

## THE INFLUENCE OF PHONOLOGICAL SYSTEMS ON THE ARTICULATORY AND ACOUSTIC STUDY OF INDONESIAN PHONETICS: A DESCRIPTIVE ANALYSIS

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### ABSTRACT

The study of the relationship between phonology and phonetics has an important role in understanding sound systems in Indonesian. Phonology studies sound structure and its relation to meaning, while phonetics analyzes sound physically. In the context of the Indonesian language, the influence of phonology on phonetic studies can be seen in the analysis of allophones and sound variations, phonetic changes, language learning, and linguistic research. This study uses a qualitative research method, which means that this research describes qualitatively the sounds that affect other sounds and describes the voices that are affected. Every sound that is influenced by other sounds will be described and whether these sounds are influenced by sounds in Indonesian. Therefore, the combination of phonological and phonetic studies in Indonesian makes a significant contribution to the understanding and research of the phonetic aspects of the language.

**Keywords:** Relationship, Phonology, Phonetics, Sound, Language

### INTRODUCTION

Every individual is endowed by God Almighty with the ability to speak or speak, except for those who have certain "privileges," such as the speechless and deaf. This ability to speak or speak is acquired gradually according to their age, starting from infants, children, adolescents, and adults (Muslich, Phonology of the Indonesian Language Descriptive System Review, 2015). The language in the social environment of society is different from one another. The existence of social groups causes language to vary as a result of the need of speakers who choose the language to be used according to the situation of their social context. Therefore, the emergence of language variations can be caused by social rules raised by the community itself.

The language in the social environment of the community is diverse. The existence of social groups causes languages to vary as a result of the needs of speakers who choose the language to be used according to the situation of their social context. Therefore, the emergence of language variations can be caused by social regulations introduced by the community itself. The influence of phonology in the study of phonetics in Indonesian is very important to understand. Phonology

is a branch of linguistics that studies sound systems in a language, including the rules that govern the combination of sounds.

Meanwhile, phonetics is a branch of linguistics that studies the production, transmission, and perception of sounds in language. In the study of phonetics, the influence of phonology refers to the relationship between the sound system in a language and its phonetic realization. Indonesian has a sound system consisting of consonant and vowel sounds. For example, in Indonesian phonology, there is a difference between the /p/ and /b/ sounds, each of which is a minimal pair, such as "island" and "bulau". The influence of phonology in phonetic studies will include how the sounds are produced phonetically by Indonesian speakers. One of the important aspects of the influence of phonology in the study of phonetics is the arrangement of sounds in the Indonesian language. There are various phonotactic rules that govern how sounds can be combined in words and in sentences. For example, some sound combinations may be allowed, while other combinations are avoided or not found in words that are often used in Indonesian.

In addition, phonology also affects the variation of sounds in Indonesian. In Indonesian, there are regional phonetic variations related to dialect differences and social variations related to factors such as the speaker's age, gender, and educational background. In the study of phonetics, the influence of phonology will take into account how these variations are reflected in the phonetic realization of sounds in Indonesian. The influence of phonology in the study of phonetics can also involve the concepts of phonemes and allophones. Phonemes are units of sound that have a contrasting role in language, while allophones are phonetic variations of phonemes that appear in a particular context. The understanding of phonemes and allophones in Indonesian influences phonetic analysis, where the observed phonetic variations will be associated with relevant phonemic contrasts. By understanding the influence of phonology on the study of phonetics in Indonesian, we can better understand how Indonesian sounds are produced, how they vary, and how the phonetic rules in this language interact with existing sound systems. Research on the influence of phonology in the study of Indonesian phonetics is constantly evolving, and a deeper understanding of this can provide valuable insights in linguistic studies and language teaching.

## RESEARCH METHODS

This study uses a qualitative approach. According to (Sugiyono, 2013) qualitative research methods are research methods based on philosophy that are used to research in scientific conditions (experiments) where researchers as instruments, data collection techniques and qualitative analysis put more emphasis on meaning. The application used in this approach is the library research method. Literature study is a method that is obtained by understanding and studying theories

from various reading sources related to this research.

## FINDINGS AND DISCUSSION

This research is a research focused on the influence of phonology on phonetic studies in Indonesian through the literature study method or library research that has been carried out during the research and produces relevant information that can be used as research results. Based on a search of several previous research works that have themes that are almost relevant to the themes raised, which are as follows:

First, a journal (Ibrahim, 2013) entitled "The Influence and Influence of Sounds (Phonetic Review on Indonesian Vocabulary)" which reveals that the influence and influence of sounds in Indonesian is due to articulation and distribution.

Second, the journal (Rosmana, 2016) entitled "Objects of Phonetic Study, Speech Tools, Language Sound Classification, and the Process of Language Formation" which reveals that language is an arbitrary sound symbol system used by humans for communication purposes. It is a phenomenon that combines two worlds, namely the world of meaning and the world of sound. Language has three subsystems, namely the phonological subsystem, the grammatical subsystem, and the lexical subsystem. The three subsystems relate to semantic aspects.

The history of phonology can be traced through the development of the use of phonemic terms over time. At the meeting of the Paris Linguistic Society, May 24, 1873, Dufliche Desgenettes proposed the term phoneme, as an alternative to the word Bjm Sprachault. Ferdinand De Saussure in his book "Memoire Sur Le Systeme Primitif Des Voyelles Dan Les Langues Indo-Europeennes" published in 1878, defined phonemes as unique and hypothetical concepts derived from various sounds in related languages. The history of phonology in this paper will further explain the term phonemes. The development of phonology over time can be seen through various streams in the study of phonology (Lafamane, 2020). In terms of the origin of the word, phonology comes from two Greek words, namely phone which means "sound" and logos which means "knowledge".

Therefore, the meaning of phonology is literally "knowledge of sound" (N, Phonology Indonesian, 2012) in journals (Gani & Arsyad, 2019). Then what sound is meant? Is the sound of a can falling a sound in phonology? Or is it the sound of people snoring? The sound of the horn? The answer is 'No'. The sound referred to in phonology is the sound of language. Language sounds are sounds produced by human speech devices or called articulatory organs. What are the Speech Tools? Yes, you are right. Examples of speech tools are lips, teeth, tongue, nasal cavity, etc. Thus, the voice of a person purring is not the sound of language because it is not produced by the human speech apparatus, but the sounds [a], [i], [b] are the sounds of language because the three sounds are produced by the human speech

apparatus. The sound [a] is produced by the lowered front tongue. The sound [i] is generated by the raised front tongue. The sound [b] is produced by both lips (Achmad, 2017). Phonology is a part of the language science that studies sound. The first object of phonological study is the sound of language (fon) which is also known as phonetics, and the second is the study of phonemes known as phonemics. Thus, it can be concluded that phonology is a part of the science of language (linguistics) that studies the sounds of language, the process of its formation and the changes that occur.

Phonology is a linguistic discipline that studies the phonetic system of a language. Roger Lass in (Achmad, 2017) states that in a limited sense, phonology as a branch of linguistics studies the role of sounds in language. This means that phonology studies sounds in language, whether they are sounds used in speech or in general. In addition to studying the role, behavior, and structure of sound as linguistic elements, phonology also studies sound as a phenomenon in the human body that involves the physiological, anatomical, psychological, and neurological aspects involved in the production of such sounds. This linguistic discipline is known as phonetics. Almost the same thing, namely phonology can be seen from two points of view, namely phonetics and phonemics. Phonetics views language sounds as a mere linguistic medium, while phonemics views language sounds as part of a language system. That is, in phonemics, language sounds are the smallest elements of language that are part of the word structure that also function to distinguish meanings.

Furthermore, Clark and Yallop also stated that phonetics is the science of speech that tends to refer to the identification and classification of individual sounds, while phonology is a science that focuses on the organization of speech, which is in the form of sound systems and patterns found in a particular language.

According to the definition of phonology given by linguists, there are two terms, namely phonetics and phonology. Roger Lois (Achmad, 2017) in stating that phonology has a broad meaning and a narrow meaning. Phonology that has a broad meaning means that it includes phonetics and phonemics. Thus, the study of phonology involves not only the organization of sounds in the form of sound systems and patterns, but also the study of how those sounds are pronounced, including the organs used in their pronunciation. The notion of phonology in this broad sense is used by linguists in the United Kingdom. On the other hand, phonology in a narrow sense only includes phonemics, that is, only the study of the organization of sounds in the form of sound systems and patterns (phonemes) and the function of the sound as a marker of meaning. This phonemic term was used by L. Pike, an American linguist. Thus, in phonology that has a narrow meaning, phonetics is considered a distinct field of study. Regarding these two differences (phonetics and phonemics), linguists today consider phonetics as part of phonology

so that in phonology there will be two things to be studied, namely phonetics and phonemics. This is in line with the statement that it is impossible for us to study speech systems and structures without mentioning phonetics. Thus, the definition of phonology used in this module is phonology which includes phonetics and phonemics.

1. **Phonetic.** Abdul Chaer defines that phonetics is a subdivision of phonological studies that studies the sounds of language without paying attention to whether the sounds have a function as a differentiator of meaning or not (Chaer A., 2003). According to Ahmad Muaffaq (N, Indonesian Phonology, 2012) has a function as a differentiator of meaning or not (Chaer A., 2003). According to Ahmad Muaffaq (N, Indonesian Phonology, 2012). that phonetics is a science that studies the sounds of language, which include the production, transmission, and perception of them, without paying attention to their function as a differentiator of meaning. Marsono defines phonetics as a science that investigates and tries to formulate regularly about the sounds of language, how it is formed, what is its frequency, intensity, timber as air vibrations, and how sound is received by the ear (Gani & Arsyad, 2019). According to Verhaar (Verhaar, Principles of general linguistics, 2016) phonetics is a branch of linguistics that studies the "physical" basis of language sounds. He studies the sounds of a language based on the way it is pronounced, and based on its acoustic properties. According to the definition presented by the experts above, it can be generally concluded that phonetics is a branch of linguistics that studies the sound of language both in terms of its formation process, and how the sound is received by the listener, regardless of whether the sound has a role as a marker of meaning or not.

Chaer divides the sequence of the process of the language sound into three types of phonetics, namely:

- a. **Articulatory phonetics**, also known as organic phonetics or physical phonetics, studies how the mechanisms of human speech work in producing language sounds and how those sounds are classified. The discussion includes topics such as the speech devices used in producing sounds in the language, the airflow mechanisms used in producing language sounds, how language sounds are made, about the classification of languages produced and the criteria used, about syllables, as well as about suprasegmental elements or characteristics, such as stress, pauses, duration, and intonation.
- b. **Acoustic phonetics** studies the sound of language as a physical event or natural phenomenon. The focus is on the sound of language as it spreads through the air, including about: sound waves and their frequency and speed as they propagate through the air, spectrum, pressure, and intensity of sound. It also involves decibel scales, resonance, acoustic sound production, as well

as those acoustic measurements. The study of acoustic phonetics is more phonetically oriented than linguistic, although linguistics has an interest in it.

- c. Auditory phonetics studies how the sounds of the language are received by the auditory, so that they are heard and understood. In this case, it is of course discussed about the structure and function of the auditory organs, called hearing, working. How is the mechanism of receiving the voice of the language, so that it can be understood. Therefore, the study of auditory phonetics is more related to medical science, including the study of neurology

Of the three types of phonetics, the most related to the linguistic world is articulatory phonetics, because this phonetics are related to the problem of how language sounds are produced or spoken by humans. While acoustic phonetics is more related to the field of physics that is carried out after the sounds are produced and are spreading through the air. Research on the frequency and speed of sound waves is a research in the field of physics, not a field of linguistics. Auditory phonetics is related to the field of medicine rather than linguistics. Research on the structure and function of the ear is definitely a field of medicine.

2. Phonemics is a language science that studies language sounds that act as a marker of meaning. Related to this definition, phonemics in the Great Dictionary of the Indonesian Language (1997) is defined: (1) The linguistic branch of phoneme structure. (2) The phoneme structure of a language. (3) A method for determining the phonemes of a language. If phonetics studies the different types of sounds that can be produced by speech devices and how each sound is pronounced, then phonemics studies and investigates the possibilities, which speech sounds can have a role in distinguishing meaning. Chaer says that phonemics study the sounds of language that can or function to distinguish the meaning of words. For example, the sounds [l], [a], [b] and [u] and [r], [a], [b] and [u]. When compared, the difference is only in the first sound, namely the [l] sound and the [r] sound. Based on (Gani & Arsyad, 2019), phonemics is a sub-discipline of phonology that investigates and studies the sounds of speech/language or the phoneme system of a language in its role as an identifier of meaning. Thus, it can be concluded that the term phonemic can be interpreted as a small unit of language that has a functional function, which means that phonemic units serve to distinguish meanings.
3. Allophone, which is the smallest part of language that does not have a distinguishing function, if it is replaced, will not affect the change in meaning (Nasution, 2010) in the journal (Amrullah, 2016). Language is an arbitrary sound signal system used by humans for communication purposes. This is a

phenomenon that unites two worlds, namely the world of meaning and the world of sound. Language has three parts of the system, namely the phonetic system, the grammatical system, and the lexical system. The three parts of the system relate to semantic aspects.

Phonological subsystems that include linguistic sound elements related to articulatory, acoustic, and auditory elements are studied by phonetics; The sound elements of language related to their function in communication are studied by phonemics. Grammatical subsystems that include words, word parts (morphemes), and word formation processes are studied by morphology; Meanwhile, the arrangement of words in the form of phrases, clauses, sentences, and discourse is studied by syntax. The lexical subsystem that includes vocabulary (lexicon) is studied by lexicology. The phonological, grammatical, and lexical subsystems are related to semantic aspects or meaning learned by semantics. Phonetic division has more specialized components in it. For example, when a speaker pronounces a speech, articulatory phonetics or also known as physiological phonetics has several studies that look at the components of speech into several processes, namely: 1) the brain, 2) motor nerves, and speech apparatus.

There is one method when we analyze language sounds. The method is called the parametric method. This method considers speech as a single physiological system in which the variations of articulation are in an ever-changing and complementary sound channel. Phonetics (articulatorial) is the study of how to form language sounds. The main source of power to form language sounds is the air that comes out of the lungs. The air is sucked into the lungs, then expelled when breathing. When air comes out of the lungs through the throat, some experience obstacles and some do not experience obstacles (Ibrahim, 2013). The process of forming and speaking sounds takes place in a continuum. According to functional sound analysis, the continuous flow of sound can be grouped by certain parts. Even so, there are also sounds that cannot be grouped into specific parts called suprasegmental sounds. Therefore, language sounds can be divided into (1) segmental sounds and (2) suprasegmental sounds.

The process of creating language sounds generally consists of 4 types, namely: (1) the process of producing sound from the lungs, (2) the phonation process, which is the passage of sound through the throat, (3) the articulation process, which is the process of sound formation by articulation and, (4) the oronasal process, the process of producing sound through the mouth or nose (Rosmana, 2016). In this learning activity, various types of language sounds produced by speech devices will be discussed. This classification of sounds is based on the pronunciation process. Language sounds can be grouped into (1) vowels, consonants, and semivowels, (2) nasal and oral, (3) long and short, (4) hard and soft, (5) singular and double, (6) egressive and ingressive (, and (7) geminat and

homorgan (Lafamane, 2020).

Indonesian vocabulary is certainly pronounced with Indonesian sounds. The Indonesian sounds come from human speech tools. Human speech devices certainly have their uniqueness in pronouncing sounds so that there are sounds that are spoken influenced by other sounds. In addition, there are also sounds that affect other sounds or in other terms are called influences. Thus, in producing sound there is an influence and influence. This research was presented by David Stampe in (Simanjuntak, 2009) This theory assumes that the sound structure of a language is generally a remnant or part of a natural processing-process structure that is adapted in a certain way by language experiences. Stampe further added that one phonological process incorporates a single possible sound difference into the group of sound differences that are least hampered by the limitations of human ability to speak.

According to the theory developed by Stampe, it can be understood that in the pronunciation of vowels language experiences real processes in pronouncing sounds. In the pronunciation, there is an influence and influence in reciting the voice. This research is focused on the pronunciation of sounds in Indonesian vocabulary. These influences and influences need to be explained and classified properly. By knowing the phonemes that are influenced and the phonemes that affect them, Indonesian users must pronounce the phonemes well. Although it is inevitable, Indonesian speakers are at least aware that the phonemes they speak are influenced by other phonemes. Indonesian speakers are also expected to be able to know which phonemes are influenced and which phonemes affect them.

The influence of sound systems (phonology) in Indonesian affects the physical pronunciation of sounds (phonetics) in regional variations. Variations of sounds that are influenced by other sounds and there are sounds that influence other sounds. The influence and influence of language sounds arises because (1) there is an air explosion that comes out of the human speech apparatus urgently in the pronunciation of Indonesian vocabulary, (2) the influence of the first language/mother tongue (B1) on speakers who often use B1. (3) interference in the Indonesian language is also influenced by phonemes from B1 (Ibrahim, 2013). In the practice of speaking phonemes or language sounds, they do not stand alone, but are interrelated in a sequence of sounds. The causes of these changes can be detailed, among others: due to coarticulation, due to the influence of sounds that precede or recede, due to distribution, and other consequences.

Phonological processes occur when two morphemes are related or pronounced after the other, causing changes in phonemes or in intersecting phonemes. Phonological processes can be grouped into four types, namely (1) assimilation, (2) syllable structure, (3) weakening and strengthening, and (4) neutralization (Munirah, 2019).

The influence of phonology on the pronunciation of foreign sounds borrowed in Indonesian is reflected phonetically. Foreign sounds borrowed in Indonesian will be adjusted to the Indonesian sound system. This happens because of the difference in sound system between foreign languages and Indonesian. An example is the word "computer" which is pronounced "computer".

In the practice of speaking phonemes or language sounds, they do not stand alone, but are interrelated in a sequence of sounds. In every knowledge or study, there will be a target or goal that describes the process or results of the study. Phonology is a sub-discipline in linguistics that discusses the "sound of language". Like the main science, namely linguistics, phonology has a relationship with other sciences, resulting in interdisciplinarity, for example phonology and medicine, speech therapy, and others.

In the general linguistics module, you have learned that there is linguistic division. There is a field of linguistics called microlinguistics, and a field of macrolinguistics. The field of microlinguistics studies, studies, or analyzes the internal structure of language. In terms of the internal structure of the language, you know for example; phonology, morphology, and syntax. The field of macrolinguistics studies and analyzes or studies the relationship between linguistics and other sciences. With sociology, for example, there is a study called sociolinguistics. With psychology, for example, there is a study called psycholinguistics. With anthropology, anthropolinguistic studies emerged. In addition to the linguistic division of microlinguistics and macrolinguistics, there is also a linguistic division of the study objectives, namely theoretical linguistics and applied linguistics.

Theoretical linguistics seeks to conduct research on language or languages, or also on the relationship of language with factors outside of language, only to find the rules that apply in the object of its research. So, these activities are only for theoretical purposes.

Unlike theoretical linguistics, applied linguistics seeks to conduct research on language or the relationship of language with factors outside language in order to solve practical problems that exist in society

With regard to the purpose of linguistic research, the purpose of phonology or the study of phonology is distinguished for theoretical and practical purposes.

- a. Theoretical goal: For a phonetician, the goal of his study is to discover general truths and formulate laws about sound and pronunciation, and the recognition of the production of spoken sounds. In addition, the theoretical goal of this phonetic study is to describe, classify, and demonstrate the function of relationships with each other. In more detail, the theoretical objectives of phonetic studies for a phonetic expert include: a. Describe how the organs function as a means of speech, language sound producer, b. Describe how the

process of language sounds occur, c. Classifying language sounds based on their characteristics, d. Describes the sequence of sounds in a specific sound unit. One of the units of sound is a syllable, and e. Voice recording in phonetic writing.

- b. Practical purpose: Linked to theoretical research, applied linguistics (applied phonology) seeks to investigate language or its relationship with factors outside language for the purpose of solving practical problems in society. For a phonetician, a broad understanding of phonetics will definitely be of great help in completing and executing his task. For phonetic researchers with a theoretical understanding of sound, researchers can provide formal core symbols of language, both in general and for specific languages, connecting the sound symbol with its form, i.e. determining its place in relation to other aspects of the overall description. The practical objectives for the study of phonetics are related to interdisciplinary fields. For language teaching, phonetics are needed for the purpose of speaking training, hearing of the deaf. To help people who are learning a second language, a dictionary accompanied by phonetic transcription is indispensable. So, for the practical purpose of compiling a dictionary that pays attention to the phonetic aspects of words in a dictionary, several phoneticians have tried to do it. Along with the development of technological advancements today, a kind of audio dictionary has been produced that pays attention to aspects of pronunciation and intonation. Another practical goal of this phonological research is for language teaching. In the context of learning to write, especially in grammar, knowledge and mastery of spelling rules are essential. Another thing that can be revealed from the practical purpose of phonological research is the preparation of dictionaries. As a result of linguistics, dictionaries are inseparable from knowledge of language sounds (phonemes) in a language.

## CONCLUSION

Phonology is a branch of science that studies sound systems in a language, while phonetics studies these sounds physically. The influence of phonology on the study of phonetics lies in the understanding and analysis of sound systems in Indonesian, which can help identify and explain phonetic differences in sound production. Phonology identifies phonemes in language, which are sound units that have different meanings, while phonetics studies the variations of concrete sounds or alphones that appear in pronunciation. The influence of phonology on the study of phonetics is in understanding the allophones that appear in Indonesian and how these variations are produced phonetically. Phonology studies the variations in sounds in language that can be caused by phonetic changes or other factors. The study of phonetics in Indonesian will pay attention to the phonetic changes that

occur in a sound and its impact on the phonological system of the language. The influence of phonology on the study of phonetics also plays an important role in language learning and teaching. Understanding phonology can help Indonesian speakers gain awareness of the sound system and pronunciation rules in the language. The influence of phonology on the study of phonetics in the Indonesian language also contributes to linguistic research.

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