Study of the Assimilation of Diphthongs in Bahasa through the Perspective of Optimality Theory

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ABSTRACT

This study examines the phonetic changes that occur in the Indonesian language among Indonesian speakers. The aim of this study is to provide a comprehensive analysis of Bahasa using the framework of Optimality Theory. The primary objective of this study is to provide a comprehensive description of the facts and give a theoretical framework for the alteration of phonemes in Bahasa. Additionally, it aims to examine how native speakers pronounce and utilise these phonemes in communication. Phonemic intervention gives rise to various issues, such as assimilation. One potential way to address this issue is the use of Optimality Theory. This study focuses on analysing the diphthong /ai/ in Bahasa Indonesia and its interaction with other phonemes using the framework of Optimality Theory. The study of optimality theory and assimilation in diphthongs enhances our comprehension in specific words of Bahasa Indonesia phonology. Additionally, evidence highlights the significant presence of implicit figures in recent advancements in Optimality Theory.

Keywords: *Phonological phenomena; Diphthongs; Optimality Theory.*

INTRODUCTION

According Arifin and Tasai The official language of Indonesia is *Bahasa Indonesia*. *Bahasa Indonesia* derives from Malay language which has already been used as a lingua franca not only in Indonesia, but also in South East Asian countries (Arifin and Tasai, 2000). *Bahasa Indonesia* was legalised as an official language in Indonesia by *Kongres Pemuda Indonesia* on 28th October 1928. The Congress produced several things which are known as Youth Oath (*Sumpah Pemuda*). One of the contents of *Sumpah Pemuda* is to declare a unity language, i.e. *Bahasa Indonesia*. From that moment, *Bahasa Indonesia* is used as an official language in Indonesia (Adha, 2022).

Diphthongs, often termed as "gliding vowels," are unique sounds that begin with one vowel and transition to another within the same syllable. Unlike monophthongs, which consist of a single vowel sound, diphthongs are a complex blend that creates a rich, evolving sound as the speaker's mouth moves from one vowel position to another. This dynamic nature of diphthongs makes them a fascinating subject of study in the field of phonetics and linguistics.

In linguistic terms, diphthongs are crucial for understanding how vowels contribute to the phonetic identity of words and influence the rhythm and melody of spoken language. They are not mere combinations of sounds but are integral to the phonological systems of many languages, each of which may have a distinct set of diphthongs with specific rules for their use and pronunciation.

Assimilation

Assimilation is a phonological occurrence in linguistics whereby a sound adopts the characteristics of an adjacent sound, aligning with one or more phonetic properties. This phenomenon arises as a result of the proximity of a sound, causing the two sounds to become more similar. Assimilation is a frequent and inherent phenomenon in language that can encompass several phonetic characteristics, including voicing, site of articulation, and way of articulation. Assimilation encompasses various forms and variations.
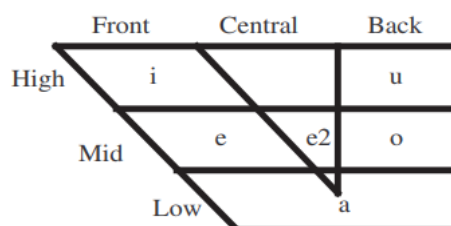
Assimilation is an inherent process that occurs to enhance the fluency and effectiveness of speech output. Smooth transitions between sounds enhance the fluency and facilitate effective communication in a language. The particular patterns and degree of assimilation might differ among languages and dialects.

Dipthongs

Diphthong consists of vowels, i.e., /a/ (like "a" in "father"), /i/ (like "ee" in "screen"), /u/ (like "oo" in "soon"), /e/ (like "e" in "bed"), /e2/ (a schwa sound, like "e" in "learn"), /o/ (like "o" in "boss"), and four diphthongs, /ai/, /au/, /oy/ and /ey/.

Diphthongs in Bahasa Indonesia refer to the occurrence of two vowels inside a single syllable, where the second vowel smoothly transitions into the position of the first vowel. Bahasa Indonesia has a smaller number of diphthongs in comparison to certain other languages. In Bahasa Indonesia, diphthongs are typically created by combining a vowel with the gliding vowel /a/, resulting in a smooth transition from one vowel to another.

Diphthong vowels are divided into two parts; centering and closing. It can be seen that the centering ending in [ə] and has three sounds; [Iə], [eə] and [uə]. The closing sounds are divided in two parts; ending in [I]; [ei], [ai], and [ɔi] and [ʊ]; [əʊ] and [aʊ]. It is contrary to the inventory of Ladefoged and Johnson (2011) their inventories are different with Roach (2009). This study focuses on diphthongs /ai/.

Figure 1. Articulatory Pattern for Indonesian Vowels

Optimality Theory

In Optimality Theory (OT) (Prince & Smolensky 2004), all languages share the same set of universal constraints, and languages differ only in the rankings of the constraints. OT is inherently typological in that if the constraints are formulated correctly, all logically possible permutations of the constraints, i.e. the factorial typology, are expected to produce possible languages and exclude impossible ones. OT proposed that grammars consist of constraints alone (Prince and Smolensky, McCarthy and Prince, 1993).

The prosodic phonological elements of syllable structure and prosodic morphology were the primary focus of this seminal work in optimality theory. It appeared obvious that Optimality Theory could be extended to cover segmental alternations given the prior research on constraints in auto segmental phonology, but there were still issues to be resolved. It can say that, OT is a general theory of crosslinguistic variation and a formal theory of linguistic typology. The function of OT is to response conceptual crisis at the center of phonological thought concerning the role of output constraint.

The OT grammar as an input-output form is optimal, , in the sense that it incurs the least serious violations of a set of conflicting constraints. The grammar takes a given input and creates, assesses, and chooses an infinite number of potential outputs from which to produce the actual output. The evaluation may eliminate some candidate output, until a point is reached at which only one output candidate survives.

In OT, there are two main categories of limitations. Markedness and faithfulness constraints are what they are. An input's propensity to alter its form in order to become less marked is explained by markedness constraints. Cross-linguistically, less marked or unmarked structures are preferred (Chomsky, 1981). Markedness constraints in OT demand that the output forms adhere to some kind of structural well-formedness. The input's structure is protected from changes by faithfulness constraints. To produce the best result, these two sets of opposing constraints take phonological change into account.

In analyse of diphthong there are three candidate in OT, there are diphthong, MAX-IO and Onset. After known about the diphthong the writer interest to do his study to helps provide a more detailed explanation regarding assimilation of diphthongs, especially in linguistic words.

Usually, the constraints in assimilation in word of "Bahasa" have a difference in English. It can constraints *DIPH > MAX-IO > *ONSET. Where is MAX-IO means the speech segments must be identical between input and output candidates. It means 'No Deletion'. *ONSET must not be in the syllable. DEP-IO means the speech segments must not be added to the syllables. This study will explain detail about this topic.

METHOD

The data was collected through direct conversation between all informants and the researcher, as the third informant provided the words wherever gaps in the data

were found (Jubran AL-Mamri, 2023). The recording took place in a serene chamber with three female volunteers, aged 15-20, who accurately identified multiple words with diphthong letters that had been prearranged. Participants were given images in physical format. The data collected in this study was obtained by video capturing.

Before selecting a data collection method, the type of data that is required for the study should be determined (Kabir, 2016). The method in this study was a qualitative approach. Qualitative research is a methodological ap-proach that involves a systematic investigation into a social or human issue with the goal of gaining a deep understanding of it. This ap-proach revolves around creating a comprehen-sive and intricate representation of the subject of study using language, capturing and presenting the unique viewpoints of the individuals in-volved, and conducting the research within a naturalistic setting (Suhery, 2023).

(Hasbalnikistan et al., 2020) qualitative approach is the approach implemented in an object, seeing the object of research as natural as possible, as is and thoroughly. According to Sandelowski qualitative descriptive study is the process of retrieving information from stakeholders about their own experiences with the institutions in order to reconstruct the actual governmental design of public policies or organizational management system (Khatimah et al., 2022). Both nominal and descriptive non-numerical data which cannot be shown as numbers are known as qualitative data in words or sentences format (Taherdoost et. Al., 2021).

FINDINGS AND DISCUSSION

The content of the findings and discussion is an explanation of the research findings, linked to the results of previous studies and critically analyzed based on the latest relevant literature. The findings and discussion can also be done by contrasting the research findings that have been done with the results of the author's research.
This research was carried out by 3 participants who mentioned several words containing the diphthong /ai/ and the following data was found:

Table 1. Diphthong Assimilation by OT

No	Word	Phonetic transcription	*DIPH	MAX-IO	*ONSET
1	Sungai	/suŋai/	*!		**
	Sunge			*	**
2	Petai	/petai/	*!		*
	Pete			*	*
3	Cabai	/cabai/	*!		*
	Cabe			*	*
4	Gulai	/gulai/	*!		*
	Gule			*	*
5	Santai	/santai/	*!		**
	Sante			*	**

Phonotactic rules in Bahasa Indonesia regulate the acceptable and unacceptable combinations of sounds, especially initial sounds. Violations of onset patterns can occur when a word or series of sounds does not conform to the phonotactic limitations of the language. The initial term is "sungai". There is a process of assimilation

occurring in the diphthong /ai/ resulting in /sunge/. Furthermore, the speech segments of the word "sungai" becoming "sunge" are not the same between the input "ai" and the output choices "e". The final stage is the onset. In the given word, we focus on the diphthong /ai/ found in the second vocabulary word that begins with the consonant ng /ŋ/.

The second word is /petai/. An assimilation process occurs in the diphthong /ai/ so that it becomes /petai/. Furthermore, the speech segments of /petai/ become /pete/ is not identical between input /ai/ and output candidate /e/. The last is onset. in this word, we focus on the diphthong /ai/ which is found in the second vocabulary which begins with the consonant letter t /t/.

Thirdly is "cabai". The process of assimilation transforms the diphthong /ai/ into /cabai/. Additionally, the speech segments that transform from /cabai/ to /cabe/ differ between the input candidate /ai/ and the output candidate /e/. The onset comes last. Our attention is directed towards the diphthong /ai/ present in the second vocabulary item, denoted by the consonant letter b/b/. Candidates possessing a diphthong in the final syllable would incur a fatal violation and be disqualified.

Fourthly is "gulai". The assimilation process changes the diphthong /ai/ into /gulai/. Moreover, , the speech segments that transform from /gulai/ to /gule/ differ between the input candidate /ai/ and the output candidate /e/. The onset comes last. Our attention is directed towards the diphthong /ai/ present in the second syllable item, denoted by the consonant letter l/l/. Candidates possessing a diphthong in the final syllable would incur a fatal violation and be disqualified. An asterisk (*) is used to indicate a violation, while an asterisk combined with an exclamation mark (!) represents a fatal violation.

/santai/ is the last word. The diphthong /ai/ undergoes assimilation, eventually becoming /santai/. Furthermore, the speech parts of /santai/ that become /sante/ differ between input /ai/ and output candidate /e/. The final word is onset. This term focuses on the diphthong /ai/, which appears in the second vocabulary, which begins with the consonant letter t /t/.

CONCLUSION

This study explores the process of assimilation, taking into account the implications of Optimality Theory. It has been observed that the majority of native speakers pronounce the diphthong /ai/ in Bahasa as /e/. The assimilation process was observed between the two obstruent segments in Bahasa, affecting the diphthong /ai/. If you have a candidate with a diphtong in the final syllable, it would receive a fatal violation and be eliminated. The research findings indicated that Indonesian speakers tend to pronounce certain words in Indonesian with the diphthong /ai/ as /e/. The variation in pronunciation indicated that there was no exact match between the input and output pronunciations. This indicates that there are phonetic changes in certain words in Indonesian. This proves that sound changes occur in the Indonesian language and the causes of these sound changes can be influenced by various factors related to

ethnicity, age, region and culture. Therefore, there is still a lot of research that can be done in studying phonetic changes that occur in languages, especially Indonesian.

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REFERENCES

Adha, R. (2022). Syntactic Analysis of Movement Transformation in Bahasa Indonesia. *JL3T (Journal of Linguistics, Literature and Language Teaching)*, *8*(2), 95–113. https://doi.org/10.32505/jl3t.v8i2.4809

Chomsky, Noam. (1981). Lectures on Government and Binding. Mouton: The Gruyter.

Hamed Taherdoost. (2021). Data Collection Methods and Tools for Research; A Step-by-Step Guide to Choose Data Collection Technique for Academic and Business Research Projects. International Journal of Academic Research in Management (IJARM), , 10 (1), pp.10-38. ffhal-03741847f

Hasbalnikistan, M. Y., Mahriza, R., & Muslem. (2020). Application of the Reflective Learning Theory in Disclosure of Student Achievements When Learning Grammar Ii in Iain Langsa. *JL3T (Journal of Linguistics Literature and Language Teaching)*, *5*(2), 120–138. https://doi.org/10.32505/jl3t.v5i2.1428

Jubran AL-Mamri, M. (2023). A Generative Phonology: Syllable Structure of Hajji Yemeni Arabic. *JL3T (Journal of Linguistics, Literature and Language Teaching)*, *9*(2), 106–124. https://doi.org/10.32505/jl3t.v9i2.6089

Kabir, S. M. S. (2016). Methods Of Data Collection Basic Guidelines for Research: An Introductory Approach for All Disciplines (first ed., pp. 201-275)

Khatimah, H., Yanelda, S., & Muslem. (2022). Delving Debaters' Self-Development Strategies in Enhancing Their Speaking Perfomance. *JL3T (Journal of Linguistics, Literature and Language Teaching)*, *8*(1), 39–47. https://doi.org/10.32505/jl3t.v8i1.3982

Ladefoged & Jhonson, P. (2011). A Course in Phonetics. New York: Harcourt, Brace Jovanovich

Prince, A. and P. Smolensky, (1993). Optimality Theory: Constraint interaction in generative grammar, Rutgers Center for Cognitive Science Technical Report TR-2

Prince, A., & Smolensky, P. (2004). Optimality theory: Constraint interaction in generative grammar. Oxford: Blackwell Publishing Ltd

Roach, P. (2009). English Phonetics and Phonology. Cambridge. Cambridge University Press.

Sakti, Sakriani & Kelana, Eka & Hammam, Riza & Sakai, Shinsuke & Markov, Konstantin & Nakamura, Satoshi. (2008). Development of Indonesian Large Vocabulary Continuous Speech Recognition System within A-STAR Project.

Suhery, D., Raza, M. H., Purba, H. S. R., & Khairunnisah. (2009). An Optimality Theory Account of English Loanwords In Pilibhit Hindi-Urdu (Uttar Pradesh) India. International Journal of Engineering and Advanced Technology, 8(5c), 758–765. https://doi.org/10.35940/ijeat.e1108.0585c19. September 23

Suhery, D. (2023). *Interlingual Interference in Multilingual Students : An Optimality Theory Approach*. 275–283.

Taherdoost, H. (2021). Handbook on Research Skills: The Essential Step-By-Step; Guide on How to Do a Research Project (Kindle ed.): Amazon.