Production and Perception of German Word Stress by Indonesian Learners of German: A Suprasegmental Study

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Abstract
In foreign language learning, understanding is not limited to basic sounds such as vowels and consonants, but also includes suprasegmental features that influence meaning and clarity in communication. One important suprasegmental feature is word stress. For Indonesian learners of German, applying correct word stress often presents a particular challenge. This study aims to examine how learners perceive and produce word stress in the German language. A qualitative descriptive method with an auditive phonetic approach was employed to investigate the perception and production of word stress as a suprasegmental element in German. Data were collected in two stages: (1) a production task involving the oral reading of words and pseudowords, which were analyzed auditorily, and (2) a perception task in which participants listened to recorded words and identified the position of stress. The analysis compared the accuracy of participants' production and perception and identified common patterns of error. The findings are expected to serve as a basis for developing more contextual and learner-oriented suprasegmental phonetics teaching materials for Indonesian learners of German.

Keywords: *suprasegmental, word stress, production, perception*

Introduction

In learning a foreign language, mastering phonetics encompasses not only segmental sounds such as vowels and consonants, but also suprasegmental elements, which play a crucial role in conveying meaning and ensuring clarity of communication. According to Crystal (2008), suprasegmental elements including stress, intonation, duration, and pauses provide prosodic nuances that differentiate meaning in speech and serve as markers of important linguistic structures. One crucial suprasegmental element is word stress, which in German plays a distinctive role in distinguishing the meaning of certain words (Roach, 2009).

German generally places stress on the first syllable in basic words, as in the word *Butter* And *homes* (Kohler, 1990). However, in loanwords or compound words, stress patterns can vary, and certain affixes such as the prefixes be-, er-, ent-, ge-, ver-, and zer- are usually unstressed (Wiese, 1996).

For German learners in Indonesia, correct word stress is often a challenge due to differences in the stress systems between Indonesian and German, which interfere with the production and perception of word stress. Previous research has also shown that learners from language backgrounds that lack phonemic lexical stress, such as Indonesian, experience

difficulties in the production and perception of word stress (Fery & Ishihara, 2010; Fuchs et al., 2021; Harahap et al., 2025).

Therefore, this study focuses on observing how Indonesian learners recognize and produce word stress in German through an experimental phonetic approach.

A. Suprasegmental Elements in Linguistics

In the study of phonetics and phonology, according to David (2008), suprasegmental elements refer to sound effects that are not limited to a single sound or phoneme, but encompass several segments within a single utterance. Examples of these elements include word stress patterns, intonation, and pauses or boundaries between words and phrases (junctures). These elements play a crucial role in shaping meaning and clarity in spoken communication.

According to Trofimovich and Baker (2006), training these elements can improve students' fluency and comprehension in speaking. Hahn (2004) also showed that listeners understand speech more easily if word stress is placed correctly, especially in communication between speakers of different languages. Mastery of this aspect is crucial in foreign language learning, especially since suprasegmental elements are rarely taught explicitly (Féry & Ishihara, 2010).

B. Word Stress in Phonetics and Phonology

Word stress is the emphasis of a syllable in a word through increased intensity, pitch, and duration. Stressed syllables generally sound higher in pitch, stronger in sound, and last longer than unstressed syllables (Lehiste, 1970). Van der Hulst (2014) states that word stress not only helps in the rhythm of speech, but is also an important structural marker. In German, word stress plays a role in distinguishing meaning and word category. As Wiese (1996) points out, differences in stress can change meaning, for example in *'umfahren'* and *'um'fahren'*. Hall (1992) emphasizes that although stress in German is generally placed at the beginning of the word, affixes such as be-, ent-, and ver- are usually unstressed. This presents a challenge for foreign learners, especially Indonesian speakers who lack a phonemic stress system.

C. Word Stress Production

The production of word stress involves phonetic aspects such as pitch, intensity, and duration. Ladefoged (2005) showed that stress on certain syllables is characterized by a higher pitch and longer vowel duration. This is supported by Franich et al.'s (2022) statement that stressed syllables in various languages are generally produced with certain articulatory and acoustic characteristics. Some prominent characteristics include longer duration, more pronounced jaw drop during pronunciation, more extreme differences in pitch (fundamental frequency), and stronger vocal intensity compared to unstressed syllables. Fuchs et al. (2022) observed that common errors made by learners are flat intonation or stressing the wrong syllable, especially in verbs with prefixes that should not receive stress, such as *zerbrechen* and *entkommen*. Harahap et al. (2025) noted a tendency for learners to stress prefixes in indivisible verbs due to a lack of phonological understanding.

D. Word Stress Perception

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In addition to production, stress perception also plays an important role. Stress perception encompasses the learner's ability to detect acoustic differences between syllables. Frota et al. (2011) explain that listeners must be able to perceive stress signals such as pitch, duration, and intensity. Their research states that although pitch is often associated with stress, in European Portuguese (EP), pitch is not considered a primary stress marker. This is because most stressed syllables in EP do not exhibit pitch accents. In situations where vowel quality cannot be used as a cue, duration is found to be a key feature in signaling stress in the language. Field (2005) found that when stress is placed correctly, listeners are quicker and more accurate in understanding the word. Inaccurate stress perception can lead to difficulties in understanding the speech as a whole.

Method

This research uses a qualitative descriptive method with a phonetic approach. Auditive, which aims to observe the production and perception abilities of word stress as a suprasegmental element in German. The research subjects consisted of 20 4th and 6th semester German Language Education students from Pattimura University who were selected purposively.

Data collection was carried out in two stages: production recording and perception testing. In the production phase, students were asked to orally read a list of 30 German verbs. Oral production was recorded using a simple recording device, such as a mobile phone. The recordings were then manually analyzed using auditory methods by the researcher and one other assessor. To support word stress identification, the recordings were opened using Praat phonetics software, but only to visually observe basic prosodic elements such as pitch and intensity. The analysis remained qualitative and did not involve statistical processing or advanced numerical calculations.

In the perception phase, participants were asked to listen to a series of German words pre-recorded by a native speaker, each with varying stress placement. They were then asked to determine the stress position using the answer choices provided on a worksheet. Data from this perception task was used to assess the participants' ability to recognize word stress according to German prosodic norms.

All data were analyzed by comparing the accuracy of each participant's perception and production of word stress. The analysis focused on emerging trends and common errors made by participants in both areas. The results of this analysis are expected to provide an initial overview of the prosodic challenges faced by German learners in Indonesia and serve as a basis for developing contextual suprasegmental phonetics teaching materials.

Results and Discussion

A. Word Stress Production Ability

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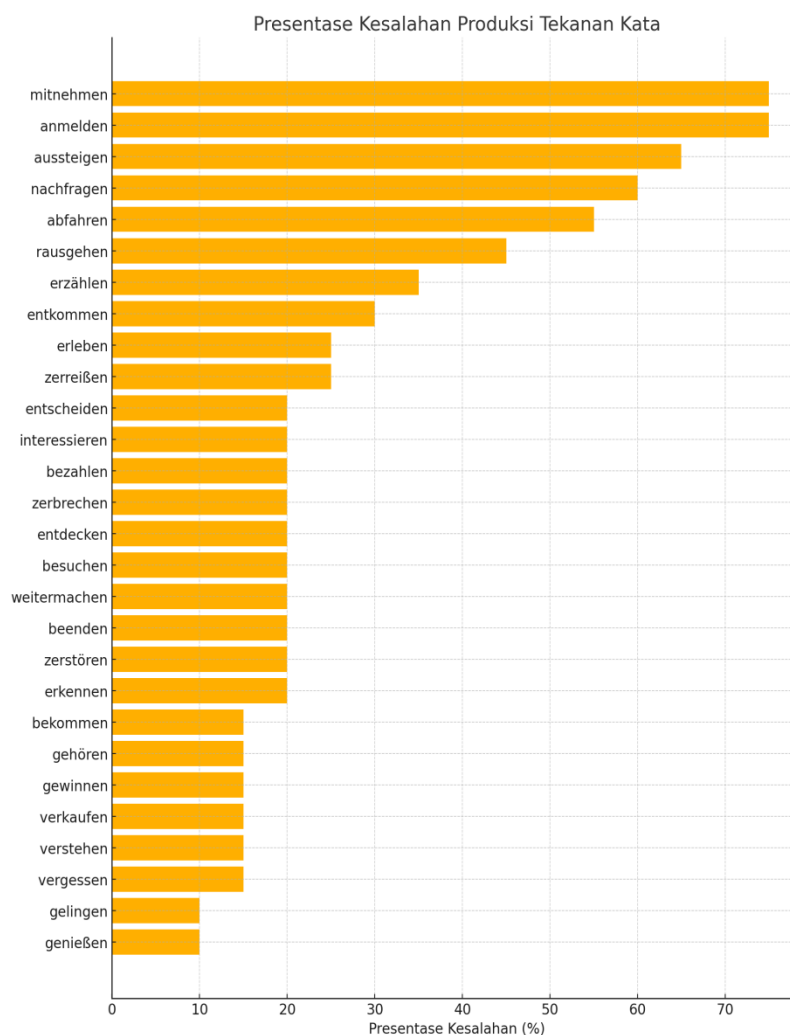
This graph shows students' error rates in producing word stress when pronouncing German verbs. The words with the highest error rates are mitnehmen and anmelden, each with over 70% errors. This is followed by aussteigen, nachfragen, and abfahren, which also show high error rates above 60%. What these words have in common is their complex morphological structure most are trennbar verbs (with separable prefixes). This indicates that participants have difficulty identifying the prefix as the syllable that should receive primary stress when pronouncing the word, a common error among foreign learners.

In addition, words like *rausgehen, erzählen, and entkommen* also show relatively high levels of production errors, although lower than the previous group. Interestingly, even though erzählen is a relatively frequently used verb, its error rate remains striking, possibly due to the mistaken placement of stress on the first syllable instead of the second.

On the other hand, words like *genießen, gelingen, vergessen, verstehen, verkaufen, and gewinnen* showed a low percentage of production errors, namely below 20%. This could indicate two things: first, students are quite familiar with the pronunciation of these words; second, the word stress is relatively easier to understand due to their regularity or because they often appear in learning contexts.

Overall, these data confirm that students' primary difficulty in producing word stress is closely related to the presence of prefixes, especially in prefixed verbs *(trennbare Verben)*.

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This indicates the need for production training that emphasizes prefixed syllables as stress sites, as well as the use of visual and auditory strategies such as audio models, syllable drilling, and word stress mapping. More systematic pronunciation training can help students develop stronger prosodic intuition, resulting in more accurate and natural word stress production.

B. Perception of Word Stress
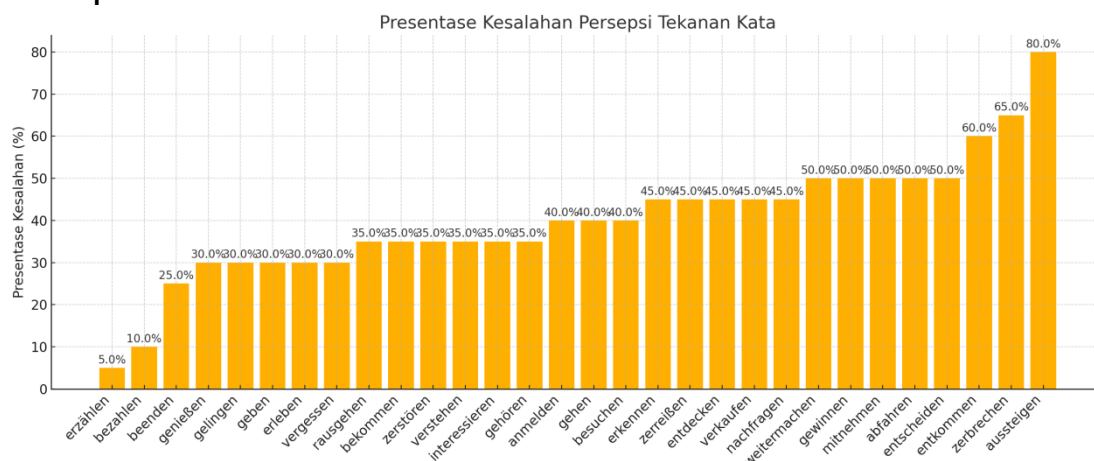
The graph "Percentage of Word Stress Perception Errors" shows that most participants had difficulty recognizing word stress in German verbs, especially prefixed verbs. The word *aussteigen* ranked highest with an error rate of 80%, followed by *zerbrechen* (65%) and entkommen (60%). Errors were also high in words such as *entscheiden, abfahren, mitnehmen,* and *nachfragen,* all reaching 50%. Most of these words are separable prefixed verbs (trennbare Verben), where stress usually falls on the prefix, but is often not recognized correctly by learners. This indicates that participants do not yet fully understand word stress patterns in complex verbs, especially when they are similar in form but prosodically different.

Meanwhile, the group of words with a moderate error rate (30–45%) includes verbs such as *gehen, bekommen, verstehen, interessieren,* and *anmelden.* Many of these words are frequent in everyday learning, but remain confusing in terms of stress due to variations or unclear prefixes. Errors in this group may be caused by a lack of exposure to authentic pronunciation or inconsistencies in stress patterns between similar words. On the other hand, the words with the lowest error rates are *erzählen* (5%), *bezahlen* (10%), and *beenden* (25%). These words tend to be more regular in stress or have been encountered frequently by the participants, making them more likely to recognize them correctly.

Overall, this graph indicates that students' prosodic awareness, particularly regarding word stress (*Wortakzent*), still needs to be improved. Training in the perception and production of word stress should be more focused on prefixed verbs, especially separable ones, as the stress patterns in these types are often non-intuitive for learners of German as a foreign language. Teaching strategies such as the use of audiovisuals, drilling with contrastive word pairs, and phonetic analysis through software (e.g., Praat) can help improve the accuracy of stress perception in learning.

C. Factors Affecting Difficulty

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Students' difficulty recognizing and producing word stress in German is influenced by several main factors. First, the morphological structure of verbs plays a significant role, especially in separable prefixed verbs (trennbare Verben) such as *mitnehmen, aussteigen,* and *anmelden.* The stress in these words is supposed to fall on the prefix, but many learners fail to realize this because the infinitive form and its use in sentences do not always clearly reflect this separation. Second, inconsistent stress patterns between seemingly similar verbs also confuse students. For example, *verstehen* and *interessieren* are both prefixed, but the stress falls in different positions. This makes it difficult for students to guess the correct pattern without a strong understanding of prosodic pronunciation.

A third factor is the lack of exposure to authentic pronunciation models. Without hearing native speakers or sufficient audio practice, students struggle to develop the prosodic intuition to accurately recognize and imitate word stress. Furthermore, the frequency of word use also influences error rates. Words that frequently appear in lessons, such as *erzählen* or *genießen*, are less likely to be mispronounced than complex words that are rarely taught explicitly. Interference from the mother tongue (L1) also plays a role. Because Indonesian does not have a grammatically functional word stress system, many students place stress inconsistently or even ignore it.

Finally, another important factor is the lack of emphasis on suprasegmental aspects such as stress and intonation in foreign language learning. Often, learning focuses on segmental aspects such as vocabulary and grammar, while word stress is considered secondary. However, errors in stress can affect comprehension and speech clarity. Therefore, more explicit and structured instruction in prosody, particularly through perception and production exercises, is essential for students to master word stress more effectively.

Conclusion

This study shows that German learners in Indonesia still face significant challenges in the production and perception of word stress, a suprasegmental element. Stress placement errors, as well as their poor auditory stress discrimination abilities, reflect their insufficiently developed sound sensitivity.

Factors influencing this achievement include differences in stress patterns between Indonesian and German, a lack of explicit phonetic training in learning, and limited exposure to authentic spoken input in German. Therefore, phonetics instruction that emphasizes word stress needs to be designed more contextually, through the integration of perception and production exercises, the use of audio-visual media, and metacognitive approaches that support students' phonological awareness.

Further research is recommended, involving learners at a wider range of proficiency levels and employing more in-depth acoustic analysis to gain a more objective understanding of pronunciation parameters. Furthermore, the effectiveness of specific teaching methods needs to be evaluated to develop more effective phonetic learning strategies tailored to the needs of foreign language learners in Indonesia.

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