The Effects of Morphological Awareness on EFL Secondary School Students' Reading Comprehension Skills

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ABSTRACT

This exploratory study examines the impacts of morphological awareness on Saudi female secondary school students' reading comprehension skills. In particular, it examines the effects of increasing students' morphological awareness on their reading comprehension skills. Participants included 58 Saudi female secondary school students, who were divided into an experimental group and a control group. The experimental group was taught using a morphemic analysis strategy during their reading classes, whereas the control group attended their usual reading comprehension classes. Pretests and post-tests were prepared to determine the effect of raising students' awareness of morphological knowledge on their reading comprehension skills. The results indicated a strong positive correlation between the students' morphological awareness and the improvement of their reading comprehension skills in the post-test. The study, therefore, confirms that the direct instruction of prefixes, suffixes and base words is useful and should be emphasised when teaching because it significantly increases students' morphological awareness.

Key words: Reading Comprehension Skills, Morphological Awareness, Morphemic Analysis Strategy, Derivational Awareness

INTRODUCTION

One cogent reason for students' academic success in school is their ability to understand what they read (Ronzano, 2010). Reading plays an essential role in education and life. It is "a very complex process involving many physical, intellectual and emotional reactions" (Abu-Ghararah, 2005, p. 53). It is the main gate through which students enter the world of knowledge and engage mentally and emotionally with all aspects of life. English, as a foreign language (EFL) instruction, has conventionally focused on reading. In Saudi Arabia, the Ministry of Education has tended to focus on students' ability to read fluently and comprehend adequately at all levels, especially at the secondary level. Accordingly, teachers implement various methods to improve students' reading comprehension, such as alphabetic, linguistic, phonics-based, analytic and other balanced approaches (Al-Jarf, 2007). However, Alsamadani (2009) found that many Saudi EFL teachers in schools spent most of the class time practicing silent reading.

Improving students' reading comprehension is among the fundamental aims of English language teaching in Saudi Arabia. For learners, reading is an essential information acquisition skill. Understanding is a necessary process for students because it enables them to comprehend the meaning of any text, whether it is a scientific journal, a textbook, a piece of literature or a course syllabus. Enhancing students'

reading ability, therefore, is a basic element of education. As students advance to the secondary level, they face increased reading expectations, as they tend to read a wide range of texts that increase in difficulty. At this level, students must be proficient and fluent to meet such demands. Lacking this ability is a serious problem for EFL first-grade secondary students because they fail to comprehend their textbooks, which affects their English acquisition. Based on her experience and daily observations, the researcher noticed that miscomprehending complex words in written material led students to waste time and effort during the reading process. In addition, many students may lack the ability to divide words into their meaningful parts due to their inadequate knowledge of morphology.

In addition, some EFL teachers neglect the importance of raising students' awareness of morphological knowledge. Badawi (2019) pointed out that many EFL teachers believe that students can acquire morphological awareness automatically. In other words, teachers prefer not to explain morphological structure explicitly. Badawi also mentioned that morphemic analysis instruction receives no attention because it is not integrated into EFL students' textbooks. Christophe (2011) noted that after secondary school, students suffered from a lack of preparedness for life, especially in reading Moreover, Schmidt (1985) believed that most questions in reading comprehension texts taught in many EFL classrooms

are literal, and students can identify the answers in the text without even understanding the questions or the passages' meaning. This study explores the effects of enhancing students' awareness of the meaning and the structure of derived words as a type of morphology on their reading comprehension skills. It highlights a useful resource to help Saudi EFL students become good readers and attempts to test the effectiveness of raising students' morphological awareness on their reading comprehension skills.

Providing students with explicit knowledge of morphological structure is essential for two reasons. Firstly, it helps learners read and spell any kind of text. Secondly, it plays a primary role in students' vocabulary growth. Therefore, it is necessary to enhance students' explicit knowledge of morphemes through systematic instruction and improve their reading accuracy. This clarifies the necessity of suggesting a method, such as morphemic analysis, for teaching reading that enhances students' ability to comprehend a text's meaning. Antonacci and O'Callaghan (2011) defined morphemic analysis as "a valuable word-learning approach that fluent readers use to determine the meaning of unknown words while they are reading" (p.75). This approach helps students divide words into meaningful parts (e.g. prefixes, suffixes, roots) and examine them. By applying this strategy, students can determine the meaning of unknown words while reading. Fluent readers use this strategy to understand unknown words while they practice reading. Morphemic analysis instruction improves learners' ability to acquire new vocabulary and comprehend texts' meaning. This strategy enables students to determine or infer words' meanings and pronunciation by examining and analysing their constituents (i.e., prefixes, suffixes, and roots). Accordingly, this strategy helps students understand unknown words while reading, which, in turn, improves their reading comprehension skills (Antonacci & O'Callaghan, 2011).

Objectives

This study's objective is to investigate the extent to which explicit instruction in morphological rules increases students' awareness and how their morphological awareness affects their reading comprehension skills. In addition, it is aimed at exploring whether increasing EFL secondary students' morphological awareness impacts their reading comprehension skills.

Research Questions

To achieve the objectives specified above, the following three research questions were formulated:
1. To what extent does awareness of morphological knowledge affect Saudi female secondary school students' reading comprehension skills?
2. To what extent does using direct teaching of morphological knowledge enhance the experimental group's weekly reading comprehension skills rate?
3. To what extent does using direct teaching of prefixes, roots and suffix words raise Saudi female secondary school students' morphological awareness?

Null Hypotheses

Based on the three questions above, the following null hypotheses were derived:
H0₁ There is no statistically significant difference between the mean pretest and post-test scores in terms of the experimental group's derivational (suffix) morphological awareness.
H0₂ There is no statistically significant difference between the mean pretest and post-test scores in terms of the experimental group's decomposition (root) morphological awareness.
H0₃ There is no statistically significant difference between the pretest and post-test scores in terms of the experimental group's prefix morphological awareness.
H0₄ There is no statistically significant difference between the mean score of the experimental group and that of the control group in a derivational (suffix) morphological awareness post-test.
H0₅ There is no statistically significant difference between the mean score of the experimental group and that of the control group in a decomposition (root) morphological awareness post-test.
H0₆ There is no statistically significant difference between the mean score of the experimental group and that of the control group in a prefix morphological awareness post-test.

LITERATURE REVIEW

This section focuses on two important dimensions: reading comprehension skills and morphological awareness. Many EFL teachers seek to improve students' reading comprehension skills. Accordingly, they employ various approaches and techniques to enhance reading skills, such as the alphabetic approach, whole language approach, and word method. Consequently, researchers have performed empirical and theoretical studies to understand reading comprehension skills. Al-Mutawa and Kailani (1994) explained that "reading can be described as the process of extracting meaning from printed or written materials (p. 114)," and Orasanue (1986) highlighted that readers must understand the higher mental process that controls their comprehension of written texts. Moreover, he added that any reading comprehension difficulties can be treated with more practice in decoding.

Furthermore, it is important to match texts to students' reading comprehension levels (Guthrie & Klauda, 2010). Lesaux, Lipka and Siegel (2006) described reading comprehension as a multi-dimensional process that can be affected by a number of factors at various stages. This process involves the reader, the text and reading activities. The factors at the reader level consist of reading and accuracy, speed, background knowledge and vocabulary. In addition, Lesaux, Lipka and Siegel (2006) indicate that reading comprehension difficulties can be attributed to difficulties at the passage level, difficulties at the sentence level and difficulties in forming relationships at the syntactic and semantic levels (p. 1). Yee (2010) asserted that the main purpose of reading is comprehension. Understanding is defined as the growth

and the improvement of ideas that occurs as a person reads. Moreover, the ultimate goal of reading instruction consists of decoding and comprehending passages. Similarly, Cromley (2005) stated that many young adolescent students face reading comprehension difficulties.

Shermila (2006) defined reading as a decoding process and insisted that reading's main aim is the understanding of meaning. In addition, Shermila suggested that silent reading improved comprehension more than oral reading did because the former focuses on comprehension that requires background information, some visual data and predicting strategy, whereas the latter focuses on the pronunciation rather than comprehension (p. 28). Shermila described a comprehension lesson as having two interrelated aspects: thematic (i.e. the lesson's linguistic fabric of ideas) and linguistic (i.e. lexical items and structure). Antonacci and O'Callaghan (2011) claimed that "students need direct and explicit instruction for comprehension" (p. 83). Moreover, they argued that any effective strategy for improving the comprehension process requires teachers to apply the following steps: selecting an appropriate text to model the strategy, showing students how to apply the strategy to the text, ensuring that the text is not too difficult for students and providing them with guided practice and discussion about the use of the selected strategy.

Reading Comprehension Skills

Blachowicz and Ogle (2008) stated that "comprehension is an interest-driven process where the purpose of reading can change over time" (p. 27). Furthermore, they viewed comprehension as a multistep process. They also referred to unique strategies of reading comprehension and suggested that, before reading any text, a reader should preview the text, make predictions about it, set the purpose for reading by asking questions and choose appropriate comprehension strategies. They also outlined some strategies for comprehending text while reading: paraphrasing, integrating new knowledge with the prior knowledge, monitoring and continuing to predict or question. Finally, after reading, the reader must summarise what has been read, form connections between text and knowledge types and check for the fulfilment of the reading's purpose. Dechant (1991) believed that "literal comprehension is the basis of all other higher-level comprehension skills" (p. 430). However, students sometimes find literal comprehension difficult because they lack the vocabulary or terminology necessary to understand the text. Dechant noted that good readers can comprehend a text's organisation, as well as classify, organise, summarise and synthesise what they read.

Higher-Level Comprehension skills

Dechant (1991) stated that good readers must be able to reach the higher levels of comprehension skills. These levels are stated as follows:
1. Literal level: the reader can recognize and recall the basic facts of what he reads.

2. Organisational level: the reader can infer the writer's organization or coherence within the materials.
3. Inferential level: the reader can make predictions and draw conclusions from the text.
4. Evaluation level (critical level): can evaluate the relevancy, reliability, truthfulness, accuracy, validity and logic of what he reads.
5. Appreciative level: the reader can identify the mood, tone, or theme of the text. He can identify the elements of setting, mood, plot, characterization, style and theme.
6. Integrative level: the reader can demonstrate, apply, construct, find solutions, or solve problems in what he reads. (p. 429)

Evaluation and judgment are considered the highest level of critical reading skills, whereas integration and interpretation are regarded as a slightly higher level of processing in which critical readers can draw on background knowledge, predict, infer and make conclusions about what they read (Antonacci & O'Callaghan, 2011; Al Akkawi, 2007). Critical skills for the 21st century include the ability to analyse, evaluate and synthesise information. However, critical reading skills are difficult for struggling readers who lack basic skills such as word identification and fluency.

A Strategic Approach to Comprehension

Mikulecky and Jeffries (2004) claimed that reading comprehension is a useful way to improve general English skills. Moreover, they summarised the following basic strategies readers might use in understanding a text:
1. Previewing what is to be read
2. Using the skimming and scanning technique
3. Using vocabulary knowledge for effective reading
4. Making inferences
5. Identifying paragraphs' topic sentences
6. Identifying organisation patterns
7. Summarising main ideas
8. Thinking critically about the text

Thus, reading can be described as a window through which the reader gains more knowledge and makes contact with other cultures and civilisations. Reading comprehension skills are, therefore, essential to a unique process that helps readers acquire information easily. Thus, to acquire information or meaning from various written texts, good readers should be able to read effectively and rapidly without sacrificing comprehension.

Morphological Awareness

Morphological awareness is an essential venue for comprehension (Kuo & Anderson, 2006). "Having more developed morphological awareness and being better able to identify allomorphs would enable readers to read morphological words more accurately and fluently" (p. 163). Moreover, children acquire inflectional rules at early elementary stages, whereas their attention of derivational and compound rules developed at the elementary level and beyond. Morphological awareness is defined as the consciousness of any morphological process, such as derivation, inflection,

and transparency, which can be independent or incorporated with context (Lee, 2011).

Fromkin, Rodman, and Hyams (2007) indicated that morphological knowledge is divided into two components: free morphemes and bound morphemes. A free morpheme is a single morpheme that constitutes a word, such as a *dog*. In contrast, bound morphemes, such as prefixes and suffixes, cannot stand alone. These morphemes must be attached to the base of the word (e.g., un- and -ed in the word *unstressed*). A derivational morpheme is used to create a new word by changing the word's part of speech or meaning. It is "a morpheme added to a stem or root to form a new stem or word, possibly, but not necessarily, resulting in a change in syntactic category, e.g., the suffix form '-er' can be added to a verb like 'kick' to give the noun 'kicker' (p. 543)." Moreover, adding the morpheme un- to the word *happy* changes its meaning to "not happy". Fromkin et al. (2007) stated that morphological knowledge should consist of knowledge of individual morphemes, their pronunciations, and their meanings. In addition, morphological knowledge requires knowledge of the rules for combining morphemes into complex words. For instance, native speakers of English know that the suffix "-*fy*" can be added to an adjective such as "*ugly*" to form a verb, "*uglify*", or it can also be added to the base "g*lory*" to form the verb "*glorify*".

Abu-Ghararah (2005) mentioned that structural clues such as root (stem) words, compounds, contractions, ending affixes, and syllables permit a reader to read and comprehend any text rapidly because the reader can break the word into smaller elements by recognising the morphemic structures. Furthermore, any structural element should consist of a corresponding sound and meaning. For example, the word "*boys*" consist of the suffix -s, which indicates the plural form, and the root word "boy". Antonacci and O'Callaghan (2011) believed that readers must be able to divide words and recognise their meaningful parts (e.g. prefixes, roots, suffixes) to use them to determine an unknown word's meaning. Moreover, teachers must know how to use the morphemic analysis strategy. In other words, they must explicitly present word parts to students. Thus, teaching instruction should direct students' attention to roots, prefixes, and suffixes, as well as their meanings and functions. However, teachers must consider the students' level and begin with a limited vocabulary.

Explicit Morphological Awareness

Many linguists have investigated the importance of direct instruction in morphology and have learned that it has a strong effect on learners' reading abilities. Shoeib (2017) found that EFL Saudi university students performed better when using inflectional affixes. He mentioned that there was a significant relationship between students' morphological awareness scores and their reading comprehension performance. Thus, the correlation indicates that the students' awareness of word-formation rules affects their reading comprehension success. Alsaeedi (2017) clarified that Saudi EFL learners at Taif city received morphological instruction for six weeks. She proved that explicit morphological instruction

helped students improve their vocabulary knowledge and recommended using morphological instruction as an explicit teaching method in EFL classrooms. Badawi (2019) proved that using morphological awareness instruction was affected by participants' morphological awareness, rather their reading comprehension. He recommended incorporating a section about morphological rules in EFL secondary school textbooks to raise student's morphological awareness.

Duo (2009) explained that morphological processing comprises two areas: explicit morphological awareness and implicit morphological processing. He argued that these areas are learned separately and that most researchers have not paid sufficient attention to children's sensitivity to implicit morphological processing. Children develop implicit morphological sensitivity before developing explicit morphological awareness. In addition, Duo (2009) asserted that morphological awareness is more essential than morphological sensitivity for Chinese children learning to read or to acquire vocabulary. Carlisle (2010) recognised that it is important to distinguish between children's use of morphemically complex words and their awareness of words' morphemic structure. He explained that explicit awareness presents unique manipulations of words and sentences in any task, whereas implicit awareness shows an intuitive consciousness of words' morphemic structure in relation to reading comprehension. Therefore, it is essential to understand children's transition from implicit to explicit awareness. Based on a longitudinal study of morphological awareness, "kindergartners had more limited explicit awareness of morphology than first graders" (p. 469). The study highlighted the fact that morphological awareness was a stronger predicator of second-grade reading comprehension than was phonological awareness, whereas phonological awareness had a significant effect on word analysis performance.

Nunes and Bryant (2006) argued that young students of the English language tend to produce inflectional morphemes (suffixes) for possessive words (e.g. *Adam's ball*), present progressive verbs (e.g. *I am walking*), plurals, past-tense verbs, and third-person singular present-tense verbs. They noticed that children learned derivational morphemes somewhat later and continued to learn about them during childhood. Therefore, explicit instruction in morphemes is a useful method for improving students' reading and spelling. Likewise, Craven (2010) investigated the importance of raising adult ESL students' morphological awareness and found that increasing learners' morphological awareness requires enhancing their understanding of how morphemes combine and are distinct from one another. Therefore, ESL students must receive explicit morphological instruction.

Morphemic Analysis Instruction

Talerico (2007) compared the impact of using morphemic analysis and whole-word meaning methods on students' ability to learn the meanings of prefixes, the meanings of taught prefixed words, and the ability to transfer this knowledge to untaught prefixed words. The study included 75 sixth-grade students divided into two groups: morphemic analysis and whole-word meaning. The morphemic analysis group

performed better than the whole-word meaning group on the prefix measure. This clarifies that explicit instruction on prefixes, which was a component of the morphemic analysis method, affected the outcome of the prefix measure. Thus, the findings proved that using morphemic analysis-based instructions significantly improved students' prefixed-word knowledge level. The morphemic analysis group received direct instruction on prefixes, which enabled them to outperform their peers considerably on prefixed words. Similarly, Ferguson (2006) stated that morphemic analysis instruction positively affected students' vocabulary and reading comprehension skills. He emphasised the importance of applying the morphemic analysis strategy and stated that being able to divide words into their morphemes and identify their meanings directly affects comprehension because knowing the vocabulary items can improve comprehension.

Derivational Morphological Awareness

Over the past decades, many researchershave investigated English derivational morphology in depth. Tyler and Nagy (1987), for example, indicated that there are two distinctive classes of English derivational suffixes: neutral classes that do not change stress or vowel in the attachment word, such as "-*er*", and non-neutral suffixes that change stresses and vowel qualities, such as"-*ity*". Furthermore, a neutral suffix is always attached to an independent word, such as in the word *owner*. Non-neutral suffixes are attached to bound morphemes, such as in the word *quantify*. Thus, neutral suffixes can be easier for children to acquire than non-neutral suffixes, which appear to be more easily acquired in high school. According to Tyler and Nagy, derivational morphology also involves three aspects: lexical semantics knowledge, syntactic knowledge, and distributional knowledge. The researchers concluded that suffixed items were more difficult to learn than non-suffixed items. In addition, students between Grades Four and Eight showed no development in their lexical-semantic suffix knowledge. There was, however, unique growth in the students' syntactic suffix knowledge. Thus, the students were able to distinguish well-formed from ill-formed derivations. Abu-Ghararah (2005) stated that most elementary school reading tasks presented the following common suffixes and prefixes: "*dis-,*" "*in-,*" "*pre-,*" "*re-,*" and "*un-,*" and "*-ion,*" "*-tion,*" "*-ance,*" "*-ent,*" "*-al*" and "*-ly.*"

Morphological Awareness and Reading Comprehension

One of the recent studies explaining the effect of morphological awareness on reading comprehension in Turkey was done by Akulut (2019) who found that morphological instruction had positive effects on students reading comprehension. In another investigation, Memiş (2019) pointed out that the student's morphological awareness has increased significantly from the 5th grade to the 8th grade. In her study, she indicated that EFL learners should use the morphemic-analysis strategy to help students comprehend any text effectively. Moreover, Indonesian linguists from State Islamic Institute of Curup, Bengkulu, recommended that English language teachers should teach morphology inductively and deductively which will contribute to the students' reading and vocabulary level.(Noviyenty, Astuti, Fakhruddin &Morganna, 2019).

Geier (2010) investigated how the features of morphologically complex words affect children's ability to read particular words. Participants who had significant morphological awareness performed better on the complex morphemic word reading task than those with low morphological awareness. In addition, students with higher reading abilities read complex morphemic words more quickly than students with low reading abilities. In the same vein, Goodwin (2010) emphasised that morphological awareness contributed to reading comprehension. Goodwin's study revealed that morphological awareness and phonological recoding affected the reading achievement component. He argued that it is difficult to separate morphological awareness from other areas of linguistic awareness and asserted that morphological tasks should involve phonological and orthographic demands. His research also revealed that morphological awareness played a prominent role in the prediction of reading comprehension for fifth-grade Spanish-speaking English learners, as it helped learners who had oral vocabulary knowledge by supporting reading comprehension and reading vocabulary, which increased learners' oral vocabulary knowledge. Lam (2011) tested the effects of morphological awareness on reading among children who were learning the two languages simultaneously. His results indicated that Chinese EFL learners improved in their derivational and compound awareness in the early school years. He also found that all children's performance on morphological tasks during their school years was enhanced. Moreover, the older children performed better than the younger ones on the morphological measure. Consequently, the effects of morphological awareness on reading comprehension significantly increased with age.

Moreover, the awareness of morphemes seems to play a prominent factor in children's text comprehension. According to Logan (2010), a conscious understanding of morphological rules contributes to the comprehension of syntactically complex academic English sentences. He explained the importance of recognising the morphological structure of word-building for English language learners (ELLs). Furthermore, morphemes have a variety of uses, such as inflection, derivation and compound processes. In his three-year longitudinal study, which included 292 native and non-native English-speaking children, Logan found significant differences between the two groups in terms of comprehension, vocabulary, and word reorganisation measures. His study revealed that native speakers of English outperformed their peers in all cases. Thus, morphological awareness, word reading, and vocabulary had comparable relationships with each other and with reading comprehension for English-only and ELLs. Lee (2011) also indicated a notable relationship between elementary children's morphological awareness and their performance on the literacy components such as word reading, reading comprehension, and spelling. Gomez (2009) stated that the morphological

awareness of ELLs who spoke Chinese or Spanish was influenced by the characteristics of their first language. Although Chinese learners performed better on compound awareness, Spanish learners outperformed them on derivational awareness. Gómez recommended that students be provided with explicit and systematic training on morphological rules, derivational and inflectional roots, and suffixes. Likewise, Wilson-Fowler (2011) administered a study among 214 undergraduate college students and concluded that the morphological awareness factor's structure includes a unidimensional construct for college students. The results indicated that morphological awareness has a stronger effect on spelling only than for word reading and sentence comprehension, but it had an indirect negative effect on reading comprehension.

Farran (2010) revealed that morphological awareness of Arabic was not related to morphological awareness of English in EFL children. He asserted that unique factors led to reading comprehension, such as linguistic, orthographic, cultural, and experiential factors. Farran noted that the prominent morphological factor that affects the structure of words in Arabic is the absence or presence of inflectional morphemes. However, Arabic's inflectional morphemes differ from those of English. Such differences may weaken EFL children's reading comprehension. The study concluded that neither morphological awareness nor phonological predicated reading comprehension in Arabic significantly contributed to English reading comprehension. Similarly, Saiegh-Huddad and Geva (2007) reported no correlation of morphological awareness between Arabic and English.

RESEARCH METHODOLOGY

Design and Participants

To accomplish this study's main objectives, a quasi-experimental design was employed. The study included 58 Saudi female secondary school students distributed equally into two groups: the control group, members of which were taught traditionally, and the experimental group, members of which were provided with explicit instructions on morphological knowledge and taught using the morphemic analysis strategy.

Instruments

The researcher employed four tools to achieve the study's objectives, including 45-minute pretest and post-test on the morphological structure and reading passages. In addition, an attitudinal questionnaire was used to collect the students' opinions about what was taught concerning morphemic analysis and to determine whether the students were motivated to learn morphological rules. The questionnaire consisted of seven statements ranked on a five-point Likert scale and was administered to 29 students in the experimental group at the end of the experiment. Weekly reading comprehension quizzes, were adapted from Sorbi (2010), were administered along with a teacher's guide, which provided the teacher with a detailed description of the students'

awareness of reading comprehension and its techniques, such as skimming, scanning, and inferences, as well as the students' awareness of elements of English morphology such as prefixes, roots, and suffixes.

Validity and Reliability

To ensure validity, the questionnaire and tests were evaluated by a group of experts in the field of English language teaching. Pretest and post-test reliability were computed by using the test-retest method. The researcher applied the pretest and post-test with a sample of forty students. The same tests were administered again after two weeks. Thereafter, the correlation between the scores of students at the two applications was computed. For the morphological awareness test, the correlation coefficient (reliability coefficient) r was 0.87, which indicated acceptable reliability. For the reading comprehension test, the correlation coefficient (reliability coefficient) r was 0.92, which indicated acceptable reliability.

Data Collection and Analysis

The data were obtained from the pretest and post-test of morphological awareness and reading comprehension skills, weekly quizzes, and questionnaires. The study applied many statistical procedures to examine the effects of morphological awareness on students' reading comprehension skills in Saudi female secondary school. Statistical Package for the Social Science (SPSS) software was used to analyse the collected data. An independent sample t-test and a paired sample t-test showed the differences between the experimental and control groups and compared the mean of difference in scores between the means from the two tests.

RESULTS AND DISCUSSION

At the beginning of the study, two groups were compared to ensure they were homogeneous regarding their reading skills.

This study emphasised the effectiveness of enhancing morphological awareness on Saudi female secondary school students' reading comprehension skills. The experimental group was exposed to morphological knowledge training in their reading comprehension classes, but the control group was taught in the traditional way. The findings are discussed below.

Effect of Morphological Awareness on Reading Comprehension

The first research question addressed the effects of the students' morphological awareness on their reading comprehension skills. This question was answered based on the students' performance on the reading comprehension skills test. The data obtained from the experimental group's post-test revealed that the students' morphological awareness positively affected their reading comprehension skills. In addition, the experimental group scored higher on the reading

comprehension skills post-test than the control group did. The students who were taught the basic elements of word parts during reading classes (i.e. prefixes, roots and suffixes) demonstrated a significant difference in their reading skills post-test compared to students who attended traditional reading comprehension classes. These results indicated that the experimental group surpassed the control group in the post-test. The experimental group's students achieved significantly better performances in the reading comprehension post-test than the pretest. Thus, the experimental group outperformed their peers of the control group in reading comprehension skills after the training. This finding is in line with Shoeib (2017), who stated that students' awareness of word-formation rules affects their reading comprehension.

Table 2 indicates that the mean score of the experimental group is higher ($M = 5.54$, $SD = 1.5$) than that of the control group ($M = 2.45$, $SD = 1.22$), according to the results of t-test [$t(56)= 0.96$, $p =.000$), this difference is statistically significant. The data obtained from the post-test of the experimental group revealed that the students' morphological awareness positively affected their reading comprehension skills. Thus, the experimental group outperformed their peers of the control group in reading comprehension skills after the training.

Table 3 shows that the mean score of the experimental group is ($M = 5.54$, $SD = 1.5$) whereas the mean score of the control group is ($M = 2.79$, $SD = 0.97$), according to the results of t-test [$t(56)= 0.96$, $p =.000$)]

Results indicates that there was a significant progress from pretest to post-test in the reading comprehension skills of the experimental group after raising students' morphological awareness. The students who were taught the basic elements of word parts during reading classes (i.e., prefixes, roots, and suffixes) demonstrated a significant difference in their reading skills post-test when compared to students who attended traditional reading comprehension classes. The results proved that the experimental group surpassed the control group in the post-test. The experimental group's students achieved significantly better performances in the reading comprehension post-test than the pretest. Thus, the experimental group outperformed their peers of the control group in reading comprehension skills after the training. Ferguson (2006) investigated whether morphemic analysis instruction improved learners' ability to acquire new vocabulary and comprehend the meaning of texts. He noted that instruction in morphemic analysis positively affected students' vocabulary and reading comprehension skills, and he emphasised the importance of applying the morphemic analysis strategy. He argued that being able to divide words into their morphemes and identify their meanings is a useful strategy that helps struggling readers understand words' meanings. Because vocabulary affects comprehension directly, improving vocabulary can improve comprehension (p. 25).

Explicit Morphological Knowledge

The aim of the second research question is to determine whether providing students with direct teaching of morphological knowledge enhances their weekly reading comprehension skills rate.

Table 1. Results of homogeneity test

Group	n	*M*	*SD*	*t*	df	*p*
Control	29	3.04	0.78	0.96	56	> .05
Experimental	29	2.79	0.99			

Significant when $p < .05$. As Table 1 shows, even though the mean score of the control group is slightly higher ($M = 3.04$, $SD = 0.78$) than that of the experimental group ($M = 2.79$, $SD = 0.99$), according to the results of t-test [$t(56)= 0.96$, $p > .05$], this difference is not statistically significant. Thus, there was homogeneity between the experimental and control groups in the pre-measure of reading comprehension before the morphemic structure treatment.

Table 2. Independent sample *t*-test for the significance of the difference between the average reading comprehension post-test scores in the experimental and control groups

Group	n	*M*	*SD*	*t*	df	*p*
Control	29	2.45	1.22	7.59	56	.000
Experimental.	29	5.54	1.5			

Significant when $p < .05$

Table 3. Paired-sample *t*-test for the significance of the difference between average (mean) pre- and post-measure reading comprehension scores in the experimental group

Measure	n	*M*	*SD*	*t*	df	*p*
Pretest	29	2.79	0.97	8.5	56	.000
Post-test	29	5.54	1.5			

Significant when $p < .05$

Table 4 shows that the mean score of the control group on quiz 1 is ($M = 5.9$, $SD = 2.33$), and on quiz 2 is ($M = 5.4$, $SD = 3.53$), whereas the mean score of the experimental group on quiz 1 is ($M = 7.4$, $SD = 1.64$), and on quiz 2 is ($M = 6.8$, $SD = 2.34$), according to the results of t-test [$t(56)= 0.96$, $p > .05$], this differences are not statistically significant. The results proved that providing students with direct instruction of morphological aspects did not affect the experimental group at the beginning of the treatment. After five weeks of teaching morphological knowledge, the experimental group's mean scores on quiz 4 is *($M = 7$, $SD = 1.6$) whereas the mean score of the control group on the same quiz is ($M = 5.68$, $SD = 1.8$)* according to the results of t-test [$t(56)= 0.96$, $p < 0.05$]. This data analysis revealed that the experimental group did better in the last weekly quizzes than the control group did. Providing students with direct teaching of morphological knowledge enhances their weekly reading comprehension skills rate. Therefore, using direct teaching of morphological knowledge positively affected the experimental group's EFL reading comprehension skills rate.

The aim of the third research question is to determine whether providing students with direct teaching of prefixes, roots, and suffixes raised their morphological awareness.

Table 5 shows that the mean score of the experimental group is ($M = 22.2$, $SD = 2.8$), whereas the mean score of the control group is ($M = 8.7$, $SD = 3.1$), according to the results of t-test [$t(56)= 0.96$, $p =.000$]. the result obtained from the morphological awareness post-test indicates that there is statistically significant difference between the mean scores of

Table 4. Independent sample *t*-test of the experimental and control groups' weekly quizzes

Weekly quizzes	Group	n	*M* (out of 10)	*SD*	*t*	*p*
Quiz 1	Control	29	5.9	2.33	56	0.11
	Experimental	29	7.4	1.64		
Quiz 2	Control	29	5.4	3.53	56	0.31
	Experimental	29	6.8	2.34		
Quiz 3	Control	29	5.93	1.92	56	0.05
	Experimental	29	7.17	1.64		
Quiz 4	Control	29	5.68	1.8	56	.000
	Experimental	29	7	1.6		
Quiz 5	Control	29	5.89	1.9	56	0.05
	Experimental	29	7.93	1.8		

Significant when *p* < .05

Table 5. Independent samples *t*-test of morphological awareness post-test

Measure	n	*M*	*SD*	*t*	df	*p*
Control	29	8.7	3.1	15.33	56	.000
experimental	29	22.2	2.8			

Significant when *p* < .05

the experimental group and their peers of the control group. Therefore, using direct instruction of basic elements of words (i.e., prefixes, roots, and suffixes) significantly raised students' morphological awareness in the experimental group. The following null hypothesis are derived from the previous questions.

Effect of Morphological Awareness on Reading Comprehension

The first null hypothesis compared the pretest and the post-test for the experimental group to determine whether using the morphemic analysis strategy had a significant effect.

Table 6 shows that the experimental groups' pretest mean score is ($M = 2.33$, $SD = 1.04$) whereas their post-test score is ($M = 5.66$, $SD = 0.86$), according to the results of t-test [$t(56)= 0.96$, $p =.000$)]. This means that there is a significant difference between the pre- and post-measures. The result of testing the first null hypothesis indicated that the experimental group performed significantly better on the derivational post-test measure than the pretest measure after eight weeks of treatment. However, the experimental group's greater performance on the derivational morphological structure post-test indicated that derivational morphological awareness led to better learning outcomes, as it is related to reading comprehension. The second null hypothesis compared the mean scores of the experimental group's decomposition morphological awareness on the pretest and post-test.

Table 7 reveals that the experimental groups' pretest mean score is ($M = 3.5$, $SD = 2.2$), whereas the post-test score is ($M = 8.5$, $SD = 1.41$), according to the results of t-test [$t(56)= 0.96$, $p =.000$)].the results depict a significant difference between the pre- and post- decomposition

tests. The result of testing the second null hypothesis indicated that the experimental group did better on the decomposition post-test than the pretest. The students' ability to decompose the roots of complex words proved that the experimental group was able to guess the meaning of complex words.

Prefix Morphological Awareness

The third null hypothesis evaluated whether students showed an improvement on the prefixed words post-test.

Table 8 indicates that the experimental groups' pretest mean score is ($M = 2.12$, $SD = 0.94$), whereas their mean score in the prefix post-test is ($M = 4.41$, $SD = 1.01$), according to the results of t-test [$t(56)= 0.96$, $p =.000$)]. The result of testing the third null hypothesis indicated that the students performed significantly better on the morphological post-test measure than the pretest measure. The experimental group's performance on the prefixed words post-test proved that teaching students how to analyse prefixed words improved their reading comprehension skills. In addition, the students in the experimental group did better with inflectional affixes than derivational ones, which is in line with the previous studies that clarify that using morphemic analysis-based instruction significantly improved students' prefixed-word knowledge level (Talerico, 2007).

Derivational Morphological Awareness

The fourth null hypothesis focused on the students' derivational morphological knowledge.

Table 9 indicates that the mean score of the experimental group's derivational post-test is ($M = 5.66$, $SD = 0.86$), whereas the mean score of the control group's derivational post-test is ($M = 1.09$, $SD = 0.29$), according to the results of t-test [$t(56)= 0.96$, $p =.000$)]. The result of testing the fourth null hypothesis indicated that there is a significant difference between the mean scores of both groups after the morphological structure treatment in favour of the experimental group. Based on the findings, the experimental group performed better when assessed on the derivational suffixes than the control group. However, this contrasts with Tyler and Nagy's

Table 6. Paired-samples *t*-test for significant differences the between average (mean) pre- and post-measure morphological awareness scores for the experimental group

Morphological awareness	Measure	n	*M*	*SD*	*t*	df	*p*
Part 4 (derivational pre and post)	Pre	29	2.33	1.04	17.8	56	.000
	Post	29	5.66	0.86			

Significant when *p* < .05

Table 7. Paired-samples *T*-test for the significant differences between pre- and post-measures in the averages (mean) of the scores of morphological awareness for the experimental group

Morphological awareness	Measure	n	*M*	*SD*	*t*	df	*p*
Part 5 (decomposition pre and post)	Pre	29	3.5	2.2	11.37	56	.000
	Post	29	8.5	1.41			

Significant when p < .05

Table 8. Paired-samples *T*-test for the significance in the difference between the pre- and post-measures in the averages (mean) of scores of morphological awareness for the experimental group

Morphological awareness	Measure	n	*M*	*SD*	*t*	df	*p*
Part 3 (prefix pre and post)	Pre	29	2.12	0.94	10.72	56	.001
	Post	29	4.41	1.01			

Significant when p < .05

Table 9. Independent sample *t*-test of the decomposition morphological awareness post-test in the experimental and control groups

Morphological awareness	Group	n	*M*	*SD*	*t*	df	*p*
Part 1 (derivational morphological awareness test)	cont.	29	1.09	0.29	23.4	56	.000
	exp.	29	5.66	0.86			

Significant when *p* < .05

Table 10. Independent sample *t*-test of the decomposition morphological awareness post-test in the experimental and control groups

Morphological awareness	Group	n	*M*	*SD*	*t*	df	*p*
Part 2 (decomposition morphological awareness test)	cont.	29	3.95	2.46	8.38	56	.000
	exp.	29	8.5	1.41			

Significant when *p* < .05.

(1987) claim that suffixed items were more difficult to learn than non-suffixed items. Furthermore, students between Grades Four and Eight showed no development in their lexical semantics suffix knowledge.

Decomposition Morphological Awareness

The fifth null hypothesis examined the students' awareness of decomposition morphological knowledge.

Table 10 indicates that the mean score of the experimental group is ($M = 8.5$, $SD = 1.41$) whereas the mean score of the control group is ($M = 3.95$, $SD = 2.46$), according to the results of t-test [$t(56)= 0.96$, $p =.000$].

The results of testing the fifth null hypothesis revealed that the students taught the basic elements of morphological knowledge performed better on the decomposition test than the control group, who were taught using the traditional methodsThe findings are in agreement with Talerico (2007), who proved the effective impact of using

morphemic analysis-based instruction on the morphemic analysis group compared to the whole word meaning group.

Prefix Morphological Awareness

The sixth null hypothesis was computed to calculate the differences between the scores of the experimental and control groups in the prefix morphological awareness post-test.

Table 11 indicates that the mean score of the experimental group is ($M = 4.41$, $SD = 1.01$), whereas the mean score of the control group is ($M = 2.36$, $SD = 1.0$), according to the results of t-test [$t(56)= 0.96$, $p =.000$]. The results showed that the experimental group achieved a higher mean score than the control group did. Thus, The results of testing the sixth null hypothesis depict significant difference in the experimental group's post-test This finding supports Talerico's (2007) claimed that using morphemic analysis based instruction significantly improves students' prefixed-word

Table 11. Independent sample *t*-test of the prefix morphological awareness post-test in the experimental and control groups

Morphological awareness	Group	n	*M*	*SD*	*t*	df	*p*
Part 3 (prefix morphological awareness test)	Cont.	29	2.36	1.0	6.88	56	.000
	Exp.	29	4.41	1.01			

Significant when *p* < .05

knowledge level compared the whole word meaning group by an advantage of two mean points (8%).

CONCLUSION

This study's main findings can be summarised as follows:

1. There was no statistically significant difference between the experimental group and the control group on pretest measures of reading comprehension skills.
2. The experimental group outperformed the control group on the post-test measure of reading comprehension skills.
3. Direct instruction in prefixes, suffixes and base words significantly increased students' morphological awareness.
4. Improved morphological knowledge leads to better reading comprehension skills.

This study's findings affirm the benefits of using the morphemic analysis strategy to improve morphological knowledge. Therefore, the morphemic analysis strategy should be included in Saudi EFL textbooks. Furthermore, teachers should increase students' awareness of morphological knowledge by using explicit instruction in morphological knowledge. Students should be encouraged to read extra materials and develop their reading skills, and they should and given more opportunities to explore and analyse unknown words during reading comprehension classes. Teachers should also focus students' attention on the meanings and functions of various word parts (e.g. suffixes, prefixes and root words).

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