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Morphological Awareness and Its Association With Reading Comprehension Among Saudi EFL Learners

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***Abstract*—This study delves into the morphological awareness of Saudi learners of English as a foreign language (EFL) and explores potential connections between morphological awareness and reading comprehension. Through conducted assessments, the research aimed to discern the extent of participants' morphological awareness skills and their reading comprehension capabilities in English. The findings indicate that while the participants demonstrated a reasonable grasp of morphological awareness and reading skills in English, the study did not uncover a significant correlational link between the two domains. This research sheds light on the complexities of morphological awareness and reading comprehension among Saudi EFL learners, emphasizing the need for further investigation into the nuanced interplay between these linguistic competencies.**

***Index Terms*—comprehension, EFL learners, English, morphological awareness, reading**

I. Introduction

The ability to recognize morphemes and words' morphological structure is called morphological awareness (Carlisle, 2010; Kuo & Anderson, 2006). Morphological awareness considers the smallest meaningful elements of language, including prefixes, suffixes, inflectional or derivational morphemes, and base words and affixes. Inflectional morphemes modify base words to signal time, number, or aspect (e.g., eat to eats or paper to papers). Derivational morphemes, on the other hand, change the meanings, word classes, or word clusters of root words (e.g., happy to unhappy or teach to teacher).

Kern (1989) notes that second language learners are less prone to develop automatic word recognition skills compared to native speakers. Consequently, they need to consciously focus on morphological elements. Kuo and Anderson (2006) further indicate that L2 learners who possess knowledge of morphology, including how words are formed using prefixes, suffixes, and roots, tend to have a richer vocabulary and improved reading comprehension. Indeed, Deacon and Kirby (2004) argue that there is a link between morphological awareness and reading comprehension. In other words, morphological awareness may have a direct link to reading comprehension in English. This could be because morphologically complicated words account for 60-80 % of new words in English academic publications (Anglin, 1993; Guz, 2010; Nagy & Anderson, 1984). Empirical research in language acquisition and pedagogy has indicated that morphological awareness plays a crucial role in second language (L2) reading comprehension and vocabulary development (Zhang & Koda, 2012; McBride-Chang et al., 2008). While much of the existing literature has concentrated on children (e.g., Kieffer & Lesaux, 2012), relatively few studies have examined adult L2 learners (e.g., Miguel, 2012; Zhang & Koda, 2012).

The current study differs from earlier research investigating whether an association exists between morphological awareness and reading comprehension among Saudi English as a Foreign Language (EFL) learners. It also studies how well students understand the analytic (also known as morpheme identification) and synthetic (also known as morpheme structure) laws of English word formation. It is an attempt to shed light on a linguistic characteristic and morphological awareness that may be useful in improving students' abilities to comprehend academic texts published in English, hence improving their language learning usage and outcomes. Moreover, it is an effort to develop pedagogical implications that will allow Saudi EFL learners to successfully acquire their foreign language and develop their use of word formation as a facilitative method for improving their reading of English academic materials.

II. Literature Review

A. Morphological Awareness

Morphological awareness is defined as being aware of and having access to the meaning and structure of morphemes in connection to words (Aljuaythin, 2023; McBride-Chang et al., 2005). Morphemes are defined as the smallest units of meaning in language. Similarly, Carlisle (1995, p. 194) defines morphological awareness as "children's conscious awareness of the morphemic structure of words and their ability to reflect on and change that structure." At the word

level, this study is interested in learners' capacity to detect and manipulate morphemes. This broad definition allows us to simultaneously consider learners' knowledge of language derivations and inflections. Understanding prefixes (such as *un-* in *undisciplined* or *pre-* in *preoperational*), suffixes (like *-ation* in *graduation* or *simulation*), and the formation of compound words (for example, *cowboy* and *sunlight*) fall within the scope of derivational morphology. The primary goal of inflectional morphology is to indicate grammatical changes in words (e.g., the s in dogs or the ed in acted are both grammatical inflections).

Morphological awareness comprises two dimensions: morpheme identification awareness and morpheme structure awareness. Morpheme identification is the ability to discriminate between homophones with different meanings. This ability is displayed when a learner recognizes that the flower in the flowerpot is a plant with petals rather than a sack of white powder (flour). Carlisle (2000) highlights that morpheme identification requires learners to deconstruct words into their smallest units of meaning, a skill that often develops earlier than the ability to synthesize morphemes. This differential development may explain why learners perform better in morpheme identification tasks than in structure-focused tasks, as seen in studies such as Shoeib (2017). This component of morphological awareness may aid young language learners in distinguishing between meanings of syllables with similar sounds, allowing for easier language analysis and vocabulary expansion.

In this scenario, morphological awareness entails recognizing that phonologically similar words can have many meanings at the same time. Morpheme identification differs from vocabulary knowledge in that it requires an awareness of the numerous meanings that might be associated with the same spoken morpheme. Connecting a spoken word to its meaning is required for oral vocabulary understanding. Morpheme identification, on the other hand, necessitates the ability to discern between the meanings of two or more morphemes pronounced similarly. Understanding that phonologically similar words can have multiple meanings at the same time.

Morphological structural awareness, the ability to develop new meanings using familiar morphemes, is a second component of morphological awareness. This ability is demonstrated in the examination of children's grammatical knowledge. A learner with morphological structural awareness understands that the renowned concept of more than one wug is represented by the word wugs, which consists of two morphemes (McBride-Chang et al., 2005). This example demonstrates morphological inflectional understanding. Compounding can also demonstrate morphological structural awareness using a derivational understanding of morphology. For instance, a learner who understands treetop as the highest point in a tree can be encouraged to come up with a new name to represent the tree's lowest point. Someone who claims that treebottom is a reasonable phrase for this low place in the tree is demonstrating morphological structural awareness (McBride-Chang et al., 2005). Carlisle (2000) further emphasizes that the ability to construct new words (e.g., treebottom) indicates higher-order cognitive processing, which may develop more slowly than decomposition skills.

B. Reading Comprehension

Several studies have explored Saudi learners' difficulties in EFL reading comprehension, highlighting a range of challenges that impede their progress. Mohammed and Rashid (2019) identify key factors such as limited vocabulary knowledge, ineffective reading strategies, and cultural influences contributing to comprehension difficulties. Their findings suggest that these learners often struggle with understanding texts due to a lack of familiarity with English's linguistic and cultural contexts, which can hinder their ability to engage with reading materials effectively.

Complementing this, Khan et al. (2020) emphasize that poor vocabulary, incorrect pronunciation, and flawed grammar are significant barriers to reading proficiency among Saudi EFL learners. Their research indicates that these linguistic challenges account for over 90% of students' difficulties, suggesting that a strong foundation in vocabulary and grammar is crucial for improving reading comprehension. Additionally, they note that many learners exhibit a slow reading pace, further complicating their ability to process and understand texts in English.

Furthermore, Al Asmari and Javid (2018) reinforce these findings by highlighting that Saudi EFL learners often lack motivation and experience anxiety when faced with reading tasks. This emotional aspect can exacerbate cognitive challenges, leading to reluctance to engage with reading materials (Ely et al., 2000). Gender differences in language processing, as noted by Ely et al. (2000), may also play a role, as males and females often employ different strategies when interpreting texts. This emotional aspect can lead to a reluctance to engage with reading materials, further exacerbating their difficulties. The interplay of linguistic challenges and emotional factors creates a complex landscape for Saudi learners, indicating that effective interventions must address reading comprehension's cognitive and affective dimensions.

C. Morphological Awareness and Reading Comprehension

According to Kuo and Anderson (2006), morphological awareness and reading have a reciprocal and directional relationship; if reciprocal, both morphological awareness and reading contribute to each other's improvement; if directional, morphological awareness leads to reading proficiency, but not the other way around. Graves et al. (2013) suggest that the ability to identify and analyze morphological word families—for example, vulgar, vulgarize, and vulgarization—constitutes a reading skill. It is widely recognized that one of the most significant benefits of morphological knowledge in reading is its contribution to understanding vocabulary meaning.

According to Nagy and Anderson (1984), 60% of unknown words encountered in a book have meanings that can be guessed based on their constituent parts. A reader who understands word production processes better will be more empowered to guess the meanings of these words and puzzle out the text (Nagy et al., 2003).

Various empirical studies have investigated the relationship between morphological awareness and reading comprehension. Deacon and Kirby's (2004) four-year longitudinal study indicated a positive link between morphological knowledge and first-language reading comprehension. In one study, Maag (2007) investigated morphological awareness and its relationship to young adults' first-language reading ability. The study's findings revealed that explicit understanding of morphological awareness helps with reading comprehension. Furthermore, better L1 readers and those with a broader vocabulary range exhibited higher metalinguistic awareness than less skilled readers.

Kieffer and Lesaux (2008) investigated the connection between morphological awareness and English reading comprehension in Spanish-speaking English language learners in the fourth and fifth grades. An experimental task assessed learners' capacity to analyze derived terms while reading. The findings revealed a substantial link between morphological awareness and reading comprehension in fourth and fifth graders, with morphological awareness being a significant predictor of reading comprehension in fifth graders. As a result, the findings supported the inclusion of derivational morphology in the English reading comprehension of Spanish-speaking English language learners.

Deacon et al. (2014) also examined the relationship between morphological awareness and reading comprehension among elementary L2 students. Their findings revealed a bidirectional link between morphological awareness and reading comprehension in children. In other words, boosting learners' morphological awareness increased their reading comprehension, and their reading comprehension development paralleled their morphological awareness progression.

Shoeib (2017) investigated levels of morphological awareness among EFL Saudi university students about both analytic and synthetic aspects of word formation. His study also aimed to explore the relationship between the morphological awareness of EFL Saudi students and their successful reading comprehension. In order to carry out these aims, the researcher administered a modified version of the Morphological Awareness Test (McBride-Chang et al., 2008). The study also utilized a modified version of the Reading Comprehension Test for Smart Choice Learners (Oxford, 2007) as one of its instruments. Findings revealed that students achieved higher average scores on the analytic dimension of morphological awareness than on the synthetic dimension. Furthermore, there was a strong positive correlation between students' overall performance on the analytical aspect of the morphological awareness test and their scores on the reading comprehension test. There is also a positive correlation between students' scores on the synthetic aspect section of the morphological test and reading comprehension. However, it is weaker than that of the first section of the test.

The present study investigates the relationship between morphological structure awareness, morpheme identification, and reading comprehension among EFL learners. The aim is to see how well these morphological awareness scores may predict reading abilities among Saudi EFL learners. This is a first step toward understanding the cognitive components that underpin morphology. Early tutoring in morphological structure awareness or morpheme identification could help learners with reading and/or language comprehension if morphological awareness is a strong predictor of reading comprehension.

III. Methodology

A. Research Questions

1. To what extent are Saudi EFL university learners aware of analytic and synthetic word formation rules?
2. Is there any significant correlation between morphological awareness and successful reading comprehension among Saudi EFL learners?

B. Participants

Participation in this research was determined through voluntary sampling. This approach enhances the validity and reliability of the findings, as it allows only those who are genuinely interested to take part, while those who are not interested can opt out. The researcher distributed the study link to all second-level female students in the Department of English at King Saud University. Second-level students were selected for two main reasons: their proficiency scores from the common preparatory year—completed prior to choosing their majors—could be incorporated into the study, and their responses were likely to reflect their existing English knowledge rather than explicit instruction, since they had not yet taken the required morphology course, which is offered at a later stage.

Initially, 65 students joined the study, but only 32 were selected because they were reported to be in the elementary level of English in the Common year. Their elementary proficiency level is A2 in the Common European Framework of Reference (CEFR). Only elementary students participated in the study because beginners might not have yet acquired morphological awareness, and intermediate might be too advanced for the study. All the participants spoke Arabic as their first language and English as a second language. The average age of the participants ranged from 19 to 20. They were all females due to difficulty accessing the male participants since education in Saudi Arabia is segregated by gender.

C. Instrument and Procedure

Two tests were administered in this study. The first was the morphological awareness test adapted from (McBride-Chang et al., 2005), and the second was a standardized reading comprehension test. The Morphological Awareness Test consisted of two sections: one for morpheme identification and another for morpheme structure.

In the morpheme identification section, there were 12 test items. For each item, the participant was shown two different pictures simultaneously. The participant was then given a word or phrase containing the target morpheme and was instructed to choose the picture that best matched the meaning of that morpheme from the two options. In one test item, for example, the participant was instructed to choose one of two pictures depicting the color blue and blow out some air for the one containing the meaning of the morpheme blue in blueberries.

As for the morpheme structure section, 12 situations were presented in two-to-four-sentence stories. After that, learners were instructed to come up with terms to describe the things or concepts in each situation. 6 of the stories required morpheme compounding answers, while the remaining six required syntactic modifications. This is an example of a compounding item: *In the early morning, when the sun appears on the horizon, it is referred to as sunrise. Similarly, at night, when the moon rises, what term might be used for this event?* The expected answer was *"moonrise*." In addition to the *classic "wugs"* example from Berko (1958), which was incorporated into the current research, another item that necessitated a syntactic response was*: "This is a musical instrument called a hux. Now we have three of them. These are three ————*".

The reading test was taken from the British Council Website. It is prepared especially for A2 level students, which is why it is being chosen for the present study. The test measures ESL/EFL students' ability to understand texts written in the target language. It has a reading passage for elementary EFL learners and two exercises: 8 true-or-false items and four matching items.

The link for the study was sent to all Level Two students in Week 4. The first item in the link asks for their consent. If they select (yes), they can proceed, but if they choose (no), a thank you note will appear to close the link. Those who selected (yes) were taken to the first section of the study, which asked for demographics relating to their age, first language, and proficiency level. The second section included the morpheme awareness test, which had two subsections for morpheme identification and morpheme structure, which were explained above. The third and final section is the reading test explained above. The last step in the study was to import the data into Excel to perform the needed statistical tests.

IV. Results

This section aims to answer the study's two research questions: whether there is a correlation between morpheme awareness and reading comprehension and whether there is awareness of analytic and synthetic word formation rules.

A. Morphological Awareness

This study addresses two aspects of morphological awareness: morpheme identification and morpheme structure. Table 1 below presents some descriptive statistics relating to the total, average, and standard deviation (SD) for both morpheme identification and morpheme structure.

Table 1
Descriptive Statistics Relating to Morphological Awareness

	Totals (percentage)	Average	SD
Morpheme Identification	341 (93%)	21.31	1.3113721705515
Morpheme Structure	269 (63%)	16.81	1.9286515936521

*Expected total is 384

According to Table 1, the participants did roughly well in both morpheme identification and morpheme structure. Nonetheless, by looking closely at the data, they did better in morpheme identification (93%) than in morpheme structure (63%). Indeed, the average for morpheme identification is (21.31), and for morpheme structure, it is (16.81). As for SD, the sample is normally distributed because it is (1.3) and (1.9) for morpheme identification and morpheme structure, respectively.

B. Reading Comprehension

As for reading comprehension, Table 2 below presents the total, average, and SD.

Table 2
Descriptive Statistics Relating to Reading Comprehension

	Totals (percentage)	Average	SD
Reading Test	314 (81%)	19.63	2.1

*Expected total is 384

The participants scored (314) out of (384) in the reading test. This accounts for (81%) correct answers. The average was (19.63), and the SD was (2.1). This shows that they also did well in the reading test.

C. Morphological Awareness and Reading Comprehension

The second research question relates to the relationship between morpheme awareness and reading comprehension. Table 3 below presents some values after running the Pearson correlation test.

TABLE 3
PEARSON CORRELATION COEFFICIENTS BETWEEN MORPHOLOGICAL AWARENESS AND READING COMPREHENSION

Pearson correlation tests	R-value	P value
Morpheme identification and reading	0.2529	.38301
Morpheme structure and reading	0.1331	.650109
Morpheme awareness and reading	0.2332	.422346

The P-Value < .05

Pearson's correlation coefficient was calculated three times in this study to examine the relationships between morphological awareness and reading comprehension, specifically, between morpheme identification and reading, morpheme structure and reading, and overall morpheme awareness and reading comprehension. The results suggest that all three relationships showed weak positive correlations that were not statistically significant, as the P-values in all cases were greater than the threshold of 0.05.

The relationship between morpheme identification and reading yielded an R-value of 0.2529, indicating a weak positive correlation. However, with a P-value of .38301, this relationship was not statistically significant. Similarly, the relationship between morpheme structure and reading produced the weakest positive correlation, with an R-value of 0.1331. This value is the closest to zero among the three relationships, suggesting that the connection between morpheme structure and reading comprehension is weak and nearly negligible. The P-value of .650109 further supports the insignificance of this relationship. Finally, the correlation between overall morpheme awareness and reading comprehension resulted in an R-value of 0.2332, reflecting a weak positive relationship. However, this correlation, like the others, was not statistically significant, with a P-value of .422346.

Overall, these findings highlight that the relationships between morphological awareness (and its components) and reading comprehension, though weakly positive, are not statistically significant in the context of this study. The R values, being relatively close to zero, underscore the weak nature of these relationships, particularly for morpheme structure and reading comprehension.

V. DISCUSSION

Generally, the results showed that the students had a moderate understanding of word formation rules. Nonetheless, the participants had more knowledge of morpheme identification than morpheme structure. They could better recognize and break down complex words into smaller meaningful items than in synthesizing morphemes to form new meanings. According to McBride-Chang et al. (2005), the morphological aspect under question needs to exceed (80%) among the students to be considered a good indicator of vocabulary knowledge. Consequently, knowledge of morpheme structure, where students are expected to produce and synthesize the needed morphological elements, seems weak among the participants. This aligns with Carlisle (2000), who argues that morphological synthesis is a higher-order skill that requires more advanced cognitive abilities than decomposition. These findings align with McBride- Chang et al. (2005) and Shoeib (2017). In both these studies, the participants did better in morpheme identification than in morpheme structure.

As for reading comprehension, the participants' performance correlated with their elementary level. They did roughly well in the reading question, showing that this elementary passage was appropriate to their proficiency level. This finding contradicts with most studies on Saudi EFL learners' reading abilities, such as Mohammed and Rashid (2019), which reported that Saudi learners struggle with reading. This discrepancy may stem from the alignment of the reading passage with CEFR proficiency guidelines, which ensured that the task matched the participants' abilities. If learners are presented with a passage appropriate to their proficiency level, they are expected to do well.

The second research question in this study relates to the relationship between morpheme awareness and reading comprehension. While a couple of studies, such as McBride-Chang et al. (2005), Shoeib (2017), Nagy et al. (2006), and Kieffer and Lesaaux (2012) have reported finding a positive significant correlation between these language aspects, the present study did not find such correlation. This finding can be explained by the fact that the reading abilities of the participants in the present study were moderately high, whereas it was reported to be fair to low in the other studies. Most previous tests focused on selecting passages that were standardized and authentic. However, they did not consider evaluating the passages against the CEFR guidelines for what is expected for each proficiency level. Furthermore, previous studies, such as Nagy et al. (2006) and Kieffer and Lesaux (2012), implemented treatment strategies that enhanced morphological awareness, which may have strengthened the correlation in their findings. Also, the present findings could be explained by the fact that the previous studies of Nagy et al. (2006) and Kieffer and Lesaaux (2012) conducted a treatment strategy where morphological awareness is being enhanced among the experiment group, and that is why a link with reading was traced in the post-tests. However, the present study sought to examine whether a link exists without performing any treatment. As for Shoeib's (2017) study, although it approached the topic exactly like the present study, it identified a positive correlation between morphological awareness and reading comprehension. This

contradictory finding with the present study could be explained by the fact that all the participants in his study were males, while the participants in the current study were females. However, this argument remains preliminary and needs further investigation. The role of gender differences in language processing, as suggested by Ely et al. (2000), may provide a plausible explanation, but further research is needed to confirm this.

VI. Conclusion

The current study sought to investigate Saudi EFL learners' abilities concerning morphological awareness. It also examined whether a link exists between morphological awareness and reading comprehension. After performing the needed tests, the study concluded by suggesting that although the participants had a fair knowledge of morphological awareness and reading in English, it did not identify a correlational relationship between the two. While the study may have examined the problem with valid tests adapted from previous studies, the findings remain preliminary and cannot be generalized because of the small sample size.

A. Pedagogical Implications

Since the participants in this study demonstrated a solid ability to understand and analyze morphemes, it is advisable to continue employing the current teaching strategies in the classroom. These strategies effectively foster morphological awareness at the analytic level, an essential foundation for language development (Kieffer & Lesaux, 2007). However, greater emphasis should be placed on synthesizing and producing morphemes to enhance learners' skills further. Incorporating targeted exercises that encourage students to manipulate and create morphemes could significantly strengthen their ability to form new words and expand their lexicon. Through exposure to rich linguistic input, explicit instruction, such as direct guidance on word formation rules, and implicit teaching could be employed to achieve this goal effectively (Nagy et al., 2006).

Furthermore, while the participants' reading comprehension aligns with their current proficiency levels, additional efforts are needed to elevate their overall English proficiency. Improved proficiency is crucial for enabling learners to comprehend more complex and abstract reading passages, which are often required in academic and professional contexts. Research suggests integrating vocabulary enrichment activities and higher-order reading tasks can facilitate this improvement (Nation, 2001). By implementing scaffolded reading activities that gradually increase in complexity, learners can develop the skills necessary to decode and interpret challenging texts with greater ease.

B. Recommendation for Future Research

Future research can take this issue further by investigating it in a bigger sample and comparing the results of males to females to see whether gender can be a variable concerning morphological awareness and reading comprehension. Future research can also investigate the impact of specific instructional strategies to enhance morphological awareness on reading comprehension outcomes. For instance, explicit morphological instruction has proven effective in enhancing EFL learners' vocabulary knowledge and writing skills (Alsaif & Milton, 2012). Implementing such interventions could clarify their effectiveness in fostering reading comprehension.

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