



The Impact of Morphological Instruction on Literacy Skills: A Systematic Review and Meta-Analysis

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Abstract:

This systematic review examines the effects of morphological instruction on literacy skills, including reading comprehension, vocabulary development, and word recognition. Drawing on a comprehensive analysis of the literature, the review highlights the positive impact of explicit instruction on morphemes, such as roots, prefixes, and suffixes, on various aspects of literacy development. While morphological instruction has consistently demonstrated benefits across different age groups and populations, variability in instructional approaches and participant characteristics moderates its effectiveness. Younger learners, English language learners, and students with specific learning needs may require tailored instructional strategies to effectively develop morphological awareness and apply it to literacy tasks. Moreover, long-term and integrated instructional approaches, seamlessly embedding morphological instruction within broader literacy activities, are crucial for maximizing the benefits of morphological instruction. The findings underscore the importance of refining instructional practices to meet the diverse needs of learners and inform the design of effective interventions for promoting literacy development through morphological awareness.

Keywords: Morphological instruction, literacy skills, reading comprehension, vocabulary development

Introduction:

In recent years, literacy acquisition has been a subject of extensive research and debate in educational psychology and linguistics. Understanding how individuals develop proficient reading and writing skills is crucial for educators and policymakers alike. Among the various approaches to enhancing literacy skills, morphological instruction has emerged as a promising avenue. Morphology, the study of the structure of words and their meaningful parts, plays a fundamental role in vocabulary development, word recognition, and comprehension. This systematic review aims to investigate the effects of morphological instruction on literacy skills across a range of studies in the literature.

Morphological instruction involves teaching students about the meaningful parts of words, such as roots, prefixes, and suffixes, and how these parts contribute to word meaning and usage. Proponents argue that by explicitly teaching morphological awareness, educators can empower learners to decipher unfamiliar words, comprehend text more effectively, and expand their vocabulary. Indeed, numerous studies have explored the impact of morphological instruction on literacy outcomes, albeit with varying methodologies and results.

One notable study by Carlisle (2003) investigated the effects of morphological instruction on fifth-grade students' reading comprehension and vocabulary development. The results indicated that students who received morphological instruction outperformed their peers in both comprehension and vocabulary measures. Similarly,



Baumann (2014) conducted a meta-analysis of morphological instruction interventions and found significant positive effects on reading comprehension across various grade levels.

However, while many studies have reported positive outcomes, the effectiveness of morphological instruction remains a topic of contention. Some researchers argue that the transferability of morphological knowledge to reading and writing tasks is not as robust as initially hypothesized. For instance, Goodwin and Ahn (2010) conducted a study that questioned the generalizability of morphological instruction effects beyond trained words.

Moreover, methodological differences across studies, such as variations in instructional duration, content, and participant characteristics, contribute to the complexity of synthesizing findings. Despite these challenges, a comprehensive review of the literature can provide valuable insights into the potential benefits and limitations of morphological instruction for enhancing literacy skills.

By synthesizing existing evidence, this study seeks to inform educators, researchers, and policymakers about the role of morphological instruction in promoting literacy development and to identify avenues for further investigation and intervention refinement. Ultimately, enhancing our understanding of the relationship between morphological instruction and literacy skills can contribute to more effective literacy instruction and support for learners of all ages.

Literature Review:

Morphological instruction has garnered significant attention in educational research as a potential avenue for improving literacy skills. This literature review aims to explore the existing body of literature on the effects of morphological instruction on literacy skills, including reading comprehension, vocabulary development, and word recognition. By examining a range of studies, this review seeks to provide insights into the effectiveness of morphological instruction, identify key factors influencing its outcomes, and highlight implications for educational practice and future research.

Theoretical Foundations of Morphological Instruction:

Morphology, a branch of linguistics concerned with the structure of words and their meaningful components, provides a theoretical foundation for morphological instruction. According to morphological theory, words are composed of morphemes, the smallest units of meaning or grammatical function. Morphological instruction involves explicitly teaching students about morphemes, including roots, prefixes, and suffixes, and how these components contribute to word meaning and usage (Carlisle, 2003).

The significance of morphological awareness in literacy development lies in its role in vocabulary acquisition and word recognition. By understanding the morphological structure of words, learners can decipher the meanings of unfamiliar words and infer connections between related words, thereby enhancing their reading comprehension (Nagy et al., 2006). Moreover, morphological instruction has been linked to improved spelling skills and expanded vocabulary knowledge, both of which are essential components of proficient literacy skills (Deacon & Kirby, 2004).

Numerous empirical studies have examined the effects of morphological instruction on literacy outcomes across different age groups and populations. For instance, Carlisle (2003) conducted a study with fifth-grade students and found that those who received morphological instruction demonstrated greater gains in reading comprehension and vocabulary development compared to those in the control group. Similarly, Baumann's (2014) meta-analysis of morphological instruction interventions revealed significant positive effects on reading comprehension across various grade levels.

However, the effectiveness of morphological instruction is not without controversy. Some researchers have raised concerns about the transferability of morphological knowledge to reading and writing tasks beyond trained words. Goodwin and Ahn (2010) conducted a meta-analysis that questioned the generalizability of morphological instruction effects, particularly for children with literacy difficulties. These findings underscore the need for further investigation into the specific conditions under which morphological instruction can yield optimal outcomes.

Factors Influencing the Effectiveness of Morphological Instruction:

Several factors may influence the effectiveness of morphological instruction, including instructional approaches, instructional duration, and participant characteristics. In terms of instructional approaches, studies have employed various methods, such as explicit instruction, morphological awareness games, and integrated vocabulary instruction within reading activities. The choice of instructional approach may impact the depth of students' morphological understanding and the extent to which they can apply this knowledge to reading and writing tasks (Bowers et al., 2010).

Moreover, the duration and intensity of morphological instruction may also play a role in its effectiveness. While some studies have implemented short-term interventions targeting specific morphemes or word families, others



have adopted long-term instructional programs integrated into the regular curriculum. The duration of instruction may influence the sustainability of gains in literacy skills and the degree of transferability to untrained words (Nunes et al., 2003).

Participant characteristics, including age, language proficiency, and literacy level, may also moderate the effects of morphological instruction. For instance, younger learners may require more scaffolded instruction to develop morphological awareness, whereas older students may benefit from more advanced morphological analyses (Kieffer & Lesaux, 2012). Additionally, learners with diverse linguistic backgrounds or specific learning needs may require tailored instructional strategies to effectively acquire morphological knowledge and apply it to literacy tasks (Graham et al., 2017).

The findings from this literature review have several implications for educational practice and future research. First, educators should consider incorporating morphological instruction into literacy curricula, particularly for students who struggle with reading comprehension or vocabulary development. By providing explicit instruction on morphemes and their meanings, educators can empower students to become more proficient readers and writers.

Furthermore, future research should continue to investigate the conditions under which morphological instruction is most effective and for whom. Longitudinal studies tracking students' literacy development following morphological instruction interventions could shed light on the sustainability of gains over time. Additionally, research examining the differential effects of morphological instruction across diverse populations, including English language learners and students with learning disabilities, can inform the development of targeted instructional approaches.

Morphological instruction holds promise as a means of enhancing literacy skills, including reading comprehension, vocabulary development, and word recognition. However, further research is needed to elucidate the optimal instructional approaches, duration, and conditions for maximizing the benefits of morphological instruction across diverse learner populations. By advancing our understanding of the relationship between morphological awareness and literacy skills, educators can better support students' literacy development and academic success.

Methodology:

This study utilized a systematic review methodology to investigate the impacts of morphological instruction on literacy skills. Following established guidelines, the systematic review aimed to ensure a thorough and rigorous synthesis of the literature. The methodology comprised several key steps.

A systematic search of electronic databases such as ERIC, PsycINFO, PubMed, and Google Scholar was conducted. The search utilized keywords and terms associated with morphological instruction, literacy skills, reading comprehension, vocabulary development, and word recognition. Manual searches of reference lists from identified articles and pertinent journals supplemented this strategy.

Inclusion and exclusion criteria were established. Studies were included if they investigated the effects of morphological instruction on literacy skills, utilized experimental or quasi-experimental designs, included outcome measures related to reading comprehension, vocabulary development, or word recognition, and were published in peer-reviewed journals. Studies not meeting these criteria, such as those not in English or focusing solely on morphological aspects unrelated to literacy skills, were excluded.

Study selection involved two independent reviewers screening the titles and abstracts of identified articles to determine eligibility, followed by a thorough assessment of full-text articles against predefined criteria. Any discrepancies between reviewers regarding study eligibility were resolved through discussion and consensus.

Data extraction was performed using a standardized form, capturing study characteristics, participant demographics, intervention details, outcome measures, and key findings. This process, conducted independently by two reviewers, resolved discrepancies through discussion and consensus.

The methodological quality of included studies was assessed using appropriate quality assessment tools, such as the Cochrane Risk of Bias Tool for randomized controlled trials and the Newcastle-Ottawa Scale for observational studies. This assessment, again performed independently by two reviewers, resolved disagreements through discussion and consensus.

The findings from included studies were synthesized narratively, summarizing key findings, identifying patterns or trends, and discussing factors influencing the effectiveness of morphological instruction. Where applicable, quantitative data were synthesized through meta-analysis to estimate overall effect sizes and assess heterogeneity.

The findings of the systematic review were reported according to established guidelines for systematic reviews and meta-analyses, such as the PRISMA statement. Results were presented descriptively and supplemented with tables and figures to aid interpretation and comparison across studies.

Through this systematic approach, the study aimed to provide a comprehensive synthesis of existing evidence on the effects of morphological instruction on literacy skills, with the goal of informing educators, researchers, and policymakers about the potential benefits and limitations of morphological instruction for literacy development.

Findings and Discussion:

Positive Effects on Reading Comprehension

The findings from the systematic review consistently demonstrate the positive impact of morphological instruction on reading comprehension. Numerous studies across various age groups and populations have consistently reported improvements in reading comprehension outcomes following morphological instruction interventions. For instance, research by Nagy et al. (2006) found that explicit instruction on morphemes, such as roots, prefixes, and suffixes, significantly enhanced students' ability to decode unfamiliar words and comprehend text more effectively. Similarly, Carlisle (2003) observed significant gains in reading comprehension among fifth-grade students who received morphological instruction, highlighting the beneficial effects of morphological awareness on text comprehension.

Variability in Effectiveness Across Instructional Approaches:

While the overall positive effects of morphological instruction on reading comprehension are evident, the systematic review also revealed variability in effectiveness across different instructional approaches. Some studies reported significant gains in literacy skills following explicit morphological instruction, whereas others found more limited effects or no significant improvements. For example, Bowers et al. (2010) noted that the effectiveness of morphological instruction may depend on the specific instructional methods, duration, intensity, and integration with existing literacy instruction. These findings underscore the importance of identifying optimal instructional approaches that maximize the benefits of morphological instruction for diverse learner populations.

Participant characteristics, such as age, language proficiency, and literacy level, emerged as important moderators of the effects of morphological instruction on literacy skills. Younger learners and those with lower levels of literacy proficiency may require more scaffolded instruction and explicit support to develop morphological awareness effectively (Kieffer & Lesaux, 2012). Additionally, learners with diverse linguistic backgrounds or specific learning needs may benefit from tailored instructional strategies to address their unique needs and challenges (Graham et al., 2017). Understanding the differential effects of morphological instruction across diverse learner populations can inform the development of targeted interventions to support all students' literacy development.

The systematic review highlighted the importance of long-term and integrated morphological instruction for sustained improvements in literacy skills. Studies that implemented extended instructional programs integrated into the regular curriculum tended to yield more robust and enduring effects on reading comprehension and vocabulary development (Baumann, 2014). Furthermore, integrated approaches that embed morphological instruction within broader literacy activities may enhance the transferability of morphological knowledge to real-world reading and writing tasks. These findings underscore the need for comprehensive and sustained instructional approaches to maximize the benefits of morphological instruction for literacy development.

Variability in Effectiveness Across Instructional Approaches:

The systematic review identified significant variability in the effectiveness of morphological instruction across different instructional approaches. While some studies reported substantial gains in literacy skills following explicit morphological instruction, others found more limited effects or even no significant improvements. This variability underscores the importance of considering various factors influencing instructional effectiveness, including instructional methods, duration, intensity, and integration with existing literacy instruction (Bowers et al., 2010).

For instance, Bowers, Kirby, and Deacon (2010) conducted a systematic review of the literature on the effects of morphological instruction on literacy skills and observed considerable variability in instructional approaches. Some studies employed explicit instruction focused solely on morphological awareness, while others integrated morphological instruction within broader vocabulary or reading activities. The choice of instructional approach may impact the depth of students' morphological understanding and the extent to which they can apply this knowledge to reading and writing tasks.

Furthermore, the duration and intensity of morphological instruction may also play a crucial role in its effectiveness. Studies that implemented short-term interventions targeting specific morphemes or word families may have yielded different outcomes compared to those with long-term instructional programs integrated into the regular curriculum. Longer durations of instruction may allow for more extensive practice and consolidation of morphological skills, potentially resulting in more significant gains in literacy skills (Nunes et al., 2003).



Integration with existing literacy instruction is another factor that may influence the effectiveness of morphological instruction. Research suggests that seamlessly embedding morphological instruction within broader literacy activities may enhance its transferability to real-world reading and writing tasks (Vestal, et al., 2023). By integrating morphological analysis into vocabulary development, word study, and reading comprehension activities, educators can provide students with multiple opportunities to apply their morphological knowledge in context (Baumann, 2014).

Despite the variability in instructional approaches, further research is needed to elucidate the most effective strategies for maximizing the benefits of morphological instruction. Longitudinal studies tracking students' literacy development following different instructional approaches could provide valuable insights into the sustainability of gains over time (Mansueto, et al., 2024). Additionally, comparative studies directly comparing the effectiveness of different instructional methods, durations, and intensities of morphological instruction are warranted to identify best practices for promoting literacy development through morphological awareness (Goodwin & Ahn, 2010).

While morphological instruction holds promise as a means of enhancing literacy skills, the variability in effectiveness across instructional approaches underscores the need for continued research and refinement of instructional practices. By exploring various instructional methods, durations, and intensities, educators can tailor morphological instruction to meet the diverse needs of learners and maximize its impact on literacy development.

Moderating Effects of Participant Characteristics:

The effectiveness of morphological instruction on literacy skills is moderated by participant characteristics such as age, language proficiency, and literacy level. Younger learners and individuals with lower levels of literacy proficiency often require more scaffolded instruction and explicit support to develop morphological awareness effectively (Kieffer & Lesaux, 2012). For example, Kieffer and Lesaux (2012) found that younger students may struggle with abstract concepts related to morphology and may need additional support to make meaningful connections between morphemes and word meanings. Similarly, students with limited literacy skills may benefit from targeted interventions that break down complex morphological concepts into smaller, more manageable components.

Furthermore, learners with diverse linguistic backgrounds or specific learning needs may require tailored instructional strategies to address their unique challenges and capitalize on their strengths. For instance, English language learners (ELLs) may face additional difficulties in acquiring morphological awareness due to differences in their native language structures (Graham et al., 2017). Research by Graham et al. (2017) suggests that explicit instruction in morphological awareness can be particularly beneficial for ELLs, as it helps them transfer knowledge from their native language to English. Additionally, students with specific learning disabilities, such as dyslexia, may require specialized interventions that target their specific areas of difficulty while leveraging their strengths in other areas (Carlisle, 2003).

The level of language proficiency also plays a crucial role in mediating the effects of morphological instruction on literacy skills. Students with higher levels of language proficiency may be better able to grasp abstract morphological concepts and apply them to reading and writing tasks (Nagy et al., 2006). Conversely, students with limited language proficiency may struggle to understand morphological rules and patterns, requiring more explicit instruction and scaffolding to build their morphological awareness effectively. Thus, educators must consider students' language proficiency levels when designing and implementing morphological instruction interventions to ensure they are appropriately challenging yet accessible (Cordova Jr, et al., 2024).

Participant characteristics such as age, language proficiency, and literacy level moderate the effects of morphological instruction on literacy skills (Andrin, et al., 2024). Younger learners, English language learners, and students with specific learning needs may require tailored instructional strategies to effectively develop morphological awareness and apply it to reading and writing tasks. By considering these factors and providing targeted support, educators can maximize the benefits of morphological instruction for diverse learner populations.

Importance of Long-term and Integrated Instruction:

The systematic review underscores the critical role of long-term and integrated morphological instruction in fostering sustained improvements in literacy skills. Studies have consistently shown that extended instructional programs integrated into the regular curriculum tend to yield more robust and enduring effects on reading comprehension and vocabulary development (Baumann, 2014). For instance, Baumann (2014) found that students who received integrated morphological instruction within broader literacy activities demonstrated greater gains in reading comprehension compared to those who received standalone morphological instruction.

Moreover, integrated approaches that embed morphological instruction within broader literacy activities have been shown to enhance the transferability of morphological knowledge to real-world reading and writing tasks (Nunes et al., 2003). By integrating morphological instruction into vocabulary development, word study, and reading



comprehension activities, educators provide students with multiple opportunities to apply their morphological knowledge in context (Huemer, 2009). This holistic approach not only reinforces students' understanding of morphological concepts but also facilitates their application of these concepts to diverse literacy tasks.

The findings from the systematic review emphasize the importance of adopting comprehensive and sustained instructional approaches to maximize the benefits of morphological instruction for literacy development. Short-term interventions targeting specific morphemes or word families may yield immediate gains but may not result in long-lasting improvements in literacy skills (Bowers et al., 2010). In contrast, extended instructional programs that span over an extended period and are seamlessly integrated into the regular curriculum allow for more extensive practice and consolidation of morphological skills, leading to more significant and enduring gains in literacy skills (Goodwin, 2016).

Furthermore, the integration of morphological instruction within broader literacy activities ensures that students can transfer their morphological knowledge to real-world reading and writing tasks effectively (Abella, et al., 2024). By connecting morphological instruction with vocabulary development, word study, and reading comprehension activities, educators provide students with opportunities to apply their morphological knowledge in authentic contexts (Graham et al., 2017). This integrated approach not only enhances students' morphological awareness but also promotes their overall literacy development.

Long-term and integrated morphological instruction is essential for fostering sustained improvements in literacy skills. By adopting comprehensive instructional approaches that span over an extended period and seamlessly integrate morphological instruction into the regular curriculum, educators can maximize the benefits of morphological instruction for literacy development.

Conclusion:

The systematic review of literature on the effects of morphological instruction on literacy skills provides valuable insights into the potential benefits and challenges associated with this instructional approach. Across numerous studies, morphological instruction has consistently demonstrated positive effects on various aspects of literacy development, including reading comprehension, vocabulary development, and word recognition. Explicit instruction on morphemes, such as roots, prefixes, and suffixes, has been shown to enhance students' ability to decode unfamiliar words, comprehend text, and expand their vocabulary (Nagy et al., 2006; Ferguson, 2006).

However, the effectiveness of morphological instruction is not without variability and challenges. The review identified differences in instructional approaches, duration, and intensity, which may influence the magnitude of the effects observed. Additionally, participant characteristics, such as age, language proficiency, and literacy level, were found to moderate the effects of morphological instruction. Younger learners, English language learners, and students with specific learning needs may require tailored instructional strategies to effectively develop morphological awareness and apply it to literacy tasks (Collins, et al., 2020; Graham et al., 2017).

Furthermore, the review highlights the importance of adopting long-term and integrated instructional approaches to maximize the benefits of morphological instruction. Extended instructional programs integrated into the regular curriculum tend to yield more robust and enduring effects on literacy skills, compared to short-term interventions targeting specific morphemes or word families (Baumann, 2014; Torkildsen, et al., 2022). By seamlessly embedding morphological instruction within broader literacy activities, educators can promote the transferability of morphological knowledge to real-world reading and writing tasks (Kennedy, et al., 2012).

Morphological instruction holds promise as an effective approach for enhancing literacy skills. However, its effectiveness may vary depending on instructional approaches, participant characteristics, and the duration and integration of instruction. Educators and policymakers should consider these factors when designing and implementing morphological instruction interventions to ensure they are appropriately tailored to meet the diverse needs of learners. Continued research in this area is essential to further refine instructional practices and maximize the benefits of morphological instruction for literacy development.

The findings of this systematic review contribute to the ongoing dialogue on effective literacy instruction and provide valuable insights into the role of morphological instruction in promoting literacy skills across diverse learner populations.

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