR1 has a duration of 0.196659 seconds, and VR2 has a duration of 0.149458 seconds, resulting in an average duration of 0.173058 seconds. Let us compare this with the durations produced by Indonesian learners, noting the longest and shortest durations recorded.
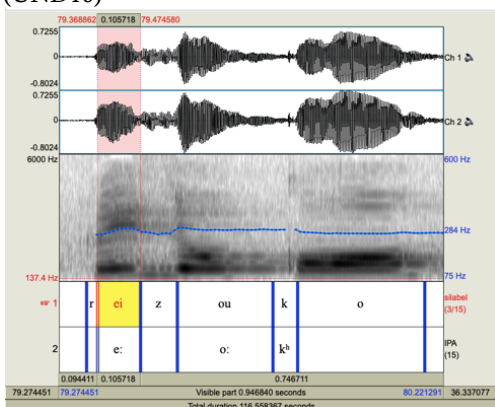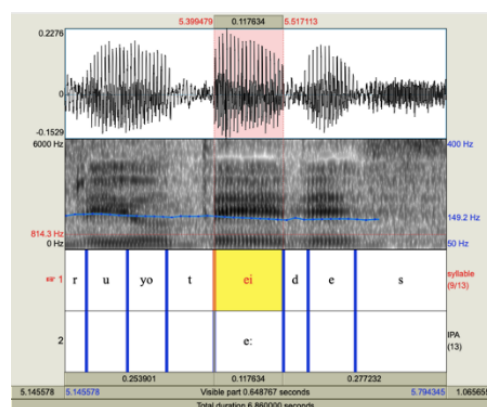
(UNDK9)

(UND10)

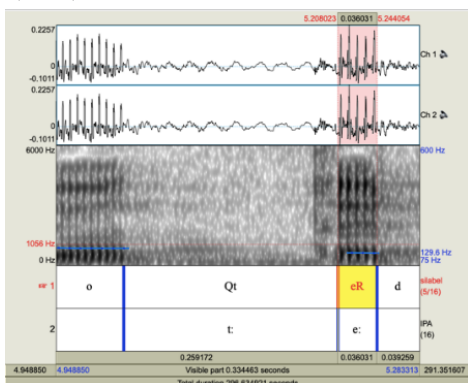Picture 3. Indonesian Students' Long Vowel /ei/ in "*Reizouko*".

The pronunciation of the long vowel sound /ei/ at the beginning of the word "*reizouko*" was the longest by the student UNDK9, with a duration of 0.41 seconds, while the shortest duration was 0.10 seconds by the student UND10. The long vowel sound /ei/ at the end of the word *yotei* was pronounced by two VRs with durations of 0.136020 seconds and 0.117634 seconds, resulting in an average of 0.126827 seconds.

(VR1)

(VR2)

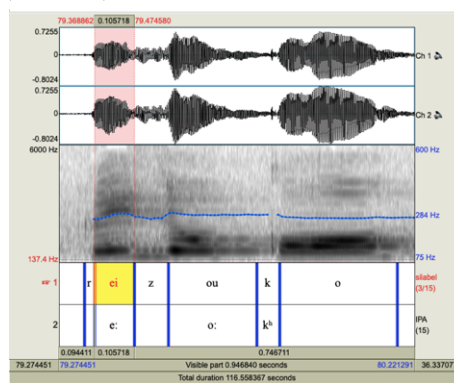Picture 4. Voice References' Long Vowel /ei/ in "*yotei*".

For Indonesian students learning Japanese, the longest pronunciation was by student UB11 at 0.40 seconds, while the shortest was by student UB7 at 0.03 seconds.

(UB11)

(UB7)
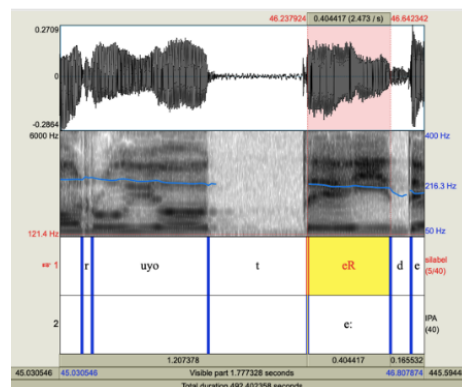
Picture 5. Indonesian Students' Long Vowel /ei/ in "*yotei*".

With very long or very short durations, both UB11 and UB7 students appeared hesitant to continue after the consonant /t/, resulting in a noticeably extended duration of /t/. Observing the vowel length duration of Indonesian students learning Japanese, it is evident that the lengths vary significantly, regardless of the position of the long vowel sound. This variation indicates that Indonesian students have yet to grasp the concept of how long to pronounce a long vowel sound in Japanese. Particularly, they lack an understanding of the "haku" or "mora" system used by native Japanese speakers to denote natural long vowel durations.

This study also investigated how Indonesian students pronounced the long vowel /ei/ at the beginning and end of words. Figure 1 shows that both VR speakers pronounced the long vowel /ei/ as /e:/ or /ee/. In contrast, some Indonesian learners pronounced it as long /e:/, while others clearly pronounced the vowel /i/. Among the students, 55 (90.2%) pronounced "*reizouko*" with a clearly audible /i/, and only 6 (9.7%) pronounced it as /e:/. For the word "yotei," 8 students (22.2%) pronounced it as /eɪ/, while 33 students pronounced it with a distinct /i/ sound—28 from those considered having long durations and 5 from those considered having short durations. Although student UND10 had a very short duration when pronouncing "*reizouko*," the vowel /i/ was still audible. Similarly, students YPR12 and YPR14 pronounced *yotei* with a noticeable /i/ sound.

(UND10)

(YPR12)
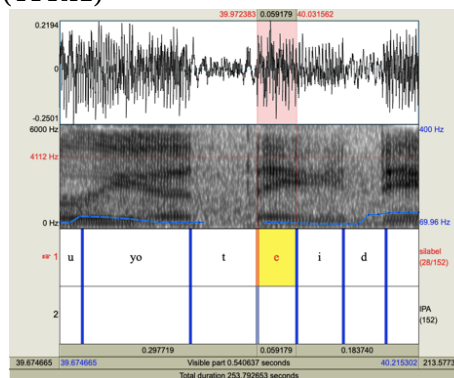
Picture 6. Indonesian Students' Shortest Duration Long Vowel /ei/ in "*yotei*".

When compared with Figure 1, where the second formant (F2) of the vowel sound /i/ is higher than the F2 of the vowel sound /e:/, the spectrogram of the long vowel /ei/ shows a rise after the /e:/ sound due to the presence of the /i/ sound. For learners who pronounce it with a shorter duration, this change is not very noticeable in the spectrogram, but the /i/ sound can still be heard if listened to carefully.

DISCUSSION

The following important factors should be emphasized when analyzing the research's data on Indonesian learners' pronunciation of the long vowel sound (/ei/) in comparison to Voice References (VR). The average length of the long vowel /ei/ as pronounced by students from various colleges in the terms "reizouko" and "yotei" is shown in Table 1. In both words, Indonesian learners often pronounce the vowel longer than the Voice Reference (VR). The

average time for "reizouko" in VR is 0.173058 seconds, but the average for all learners is 0.203799 seconds. In a similar vein, learners' average duration for "yotei" is 0.147971 seconds, whereas the VR average is 0.126827 seconds. This discrepancy suggests that Indonesian learners may overestimate the length of the long vowel /ei/, potentially due to a lack of familiarity with the concept of Japanese long vowels, particularly the "haku" or "mora" system, which determines the timing in native Japanese speech.

Due to a possible lack of understanding about Japanese long vowels, specifically the "haku" or "mora" system that controls timing in native Japanese speech, this mismatch implies that Indonesian learners may overestimate the length of the long vowel /ei/.

At UNDK, the average duration of "reizouko" was found to be the longest at 0.246565 seconds, while at USU, it was the smallest at 0.125475 seconds. As for "yotei," USU students once again had the smallest duration (0.088177 seconds), while UB students had the largest average duration (0.171302 seconds). These differences point to unique approaches taken by students at various universities when it comes to pronouncing long vowels. Students in USU universities, for example, typically have shorter vowel durations than students at other colleges; this could be a result of differing teaching approaches or student backgrounds.

The behavior of the second formant (F2) during the pronunciation of the long vowel /ei/ can be understood by an analysis of the spectrogram shown in Pictures 1-6. Similar to the VR spectrogram, the F2 clearly illustrates an increase from the /e/ sound to the /i/ sound for students who correctly pronounced the vowel as /ei/. On the other hand, students who converted /ei/ to /e:/ showed an unaltered F2, indicating that they did not make the switch from /e/ to /i/. One important finding that emphasizes learners' challenges in learning Japanese vowel length distinctions is this phonetic discrepancy.

Significant differences in vowel duration are seen among Indonesian learners, according to the research. While UND10 produced very short vowel durations (0.10 seconds), certain learners, including UNDK9, produced incredibly lengthy vowel durations (0.41 seconds). In a similar vein, UB11 and UB7 clearly differed in how long they took to pronounce "yotei," with UB11 taking 0.40 seconds and UB7 taking only 0.03 seconds. The differences in comprehension of vowel length are further demonstrated by the hesitancies to proceed following the consonant /t/ in "yotei," which suggests a lack of confidence in the appropriate placement of the vowel sound.

The way that students replace the long vowel /ei/ with /e:/, particularly in words like "reizouko" and "yotei," is a crucial component of the study. Ninety-two percent of students correctly pronounced "reizouko" as /i/, demonstrating a smooth transition from /e/ to /i/. Only nine percent of students mispronounced it as /e:/. On the other hand, 77.8% of students employed a clear /i/ sound when pronouncing the word "yotei," whereas 22.2% of students used /e:/. According to this pattern, students are more likely to pronounce "reizouko" correctly when using the /i/ sound, but they have more difficulty pronouncing *yotei*, where a higher proportion of students either pronounce the last vowel incorrectly as /e:/ rather than as /i/, or they stretch the vowel length needlessly.

Key difficulties Indonesian learners encounter in learning Japanese vowel length distinctions are highlighted by the variations in vowel length, hesitancy, and mispronunciations. Vowel length appears to be either overextended or underextended due to their apparent lack of familiarity with or inconsistent application of the mora system. These results highlight the importance of focused instruction in vowel length timing, with an emphasis on the change from one vowel sound to another, such as /e/ to /i/.

Teachers may concentrate on phonetic exercises that highlight the correct vowel transition. exercises in auditory discrimination to assist students in recognizing and imitating the appropriate vowel length. Visual aids that highlight the phonetic changes between vowel sounds and the significance of duration in native Japanese pronunciation include PRAAT spectrograms. By resolving these concerns, learners may better grasp the intricacies of Japanese vowel time, resulting to

more accurate pronunciation. Let's investigate how Indonesian learners' difficulties with the Japanese long vowel /ei/ relate to more general phonetic principles and the notable phonological distinctions between Japanese and Indonesian in order to make a connection between the prior topic and the paragraph that was presented.

The results of this study show that native Japanese speakers and Indonesian learners differ significantly in how long they pronounce the long vowel /ei/. The concept of phonological interference from the learners' first language (L1) might explain these disparities. As the article points out, the phonological system of the L1 frequently influences second-language (L2) speech production. For Indonesian learners, this is evident in their mispronunciation of the vowel sequence /ei/ when contrasted to native Japanese speakers.

Vowels are defined in phonetics as sounds that are produced in the vocal tract freely and unhindered by air passing through the mouth. Unlike languages with more intricate vowel systems, like English or Chinese, Japanese only uses five vowel phonemes, making pronunciation learning easier. However, because Indonesian does not distinguish between short and long vowels in their native tongue in the same way, learning Japanese can be difficult for them. Long vowels are two to three times longer than their short counterparts. There are no phonemic long vowels in the Indonesian vowel system, and most vowels have the same length. This phonological discrepancy explains why Indonesian speakers of Japanese find it difficult to pronounce long vowels like /ei/, which is usually realized as /e:/ in Japanese, with the proper vowel length.

The excerpt demonstrates how learners' pronunciation is further complicated by vowel neutralization, which occurs in actual Japanese speech when /ei/ becomes long /e/ or /e:/. Vowels are frequently pronounced by Indonesian learners in accordance with their orthographic representation, which might lead to the articulation of /ei/ as two separate sounds as opposed to one long vowel. The spectrogram data that was previously shown reflects this disparity, since learners' duration of the vowel sequence /ei/ is frequently either too long or too short when compared to the Voice Reference (VR) data.

The second formant (F2) for /e:/ does not rise as is usually observed in the transition from /e/ to /i/ when /ei/ is neutralized to /e:/, according to spectrum studies from the current study and the passage that is provided. However, different spectrogram patterns are displayed by Indonesian learners, suggesting that they have not yet fully mastered the right phonetic realization of the vowel sequence /ei/. As the paragraph notes, learners who have difficulty differentiating between vowel lengths have a more marked transition in their pronunciation, and the change in F2 is discernible, albeit being less evident for shorter durations.

Moreover, 'dissimilar' L2 sounds—that is, sounds that are perceptually different from L1 sounds—are more likely to establish new categories and resemble native-like pronunciation, according to the Speech Learning Model (SLM) and its updated version (SLM-r). Due to the lack of a defined boundary between long and short vowels in Indonesian, Japanese vowel length contrasts, such the one between /e:/ and /ei/, may be categorized as "similar" sounds by Indonesian learners, resulting in equivalency classification. This clarifies why learners from Indonesia often pronounce the long vowel /ei/ incorrectly.

The article also discusses the necessity of focused pronunciation instruction, especially for difficult phonetic characteristics like vowel length and mora timing. The spectrogram data from previously indicates that there is a notable degree of variability in the duration of /ei/ at the beginning and end of words among Indonesian learners. This suggests that they may not fully comprehend the Japanese "haku" or "mora" system. This phonetic obstacle is consistent with the passage's observations that Indonesian learners' syllable-timed pronunciation obstructs Japanese's mora-timed structure, resulting in mispronunciations and erroneous production of vowel lengths.

As a result of L1 interference, the lack of vowel length distinctions in Indonesian, and the mora-timed nature of Japanese, Indonesian learners encounter considerable difficulties when producing the long vowel /ei/ correctly, according to the study's data and phonological theories drawn from

the passage. These results highlight the need of integrating focused pronunciation practice into the Japanese language curriculum in order to assist students in overcoming these obstacles and achieving fluency comparable to a native speaker. Additionally, they highlight the significance of employing technologies such as PRAAT software for visualizing and rectifying pronunciation errors.

CONCLUSION

The research highlights significant challenges faced by Indonesian learners in accurately pronouncing the Japanese long vowel /ei/. It reveals that these learners tend to overextend the vowel duration due to unfamiliarity with Japanese phonetics, particularly the mora system that governs vowel length. Differences in pronunciation were observed among students from various universities, indicating inconsistent teaching methodologies or student backgrounds.

The study also points to the influence of the learners' first language, Indonesian, which lacks a distinction between long and short vowels, complicating the acquisition of Japanese pronunciation. The discrepancies in vowel length and the tendency to mispronounce /ei/ as /e:/ further emphasize the need for targeted pronunciation instruction, including phonetic exercises and visual aids, to help learners master the subtleties of Japanese vowel sounds. Overall, integrating focused pronunciation practice into the curriculum is crucial for improving fluency among Indonesian learners of Japanese.

To strengthen the findings, researchers should consider including a larger sample size from each university in the future. This would allow for a more representative understanding of pronunciation patterns and reduce the impact of outliers on the analysis. In addition to quantitative measurements such as duration, qualitative feedback from learners about their pronunciation challenges and experiences with different teaching methods could provide valuable insights into their difficulties and help tailor future instruction.

Based on the identified weaknesses in vowel length pronunciation, it would be beneficial to develop and implement specific training programs that focus on the mora system and the phonetic transition from /e/ to /i/. These programs could involve both classroom activities and self-study resources using PRAAT software or similar tools. The study mentions the use of PRAAT for analysis but lacks emphasis on its application in teaching.

Developing a robust set of visual aids, such as spectra overlays, could enhance learners' ability to perceive and produce accurate vowel lengths. Including auditory discrimination tasks in the curriculum would help learners better identify differences in vowel length and improve their pronunciation accuracy. This could involve listening to native speakers and repeating after them. Facilitate exchanges or workshops between the universities to share best practices regarding pronunciation instruction. This could provide insights into why some institutions yield better results than others. Establish a feedback mechanism where students can regularly convey their challenges and successes after using the new instructional strategies, helping educators to adjust teaching methods accordingly.

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