

THE IMPACT OF STUDENTS' MORPHOLOGICAL AWARENESS: SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

In the Latvian education system and society, concerns are growing about students' language competencies, including grammar. The relevance of these problems is also reflected in societal concerns about insufficient grammar skills and a lack of systematicity in the teaching content. Grammar is a system that includes word formation, morphology and syntax. Mastery of the grammatical systems of native languages is one of the most critical conditions for fully developing a child's/scholar's speech and mental abilities; however, it is essential to understand how precisely the comprehension of some regions of grammar influences language usage. Therefore, the research question is – how is “morphological awareness” defined in international literature and what domains of native language use are impacted by it? A systematic literature analysis, with a focus on global perspectives, was conducted to answer this question. The study aimed to clarify the explanation of morphological awareness in international literature (comparing it to what is used in Latvian grammar) and determine its role in using the native language.

A comprehensive review of studies from 2003 to 2024 published in the Scopus database was conducted for this study. The material was selected using the keywords “morphological awareness/competence”. Using strict inclusion (articles published between year 2003 and 2024, articles in English) and exclusion criteria (not related to native language acquisition, language not belonging to the Indo-European language family, not focusing on school-aged children, focusing only on students with learning disabilities), 23 articles (from the USA, the UK, Brazil, Portugal, Spain, Switzerland, Canada, Norway, Germany, Netherlands) on morphological awareness were selected. These articles were then meticulously analysed, ensuring a thorough and reliable research process, using thematic analysis, focusing on their primary results and conclusions.

The article summarises the research results on language domains influenced by morphology and explains the use of morphological awareness in foreign scientific literature. The term mentioned in the analysed studies is primarily related to identifying word composition and realising the meanings of morphemes. Analysing studies on students' morphological awareness in several Indo-European language families (English, German, French, Dutch, Portuguese, Spanish, and Norwegian), it is concluded that it significantly affects reading comprehension, writing, vocabulary, and pronunciation. Its importance is particularly significant in languages with deep orthography.

Keywords: *morphological awareness, reading comprehension, orthography, vocabulary, writing.*

Introduction

Current issue: lack of knowledge of grammar

Language understanding and usage are formed both outside formal education and within schools. Schools play a significant role in development; however, the results of state language proficiency exams in Latvian have been mediocre for years. The biggest problems arise with language competence (grammar) assessment tasks. For instance, in diagnostic tests for 6th graders from 2017 to 2022, an average of 54% of students correctly completed grammar tasks (not exceeding 60% in any year) (VISC, 2017–2022).

There is a trend of reducing the emphasis on grammar in the curriculum, transitioning from a grammatical approach to a communicative one. Society has raised concerns that this negatively impacts language quality (Laiveniece & Lauze, 2021). This applies to Latvian grammar and English, as a similar trend has been observed (The Guardian, 2019).

Morphology – an important part of grammar and an essential branch of linguistics

Morphology, which focuses on the word, is the foundation of grammar. It examines the structure of the word, its forms and paradigms, grammatical relationships expressed with word forms, grammatical categories, and morphological groups or parts of speech (Paegle, 2003). Morphology can be considered the basis upon which other knowledge is built; therefore, inadequate mastery of it can lead to problems in overall language usage.

However, it is essential to note that understanding morphology as a branch of linguistics can differ across languages. In modern Latvian linguistics, it is accepted that word structure is studied by the subfield of morphology called morphemics, while word formation is considered an independent branch of linguistics (Kalme & Smiltneiece, 2001). Together with syntax and morphology, these fields form the core of grammar. In English, however, morphemics and word formation are considered parts of morphology, meaning that grammar consists only of morphology and syntax (Carlisle, 2003).

State of art

When it comes to researching the significance of morphology, Joanne Carlisle's (Carlisle, 2000) name should be mentioned. A significant focus of her research is the impact of morphology on reading proficiency. Similar research interests and essential contributions in exploring the role of morphology are also made by John Kirby (2012, 2017) and H el ene Deacon (2004, 2011). Their research confirms that morphology plays a significant role in language usage, particularly in reading and writing.

In Latvian linguistics, morphology has been widely researched. In the 21st century, morphology has been studied by researchers such as Daina N itiņa (2001), Vilma Kalme, Gunta Smiltneiece (2001), and Dzintra Paegle (2003).

A notable addition to this body of research is a book, *Latvian Grammar* (Kalna a & Lokmane, 2021), written in English, making it accessible to an international audience. It thoroughly examines Latvian grammar and contains detailed section on morphology.

This chapter is precious for linguists and language enthusiasts worldwide who are interested in Latvian morphological aspects.

Dissertations on the topic have also been developed in the last decade. Special attention is given to various verb aspects (Ivulāne, 2015; Deksne, 2021).

Notable works in morphemics include those by Andra Kalnača (2004) and Anna Vulāne (2013a, b). In the field of word formation in the Latvian language, Emīlija Soida (2009) has made significant contributions. This area is also within Anna Vulāne's (2013b) scientific interests. She has studied word formation from a linguistic perspective and from the standpoint of school didactics (Vulāne, 2011).

Since morphological competence is also related to correct pronunciation, it should be noted that linguist Dace Markus has made a notable contribution (Markus, 2013). Moreover, the linguist has researched the development of children's language, which is particularly important in pedagogy (Markus, 2018; Markus & Vulāne, 2015).

Comprehensive attention has been given to Latvian language didactics by Zenta Anspoka (Anspoka, 2008; Anspoka & Tūbele, 2016) for the primary school stage and Diāna Laiveniece (2003) for older students, but there is a lack of interdisciplinary research focused on specific language aspects, such as morphology and its acquisition in schools.

Current study

Although the significance of morphology has been studied, it is essential to know the latest research in this field, not only that related to the English language. The more languages considered, the more comprehensive results are obtained, which can also be applied to the Latvian language. Given the limited interdisciplinary research addressing aspects such as morphology and its acquisition in the Latvian language, such a study is essential.

Considering that, unlike Latvian, word formation is regarded as a component of morphology in many other languages, this distinction will not be made in this article. It will determine how the term "morphological awareness" is interpreted in the analysed articles to conclude from this perspective.

However, the main research question is: What role does morphological awareness have in understanding and using one's native language? This question will serve as a good starting point for further exploration of students' morphological competence development.

Methodology

A systematic literature review was conducted to achieve this study's goal. In this review, database searches were carried out in line with a systematic review approach (Grant & Booth, 2009).

The articles were selected in the *Scopus* database using the keywords "Morphological awareness and competence." The *Scopus* database is indexed and offers access to various journals. Since the term "morphology" is also relevant to other scientific fields, articles were searched within the subject area of "Social sciences."

Table 1 Article selection

Criteria		Justification	Number of articles
inclusion	Scopus database, keywords: morphological competence and/or awareness	Indexed database and offers access to a wide range of journals	1052 ↓
	Articles published between 2003 and 2024.	The chosen period is a broad timeframe, allowing for a comprehensive overview of recent and older studies.	274 ↓
	Articles in English.	To avoid misinterpretation.	
	Open access articles.	To access and read the entire article.	
exclusion	It is not related to language morphology.	The term “morphology” is relevant to other scientific fields as well.	86 (reading titles) ↓ 23 (reading abstract or full text)
	It is not related to native language acquisition.	Many studies (Yuan & Tang, 2023; Matwangsang & Sukying, 2023, etc.) examine morphology’s role in foreign language acquisition, highlighting its heightened importance in second language learning. However, given the author’s specific interest in native language development, criteria for exclusion were implemented accordingly.	
	Language not belonging to the Indo-European language family.	Since Latvian (the focus of the author’s interest) belongs to the Indo-European language family, related languages were selected.	
	Not focusing on school-aged children.	The author’s research interest lies in school-aged children and educational didactics.	
	Only focusing on students with learning disabilities (e.g., dyslexia).	The approach to teaching and material perception differs for children with learning disabilities. This review aims to demonstrate the general pattern.	

Using the inclusion criteria, the search resulted in 274 articles. A qualitative review of all abstracts was further performed to narrow down the most relevant material for analysis, and exclusion criteria were developed. Using this selection process, initially, by only reading the titles of the articles, 86 articles were selected. After reading the abstract or the entire article, 23 articles were chosen for this study. All criteria, their rationale for development and a sequential overview of article selection can be found in Table 1.

After selection, articles were organised in a table, focusing on the purpose, definition of morphological awareness, analysed language, type of study, age of participants, and main results and conclusions. All the articles were analysed using thematic analysis, as themes were identified within them to evaluate the role of morphological awareness.

The selected articles primarily focused on English language morphology (14), with additional research conducted on the German language (3), Portuguese (2), as well as French, Dutch, Spanish, Norwegian, and Danish. Most of the studies were quantitative (17), utilising regression analysis to determine the correlation of morphological

awareness with various language usage domains. Six articles were qualitative studies involving literature analysis. In the quantitative studies, the total number of participants was 3741. The age range of participants was from 5 to 19 years old (from preschool to the end of secondary school), with 2749 participants aged 9 to 11 years old, indicating that this age group is studied the most in the context of morphological acquisition.

Results

Firstly, it was clarified that in all the selected articles, “morphological awareness” was defined as the ability to recognise, understand, and use morphemes to understand or create words (Apel, 2014), indicating that morphemics, morphology, and word formation are not differentiated.

Following a thorough analysis of the articles, four themes related to the impact of morphological awareness were identified: reading (16 articles), writing (8 articles), vocabulary (5 articles), and pronunciation (2 articles). Following a thorough analysis of the articles, four themes related to the impact of morphological awareness were identified: reading (16 articles), writing (8 articles), vocabulary (5 articles), and pronunciation (2 articles).

Reading

The role of morphological awareness in reading was most extensively studied. The term “reading” encompasses reading comprehension (7 articles), literacy skills (3 articles), word reading accuracy and fluency (4 articles), and reading ability (2 articles).

Studies involving students of various ages demonstrate that morphological awareness significantly influences reading proficiency. Particularly crucial is the age range from 6 to 13 years old, although a positive impact is observed across all age groups (Lázaro et al., 2015; Carlisle, 2003; Haase & Steinbrink, 2022; Görgen et al., 2021; Levesque et al., 2019; McCutchen et al., 2014; James et al., 2021; Tong et al., 2014). Additionally, morphological learning most prominently enhances students’ reading proficiency, initially performing at lower levels (Bowers et al., 2010).

In early childhood – in preschool and elementary school – morphological awareness aids in learning to read based on well-developed oral language skills. Morphological awareness significantly predicts word reading accuracy and speed, pseudoword reading accuracy, text reading speed, and reading comprehension (Kirby et al., 2012). Joanna Carlisle (2003) initially points out that morphological knowledge is often perceived as self-evident, as most children seem capable of expressing themselves clearly and accurately. Therefore, mastery of grammar and morphology is not an instructional goal. Additionally, a belief exists that a common but perhaps mistaken view is that derivations are too complex for children or are not crucial for children’s literacy development until middle school. As the researcher indicates, an understanding of morphemes helps to grasp words as a whole and pronounce them correctly, and attention should be paid to them from an early age (Carlisle, 2003).

Meanwhile, other studies indicate that the role of morphological understanding in developing reading skills changes as students grow older. Reading instruction in the early years (preschool and primary school) promotes morphological understanding, whereas, in later years, the opposite process is observed – morphological understanding helps better comprehend the text (Inoue et al., 2023; Lee et al., 2023; Hasan et al., 2022, Kristensen et al., 2023) because the ability to recognise morphemes in words is directly linked to understanding the meaning of the word.

One of the essential aspects of word comprehension is the ability to determine its prime word (the original word from which the given word was derived), which is a significant component of morphological understanding. A study on the Portuguese language indicates that this ability was observed in children around the age of 9; younger children typically couldn't determine the prime word in most cases. Determining the prime word and recognising morphemes also play a significant role in spelling (Rosa & Nunes, 2008).

To summarise, morphological awareness greatly influences reading proficiency across various age groups, with its significance evolving throughout schooling. Early education emphasises its role in reading acquisition, while later years highlight its importance in comprehension and spelling skills, underscoring its pivotal role in literacy development.

Writing

It is natural for reading to be closely linked to writing, so knowledge of morphology also influences writing skills. The impact of morphological awareness on writing skills has been described in 8 articles. This is particularly important in languages with deep orthography, such as English (Carlisle, 2003; Lee et al., 2023; Kristensen et al., 2023). In languages with shallow orthography (such as German), morphological understanding plays a more significant role in primary school, starting around the 4th grade, when more complex words are used (Weiss et al., 2010; Haase & Steinbrink, 2022). This supports the idea that individuals gain more experience with literacy, and their morphological awareness becomes increasingly important. This heightened awareness becomes crucial once they have mastered the connections between phonemes (individual sound units) and graphemes (written symbols) in a language. When a person reaches a level where correct spelling depends on understanding larger written language units, such as morphemes, their morphological awareness becomes a key factor. This implies that a deeper understanding of the structure and meaning of words, beyond individual sounds and letters, is essential for accurate spelling (Görge et al., 2021).

The results of the experimental study confirmed that intensive morphological instruction positively impacted the spelling abilities of 9–10-year-old children in English. The most significant improvement was demonstrated by those students who initially had poorer spelling results (McCutchen et al., 2014). The same is confirmed by a study involving high school students, where the instruction length was 2–3 weeks (Weiss et al., 2010).

This indicates that knowledge of morphemes enhances understanding of word spelling (as with reading). A similar result was also described in a study on the French language. Children of the same age were involved in the study, and after using appropriate morphological methodology, students' spelling performance significantly improved. Notably, the acquired knowledge enabled students to use it in new situations as well. Specifically, the words used in the learning process were spelt correctly, and morphemes were also recognised in other, less familiar words, facilitating their accurate transcription (Ardanouy et al., 2023). In all the mentioned studies, students successfully used the learned morphemes in word creation, which is crucial for expanding vocabulary.

Morphological knowledge significantly influences writing skills, particularly in English with deep orthography. In primary school, understanding morphemes becomes more crucial as complexity increases, aiding spelling accuracy. Intensive instruction enhances spelling abilities, especially for students initially struggling with spelling. This understanding also aids word creation and vocabulary expansion.

Vocabulary

As mentioned, vocabulary is tightly connected with reading comprehension, word derivation, and creation. This is why vocabulary expansion is another aspect where morphological understanding plays a significant role.

Five articles discuss the relationship between vocabulary and morphological understanding. Morphological understanding helps in forming words and incorporating them into one's lexicon (McCutchen et al., 2014; Spencer et al., 2015; Kristensen et al., 2023; Inoue et al., 2023; Zhang et al., 2023). Students' morphological understanding is reflected in their precision in formulating thoughts using words with corresponding affixes (Spencer et al., 2015).

Similarly to the results of the previously described studies, the significance of morphological understanding regarding vocabulary also changes with students' age. The correlation between morphological understanding and vocabulary is lower in the younger grades. The older the child, the more morphological understanding and awareness influence vocabulary (Zhang et al., 2023).

The presence of morphological awareness as an additional dimension of vocabulary comprehension suggests that effective morphological teaching and intervention could directly impact vocabulary growth. Consequently, comprehensive vocabulary instruction should encompass a morphological element (Spencer et al., 2015).

So, students' ability to formulate thoughts accurately with corresponding affixes reflects their morphological understanding, emphasising its importance in vocabulary development across different age groups.

Pronunciation

It is not easy to separate the term *pronunciation* from the *word reading accuracy*, but morphology affects how the word is pronounced. This aspect of morphological awareness has been pointed out in two reviewed articles (Lee et al., 2023; Kristensen et al., 2023).

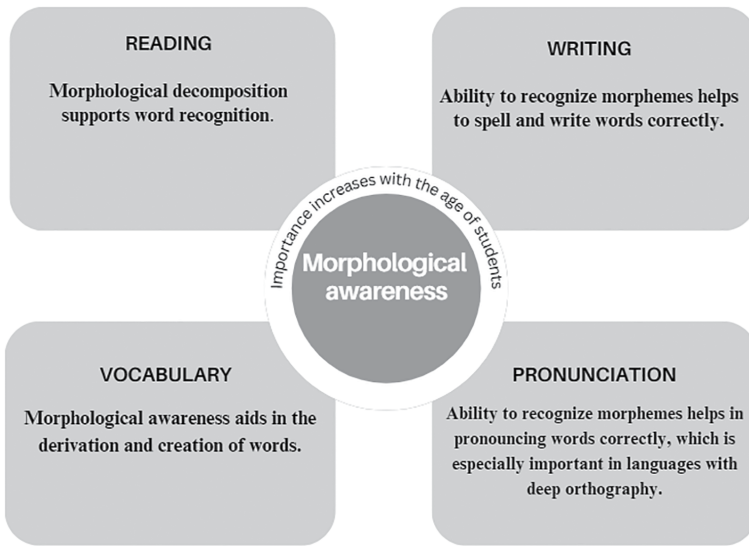


Figure 1 Domains impacted by morphological awareness

Languages featuring morphophonological writing systems prioritise conveying morphological information over phonological details. Consequently, in such writing systems, knowing phoneme-grapheme correspondences is often insufficient; instead, morphological awareness becomes crucial. English serves as an illustration of a morphophonological writing system. For instance, the word “react” is pronounced as re-act /riækt/, where the morphological structure is maintained rather than interpreting “ea” as a vowel team and pronouncing it as /ri:kt/ (Lee et al., 2023). This example demonstrates how morphemes can affect pronunciation.

The fact that morphological decoding (the decoding process involves breaking down words into their constituent morphemes) can enhance word reading accuracy is also concluded in the study on Norwegian (Kristensen et al., 2023).

Morphology plays a crucial role in pronunciation. In English, where morphological structures influence pronunciation, morphological decoding can significantly improve word reading accuracy.

The identified themes within the articles in which morphological awareness is significant, and the main results of this review are depicted in Figure 1.

Discussion

The analysis revealed that the definition of morphological awareness, as used in the analysed articles, differs from that of Latvian grammar. Parts of speech, grammatical categories, and their paradigms (which are highly significant and complex components of Latvian morphology, as it is a fusional language with diverse grammatical inflections) are not examined in this study, as the focus of the research, as reflected in

selected articles, is on recognising, understanding and using morphemes to understand or create words. As mentioned, word composition is viewed in morphemics as a subfield of morphology, whereas word formation in Latvian linguistics is an independent field of linguistics. However, this also has significant importance in learning, as understanding word composition is closely related to parts of speech, which are fundamental to Latvian morphology (Paegle, 2003).

The most analysed language was English, and it is considered an orthographically deep language, where there is a weaker correspondence between the sounds of a language and its written symbols. Consequently, much greater attention is paid to spelling, which is less relevant in Latvian because its correspondence between letters and sounds is much more pronounced. Considering this conceptual difference, this study cannot be attributed to morphology but only to its part from the perspective of the Latvian language. This indicates that it is necessary to explore literature further, paying particular attention to languages more closely related to Latvian or the most closely associated – Lithuanian language, the grammar of which could be more similar.

Summarising the results, two relatively contradictory observations emerge. On the one hand, studies indicate that morphological understanding in early childhood aids in acquiring reading and writing skills (Carlisle, 2003). On the other hand, a substantial amount of convincing research shows that morphological understanding increases with children's age when students consciously begin to recognise and use morphemes. In a study involving elementary and middle school students, the older children demonstrated the best results after morphology lessons (Weiss et al., 2010). This could be a topic for discussion on whether it is essential to learn morphology intensively in primary school or if it could be more effective at the middle school stage. Because positive effects are evident across all age groups, neglecting the significance of morphology instruction would be imprudent. It is also significant that in several experimental studies (Bowers et al., 2010; McCutchen et al., 2014), it was proven that morphology acquisition provides the most positive effect for students with lower academic achievements in reading and writing. This provides evidence that despite morphology often being considered complex, a formal language component with little relevance to practical language use, structured and consistent morphological instruction greatly supports language learning for children who find it more challenging.

However, it is essential to consider that morphology training courses described in the analysed articles were explicitly developed for research purposes, with methods differing from the approach commonly used in schools. Therefore, the question becomes relevant: How can a morphology learning methodology model be created to integrate into everyday school practices easily? Evidence indicates that teaching morphology is more effective when integrated with other aspects of literacy instruction (Bowers et al., 2010) and when utilised consistently (Hendrix & Griffin, 2017). It is also essential to understand that most experimental studies lasted less than ten weeks (Bowers et al., 2010; Weiss et al., 2010), a relatively short and intensive learning period. Despite this, they still yielded positive results: students were better able to recognise morphemes, use them in

forming new words, and better understand or infer the meaning of unfamiliar words by understanding the meaning of morphemes. This indicates that it is worth occasionally focusing more intensively on morphological issues within the integrated teaching model. Therefore, a combined teaching model could yield the best results. Since phonetics, syntax, and lexicology are the fields most closely related to morphology (Kalme & Smiltneice, 2001), it would be natural to address morphological issues when discussing these topics. Additionally, separate, more intensive lessons should be dedicated to studying and reinforcing previously acquired knowledge of morphology.

Conclusions

It can be concluded that morphological awareness plays a significant role in reading, as morphological decomposition supports word recognition. It is also crucial in writing, as recognising morphemes helps with correct spelling and word formation, thereby expanding vocabulary and aiding in the derivation and creation of new words. Furthermore, recognising morphemes contributes to accurate pronunciation, particularly in languages with deep orthography. As students grow older, the importance of morphological awareness increases due to the growing complexity of language use and the greater need for accurate morpheme usage.

Even though the term “morphological awareness” does not align precisely with the traditional divisions of linguistic fields in Latvian, its significance in acquiring the Latvian language remains undiminished. It should be noted that Latvian features a relatively grapheme-sound solid correspondence, which allows learners to benefit from straightforward decoding processes during the early stages of literacy development. However, as students progress, the language’s rich inflectional morphology demands a deeper understanding of word structure. This understanding is crucial for both comprehending and constructing words in Latvian. Developing morphological awareness is essential for mastering advanced literacy skills, particularly writing and comprehension. Recognising the meanings of individual morphemes enables learners to decode unfamiliar words and grasp more complex language concepts, enhancing their overall language proficiency.

Based on the results, morphology should be integrated into the educational process from the early stages of primary school, with increasing intensity and systematic continuation as students grow older and the importance of morphological awareness becomes more pronounced. However, as previously mentioned, additional research is required to determine the most effective age and scope for morphology instruction.

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