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Mastering English Compounds by Saudi learners(*)

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مستوى إتقان الكلمات المركبة في اللغة الإنجليزية لدى المتعلمين السعوديين

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الملخص

هدفت هذه الدراسة لتقصي مدى اكتساب الطالبات السعوديات للكلمات المركبة في اللغة الإنجليزية، حيث تم تسليط الضوء على فهم أنواع معينة من الكلمات المركبة، وتحديدا المركبات الإسنادية والإضافية والمزجية وذلك استنادًا على مفهومي التركيب المحوري والتركيب غير المحوري. وأُجريت الدراسة على عينة مكونة من (236) طالبة سعودية، وتم جمع البيانات باستخدام استبانة طُلب فيه من المشاركات إعطاء معاني (24) كلمة مركبة دون الرجوع إلى القاموس. وأظهرت النتائج أن (75%) من الإجابات كانت دقيقة. مما يشير إلى أن الطالبات السعوديات لديهن فهم كافٍ للكلمات المركبة في اللغة الإنجليزية. كما أشارت النتائج إلى أن أداء الطالبات كان أفضل في الكلمات المركبة ذات التركيب المحوري مقارنة بتلك ذات التركيب غير المحوري. علاوة على ذلك، أظهرت النتائج مستوى إتقان أعلى لدى الطالبات في الكلمات المركبة الإسنادية والإضافية ذات التركيب المحوري، تلاها الكلمات المركبة المزجية ذات التركيب المحوري، ويعزى ذلك إلى شفافية المعنى في هذه الكلمات.

الكلمات المفتاحية: المرَّكب المزجي، المرَّكب الإسنادي، المرَّكب الإضافي، الاكتساب، المركبات، التركيب المحوري، التركيب غير المحوري.

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Abstract

This study sought to investigate the acquisition of English compounds among Saudi EFL learners. The focus was on the comprehension of particular compound types, specifically subordinative, attributive, and coordinative compounds, by considering the concepts of endocentricity and exocentricity. The sample involved 236 Saudi female students. The data was gathered by using a questionnaire in which the participants were instructed to provide the meaning of 24 compounds without relying on a dictionary. The results reveal that 75% of the responses were accurate. This implies that Saudi EFL learners may have a sufficient grasp of English compounds. The findings indicate that the learners performed better in endocentric compounds compared to exocentric compounds. The findings showed that the learners had a higher level of mastery of subordinative and attributive endocentric compounds, followed by coordinative compounds. This is attributed to the transparency of meaning for endocentric compounds.

Keywords: Coordinate, Subordinate, Attribute, Acquisition, Compounding, Exocentric, Endocentric

Introduction

Various languages exhibit variations in their word formation processes for creating new words. Compounds, for instance, are created by combining existing words. Compounding serves as a morphological process for word formation across various languages, and in English, it is identified as a productive method (Hall, 1992; Booij, 2010). The two primary categories of compounding are recognized as primary and secondary compounds, both forming through diverse mechanisms. Examples include two-noun compounds like "armchair," combinations of a noun with a preceding or following verb (e.g., "cease-fire"), pairings of a verb with a preposition (e.g., "push up"), and instances where a noun is preceded by an adjective (e.g., "blackboard") (Hall, 1992; Dressler, 2006).

According to Plag (2003) and Bisetto and Scalise (2005), compounding is defined as the process of combining two words to generate a new word. Lieber (2016, p. 48) defined compounds in English as “words that are composed of two (or more) bases, roots, or stems”. However, Altakhaineh (2019) proposed that a compound is an intricate word formed by the combination of at least two adjoining words, with the non-head constituent typically being non-referential. On the other hand, Plag (2003, p.135) asserts that compounds consist of two elements: “the first of which is either a root, a word or a phrase, the second of which is either a root or a word". He illustrates that in English compounds, the left element modifies the right element; for instance, "blackbird" implies a bird that is black. There is no universally agreed-upon definition of compounds; thus, Altakhaineh et al. (2023) argued that mastering compounds in this regard might pose challenges for EFL learners.

Ravid and Shlesinger (1995) argued that researching compounding involves pursuing two distinct directions. The first one pertains to the role of compounding within a formal grammar model, particularly its interaction with other processes in morphology and syntax. The key consideration is that compounding entails the syntactic combination of two words, and in this case, it is considered highly productive in generating words. The second direction, which is the descriptive approach in compounding studies, concentrates on the characteristics of the compound constituents and the relationship between them. Ravid and Shlesinger (1995) reported that the studies in this approach

classified compounds into two major classifications. The first classification of compounds is related to the category of compounds: deverbal and root compounds (Lieber, 1983, cited in Ravid & Shlesinger, 1995). The second one considers compounds endocentric and exocentric (Marchand, 1969). In this regard, following Altakhaineh et al. (2023), the present study thrives to explore Saudi EFL learners' mastery of different types of compounds in English.

Literature review

Compounding in English

The compound-phrase distinction, compound internal structure, and compound mechanisms have been subjects of interest for researchers across various languages (Emery, 1988; Spencer, 1991; Katamba, 1993; Bauer, 2003; Plag, 2003; Dressler, 2006; Ryding, 2005; Katamba & Stonham, 2006; Bauer, Lieber, & Plag, 2013; Altakhaineh, 2019, 2022; Altakhaineh et al.; 2023 among others). There are certain criteria that can help to identify compounds from phrases and identify the headedness of compounds in many languages such as spelling, coordination, vowel deletion or harmony, stress, voicing, compositionality, conjunction of the complement, referentiality, semantic idiosyncrasies, etc. (Bauer, 1998, 2009; Aronoff & Fudeman, 2011; Borer, 2009; Fàbregas & Scalise, 2012; Al-Dobaian, 2018; Altakhaineh, 2019). However, no universal measures or principles have been established to reliably distinguish between compounds and phrases. Additionally, the identification of the headedness of compounds is a matter of ongoing debate.

The differentiation between compounds and phrases lacks clear and transparent criteria in many languages, including Arabic. However, Altakhaineh (2019) claimed that adjacency and referentiality are two criteria used in MSA and JA to differentiate between phrases and compounds(1). Emery (1988) and Amer and Menacere (2020) stated that spelling of compounds has no role in identifying compound boundary in Arabic, e.g., ra's maal 'written as two words' and rasmaal 'written as one word' 'literal meaning capital'. English compounds behave in a similar way where the

(1) See Altakhaineh (2019) for more details on the other criteria for distinguishing phrases and compounds.

spelling of compounds has no role in differentiating between compounds and phrases (Bauer, 1983, 1998; Lieber, 2016).

Compounds in English have three different shapes; they are written as one word, e.g., eggplant; others are written as either two words, as egg head, or separated with a hyphen as eye-catching. However, spelling is considered a key role in identifying compounds in other languages such as Dutch (for more details see Booij, 1992). Moreover, languages behave differently in identifying the head of the compound. In some languages, the head of the compound is final (right-headed), as in German, and in others, the head is initial (left-headed), as in Roman languages (Haider, 2001). Additionally, Plag (2003) clarifies that compounds in English are right-headed, meaning that the head of the compound determines the semantic and syntactic function of the entire compound. The head also dictates the grammatical category of the compound, such as "goldsmith" being a noun because the head, "smith," is a noun, and “blue-green” is an adjective because the head, “green” is an adjective.

Lieber (2016) stated that compounds can be classified in many ways based on the headedness of the compound, category, and semantic relationships between the constituents of the compound. He emphasized that compounds are traditionally divided into two categories: deverbal (also called synthetic) and root compounds. Root compounds consist of two words that could be nouns, verbs, or adjectives, e.g., blue-green (adjective - adjective). Synthetic compounds, on the other hand, consist of two words in which the second constituent is derived from a verb, e.g., bus driving, ‘driving’ is derived from the verb ‘drive’, and the first element, ‘bus’, is its argument.

A more refined classification of compounds is possible by considering the semantic relationships that exist between the constituent elements. Bisetto and Scalise (2005)(2) suggested three types of compounds based on grammatical relationships between the compound constituents: coordinative, attributive, and subordinative compounds, as shown in Diagram (1).

(2) Conversely, Bagasheva (2011) argued that the proposed classification system by Bisetto and Scalise (2005) is insufficient in capturing compound verbs because of their complexity. For more details see Bagasheva (2011), the arguments go beyond the scope of this paper.

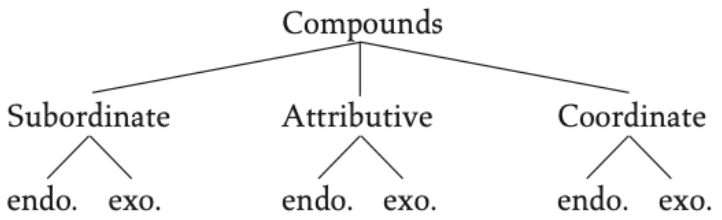

Diagram (1) Compound types

Bisetto and Scalise (2005, 2, p. 326)

A coordinative compound is composed of two components where the second component is not modified by the first component, but rather, both components retain equal significance. The meaning of the whole compound is equally based on the meanings of both base elements, e.g., mother-child. Attributive compounds state that the non-head element serves as a modifier for the head; it expresses the semantic relations between the two elements (i.e., expressing a property of the head), e.g., blackbird. Attributive compounds are composed of an adjective and a noun or two nouns. A subordinative compound is a compound in which one constituent is understood as the argument of another constituent, typically as the object of the argument, street seller, *street* is the complement of the head *seller* (i.e., deverbal). Bisetto and Scalise (2005) stated that each type of three compounds is classified, based on semantic relations of compound constituents and on the headedness criteria, as both endocentric and exocentric. An endocentric compound is characterized as a combination whose meaning can be inferred from the meanings of its components, e.g., a school bus is a kind of bus that takes students from and to school (Lieber, 2016). Conversely, exocentric compounds are those in which the meaning of the compound does not align with the meaning of their head, e.g., a pickpocket is not a pocket but a person who steals things from pockets.

Compounding in Arabic

Emery (1988) argued that a significant debate surrounds the treatment of compounding in Arabic. One perspective, held by some Arab grammarians, considers compounds as *naḥt* (called blending), involving the fusion of two words through a process of clipping and then blending. In their view, *naḥt* plays a minor role in word formation in Modern Standard Arabic (MSA)

(Emery, 1988). Another group of Arab grammarians perceives compounds in Arabic as being in the Construct State (CS), called *Idˤaafah* in Arabic. Emery (1988) noted that the compounding debate in Arabic has been hindered by a lack of precise definitions and reliable criteria, with challenges in defining the term for compounding and determining the status of the elements within a compound. This lack of clarity is evident in various studies where researchers interpret compounds in diverse ways.

Compounding has a limited role in Arabic (Amer & Menacere, 2020). Amer and Menacere (2020) outlined that compounding in Arabic is categorized into five types: CS, fusional compound (al-murakkabu l-mazjiyy), predicative compound (al-murakkabu l-isnaadiyy), numeral compounds from 11 to 19, and numeral compounds from 21 to 99. The syntactic connection between the two components of the fusional compound is either equal or ambiguous, primarily because most of these words are of foreign descent. In Arabic, they are considered to be a single word. The syntactic structure of predicative compounds exhibits predication, e.g., "taˤabbata-sharran 'to carry out evil'" (Amer & Menacere, 2020, p.566). They additionally pointed out that the syntactic relation between the two components of CS is basically possessive or genitive. The numeral compounds from 11 to 19 are treated differently; each numeral is treated syntactically as one word. Numbers from 21 to 99 are treated as two words that are inflected, e.g., *iθnan waʔiʃrun* 'twenty-two'. They did not provide a clear explanation of why such numerals behave differently from each other. Amer and Menacere (2020) maintained that Arabic also includes other compound forms that are generated through the integration of various types like compound particles, defective verb compounds, compound nouns, compound adjectives, compound verbs, and self-compounds.

Altakhaineh (2019) defined CS, called *Idˤaafah*, as a paradigm comprising either two nouns or an adjective and a noun in which the first component of the construct can take on nominative, accusative, or genitive cases, contingent on its role within the sentence. However, the second component of the construct is genitive. It is called in English the "genitive construct," the "construct phrase," or "annexation structure" (Ryding, 2005, p.205). Ryding stated that the *Idˤaafah* construct in Arabic has two elements: the first element or head is called *mudˤaaf* 'added element', and the second element is called

mudˁaf aliah ‘modifier’. Alhawary (2011, p.70-71) believed that the compound “expresses a possessive relationship between two or more things/nouns, but consists minimally of two nouns that make up a single (compound) noun”. He assumed that *Idˁaafah* in this definition is similar to the English possessive phrase by using the preposition *of,* e.g., the prince of Assir, or the possessive suffix -’s on the possessing noun “Cairo’s cafés” (Ryding, 2005, p.205). It is evident that the topic of CS is intricate, and it is subject to various interpretations and perspectives. Ryding mentioned that there are eleven types of CS and the boundaries between the CS types or the elements of phrase are not crystal-clear. These types are: identity relationship, e.g., *waziir-u l-sehat-i* ‘the minister of Health-definite’; possessive relationship, e.g., *maTaar-u Abha-a* ‘Abha Airport’; partitive relationship, e.g., *kull-a ʃahr-in* ‘every month’; agent relationship, e.g., “Sariir-u l-baab-i ‘the squeaking of the door’” (Ryding, 2005, p.207); object relationship, compositional relationship, measurement relationship, contents relationship, purpose relationship, quotation or title relationship, and clause relationship(3).

Fassi Fehri (2012, cited in Altakhaineh, 2019) noted that the initial part of the construct does not bear a definite article, while the second element may bear definite or indefinite articles. Additionally, Altakhaineh (2019) clarified that when the second component of the construct is definite, the first component in that construct also becomes definite, as illustrated in example (1) (Altakhaineh, 2019, p. 2).

(1) a. sayyaarat-u/a/i r-radʒ ul-i (MSA)

car-NOM/ACC/GEN the-man-GEN

‘the man’s car’

b. sayyaarat-u/a/i radʒ ul-i-n (MSA)

car-NOM/ACC/GEN man-GEN-INDF

‘a man’s car’

Ryding (2005) sought to offer a comprehensive overview of compounds and phrases in MSA. She categorized nouns in MSA into three main types: compound nouns, compound nominals (referred to as phrases), and complex

(3) Further discussion on this matter is outside the scope of this paper.

nouns. According to her classification, blending parts of two or more words into one forms a complex noun, while combining two words into one creates a compound noun. Compound nominals, on the other hand, are phrases consisting of two words that jointly convey a single meaning (Ryding, 2005). Ryding asserted that the term *naḥt* "blending" encompasses both complex nouns and compound nouns, whereas *tarkiib* "combining" specifically pertains to compound nominals. The following sections summarize Ryding's view of compounding in MSA.

1- Compounding into one word

naḥt

complex nouns

As stated above complex nouns are created by merging the parts of two words into one word and this process is called *naḥt*. Ryding (2005) demonstrated that there are numerous sub-processes of *naḥt* in MSA. It is used with technical or borrowed words in MSA. It can also be occurred by segmenting word parts and then blending the parts into one word; for instance, the word *julmuud* 'boulder' is created by segmenting parts of two words *jalida* 'freeze' and *jamuda* 'to harden' (Ryding, 2005).

Compound nouns:

Ryding (2005) stated that compounding means joining two whole words into one syntactic word in MSA. She said, "compound nouns function as word stems and may receive plurals or definite articles" (2005, p. 101).

2- Compounding into two words (called *Tarkiib*)

Compound nominals (called also coherent composite phrases)

The compound nominal has a more direct and straightforward structure than that of the *naḥt* compound. The *Tarkiib* compound consists morphologically of two words, which form a single word (3).

(3) a. [('qaa.wis)]ω[4] + [(qu. 'zih)]ω → [[('qaa.wis)]ω[(qu.'zih)]ω]ω

qaawis "arrow" + quziḥ "above, high" → Qaawis quziḥ "rainbow"

b. [(fa.'qir)]ω + [('damm)]ω → [[(fa.'qir)]ω[('damm)]ω]ω

faqr "poverty" + damm "blood"→ faqir damm "anemia"

(4) The symbol (ω) refers to prosodic word boundary. It is used here to show the boundaries between the two components of compounds.

The compound nominal is called sometimes *Idˤaafah* when the noun is not delivered in one word but a phrase (two words), e.g., *a'adam wujuud* 'non-existence' (Ryding, 2005). The compound nominals are marked for number by adding the number marker (dual and plural) to the head, e.g., *ɣurfat-u dʒuluus-in* 'living room-Singular', *ɣurfat-aa dʒuluus-in* 'two living rooms-dual', and *ɣuraf-u dʒuluus-in* 'living rooms-plural'.

Altakhaineh (2016a &b) argued that compounds in MSA are instances of the CS (also called Synthetic Genitive Construction, SGC). These compounds consist syntactically of two elements: noun plus noun or an adjective plus noun. Nevertheless, Altakhaineh reported that there are other combinations of noun plus noun that are not regarded as CS/SGC. He called this type of compound other than synthetic genitive constructs. He (2016b) defined SGC compound as "a complex word that consists of at least two adjacent words, where the second element is normally non-referential" and the "second element of a compound within an SGC is not, in most cases, freely pluralized" (p.278), e.g.,

(4) a. saaʕit l-yad

clock the-hand

'The watch'

b. saaʕit l-ʔayaadi

clock the-hand

'The watches'

On the other hand, the compounds other than synthetic genitive constructs includes compounds that have the following structures: noun plus noun compounds, noun plus adjective compounds, adjective plus adjective compounds, particles plus adjectives, and preposition plus preposition compounds (Altakhaineh, 2016a & b). Altakhaineh (2016b, c) claimed that compounds other than the SGC are either semantically double-headed or semantically headless(5).

In conclusion, it is evident that there is no explicit and accurate method available to definitively categorize a particular form as either a phrase or a

(5) This paper does not aim to address the topic of compound headedness or its identification.

compound in Arabic. Determining whether a compound in Arabic should be treated as a single word or two separate words proves to be a complex task. The aforementioned studies have approached compounds from various angles and have provided examples of construct states or compounds without delving into the specific criteria guiding their classification of a two-element construct as a compound in all the varieties of Arabic.

The acquisition of compounds

Few studies have focused on the process of acquiring, comprehending, and producing compound morphology in adult EFL learners in comparison to L1 studies (Slabakova, 2002; Uygun & Gürel, 2017; Kido, 2020; Ellis, 2022; Pham, 2022; Altakhaineh et al., 2023). The EFL learners sometimes encounter challenges in comprehending compounds because of the presence of syntactic and idiomatic opacity and lexical novelty associated with these compounds (Charteris-Black, 1998).

Pham (2022) in a recent study studied the L2 learners' acquisition of compound meaning by focusing on the role of conceptual and semantic factors. Pham investigated the compound meaning interpretation of L2 learners from various L1 backgrounds, including Thai and Vietnamese. The semantic relation defines how the meaning of both the modifier and its head are merged. Pham mentioned that the semantic relation received relatively little attention in the field of L2 lexicon studies. While certain less-established compounds may exhibit various semantic relations, leading to ambiguity in meaning, native English speakers often exhibit a preference for utilizing semantic relations or meanings. Thus, Pham (2022) examined the ability of English L2 learners to determine the prevailing semantic relationship of ambiguous new compounds. The study involved two groups of L2 college students: Thai L1 and Vietnamese L1 students. The students were instructed to participate in a multiple-choice task that required them to infer the dominant meanings of the compounds. The findings revealed that there was no significant difference in the total mean scores for the preference to use dominant meanings between the Thai L1 (63.37%) and Vietnamese L1 (70.75%) students. The results appear to indicate that the L2 students are able to recognize the semantic relations for the novel compounds. However, the results showed that the two groups show differences in the preference of dominant meaning at the item level. For instance, in regards to the compound

'student story,' the Thai L1 students have shown a preference for the dominant meaning "a story about student's life", whereas the Vietnamese L1 students opted to use the non-dominant meaning "a story told or written by student" (Pham, 2022, p. 94).

In the same vein, Ellis (2022) also asserted that L2 speakers encounter particular obstacles when it comes to utilizing morphosyntax and grammatical functions. The acquisition of grammatical morphology in an L2 is typically characterized by a gradual and fragmented process, frequently leading to inadequate acquisition. According to the theory of Input Processing, proposed by Van Patten (2007, cited in Ellis, 2022), which explores how the learners engage with the linguistic input as they are trying to process and comprehend that input. Ellis (2022, p. 36) mentioned that this theory incorporates the "Principle of Content Words Primacy," which posits that learners prioritize processing the content words in the input over other linguistic aspects. Moreover, it contains the "Lexical Preference Principle," which theorizes that learners rely on lexical items to derive meaning rather than grammatical structure or form.

Using CHILDES data, Kido (2020) examined the acquisition of syntactic verb-verb compounds and lexical verb-verb compounds in English-speaking and Japanese-speaking children. Kido found that the verb-verb compounds were not produced by the English-speaking participants and verb-verb compounds, and the parental speech did not include these constructions. The absence of verb-verb compound production is ascribed to inadequate exposure to such structures in the input. The Japanese children begin to produce the lexical compounds before the syntactic compounds. Kido assumed that the children comprehended the lexical verb-verb compounds as single-verb words rather than compounds.

Yang (2017) found that college students from various L1 backgrounds who are acquiring Chinese as L2 were able to deduce the meaning of new compounds involving semantic relations like "MADE OF", "IN", "FOR", etc. Yang concluded that the performance of L2 participants was comparable to that of their native-speaking peers. However, certain students encountered difficulties in identifying the prevailing meanings favored by their native-speaking peers. For instance, some L2 Chinese learners inferred the meaning

of “fish-shaped lamp” as “lamp used for fishing.” Moreover, Zhou and Murphy (2011) conducted a study on the comprehension of English noun-noun compounds among Chinese learners. The findings showed that the learners demonstrated proficiency in inferring and comprehending novel compounds. However, the variance in achievement rates between the advanced and intermediate learners was not deemed statistically significant. They found that the learners recognize the functions of both the head and its modifier. The learners used the modifier to interpret the meaning of the head. Zhou and Murphy found that the students could accurately identify the meanings in 59.87% of the time, e.g., the students interpret the meaning of “cheese burger” as “burger made of cheese” rather than a burger containing cheese. The authors claimed that this result could be due to the learners’ limited proficiency in English or to the influence of their L1.

Charteris-Black (1998) studied how challenging acquiring real and novel compound nouns is for L2 learners. The participants were 34 university ESL learners–from diverse backgrounds–enrolled in English for academic purposes courses. The findings indicated that the participants encountered challenges in comprehending compounds due to the idiomatic and syntactic opacity of compounds, and the lack of “culture-specific pragmatic knowledge” hindered the learners' ability to identify the deleted items within a compound (Charteris-Black, 1998, p.1). Nevertheless, once the learners are adequately exposed to the target language, the learners can easily overcome these challenges. The results showed that the learners employ figurative methods when navigating idiomaticity. Charteris-Black asserted that the difficulties encountered by ESL learners in acquiring compounds may resemble the challenges encountered by native speakers.

In their study, Middleton, Rawson, and Wisniewski (2011) examined the influence of words and context on the processing and interpretation of novel noun-noun compounds, such as "bee spider." The sample consisted of ninety-six native English speakers who were required to read texts that contained novel compounds with two potential meanings. The text contained contextual details that supported one of the two meanings either the most plausible meaning (dominant interpretation) or the less plausible reading (subordinate meaning) of novel compounds. Although the initial meaning processing was predicated on the words, the results of reading times implied that the students

used words and contexts in interpreting the novel compounds. Middleton et al. (2011) confirmed that the conceptual combination of novel compounds is not significantly distinct when it occurs within a specific context compared to when it occurs outside of that context. This entails that perception generation plays a crucial role in the interpretation of new combinations, both within and outside of a given context. Yet, as the authors concluded, it is important to note that context can also impact the interpretation process by influencing the activation of opposing meanings.

Eiesland and Lind (2012) studied the production of noun-noun compounds in "semi-spontaneous spoken texts" (p.236). Two groups of native Norwegian speakers participated in the study—one with aphasia and the other without aphasia. The results determined that compared to speakers without aphasia, the speakers with aphasia produce considerably fewer noun-noun compounds. They attributed the reason to the fact that the participants with aphasia produced fewer nouns compared to healthy participants. The authors claimed that noun compounds are more challenging to comprehend than simple nouns because the compounds exhibit lower frequency compared to nouns. However, when comparing the token frequencies of the compounds employed by non-aphasic and aphasic participants, the data revealed no statistical differences found in their usage of compounds. Additionally, the aphasic participants produce fewer less transparent compounds compared to the other group. The non-aphasic participants produce fewer different types of semantic relations than the compounds produced by the non-aphasic speakers. Compared to the non-aphasic participants, the aphasic ones produce compounds that have fewer distinct categories of semantic relations.

In a more recent study, Altakhaineh et al. (2023) studied the acquisition of noun compounds in English among a sample of sixty Jordanian Arabic-speaking (JA) students. They investigated the challenges the students might face in comprehending three types of compounding, specifically subordinative, coordinative, and attributive, regarding the concepts of exocentricity and endocentricity. The data was collected by employing a comprehension task in which the participants were instructed to provide the meaning of the compounds in each sentence without relying on dictionaries. The task comprised a total of 18 statements. The overall results demonstrated that the learners' comprehension of noun compounds is inadequate (29.2%).

However, for each of the three types of compounds, the participants performed better on endocentric compounds than on exocentric compounds. As for the learners' grasp of the three types, the subordinative compounds had the highest overall number of correct responses (n =141) than the attributive compounds (n = 95) and coordinative compounds (n = 79). The findings yielded that there were statistically significant differences between exocentric subordinative compounds and endocentric subordinative compounds; the results showed that the students' performance in endocentric subordinative compounds outperformed their performance in the exocentric ones. They attributed this result to two factors: the semantic transparency of endocentric compounds, which are similar to those in JA.

In sum, the aforementioned studies stated that EFL learners, children, and aphasic participants encounter difficulties in processing, producing, and comprehending compounds in general. These challenges potentially arise due to several factors, like the complex nature of compounds, variations in learners' L1 backgrounds, cognitive functioning, and processing constraints, semantic transparency of compounds, and insufficient input and exposure. Additionally, the lack of consistent criteria for determining compound structure in certain languages, such as Arabic, can further contribute to the challenges faced by learners in processing compounds effectively.

Research questions

To my knowledge, there appears to be a gap in the literature regarding the comprehension of English compounds among Saudi Arabic speakers. Therefore, building upon the work of Altakhaineh et al. (2023), the current study aspires to shed light on how Saudi female learners comprehend the meanings of three types of English compounds: coordinate, subordinate, and attribute. This research seeks to fill the gap in the existing literature and provide potential insights into the linguistic challenges encountered by Saudi learners. Thus, the present paper sets out to answer the following questions:

1- Do adult Saudi EFL learners grasp the English compounds?
2- Are there any differences between the three types of compounds among adult Saudi EFL learners?
3- Are there any differences between the endocentric and exocentric compounds among adult Saudi EFL learners?

Method

Participants

The sample consisted of 236 Saudi female students who were undergraduates majoring in English at the Faculty of Languages and Translation, King Khalid University. They were enrolled in levels seven and eight in the English Department. The students were registered in the Morphology course during the summer semester and first fall semester of the academic year 2023. They were between the ages of 19 to 21 years old. During their first two years as students, the participants received thorough instruction in language proficiency. In their last two years, they also took additional courses in the areas of translation, linguistics, and literature.

Instruments and procedure

Data was collected through the use of a questionnaire that comprised two sections. In the introductory section, the participants were notified of the purpose of the questionnaire. The consent form was also included in the introduction section. It emphasized that the participants' responses would be treated as totally confidential and anonymous. The participants were informed that they might terminate the questionnaire at any point prior to its completion. Also, the participants were told that their involvement in the study was optional. This section also collected demographic data from the participants.

The second section of the questionnaire contained the comprehension task. It comprised 24 items. The participants were provided with these items through a paper questionnaire. Following Altakhaineh et al.'s (2023) study, the participants were required to read the sentences and to provide the meaning of each bold compound in the given sentences (Appendix 1). Three types of compounds are examined in the present study: coordinative, subordinative, and attributive. Each type of compound is investigated in regards to the concepts of exocentricity and endocentricity. For each type, a number of compounds were employed, as represented in Table 1. The compounds consisted of various parts of speech, e.g., noun-noun compound (NN), verb-verb compound (VV), adjective-noun compound (AN), etc. However, in Altakhaineh et al.'s (2023) study, the focus was only on compound nouns. The researcher developed the sentences in the comprehension task. To examine the questionnaire's validity, three assistant linguistics professors and one associate professor reviewed and approved its items.

Table (1) Compound items

Compound type	Notions	Compounds	Category
Subordinative	Endocentric	Street seller	NN
		Apple cake	NN
		Sun glasses	NN
		babysit	NV
	Exocentric	brainwashed	NV
		pickpocketed	VV
		killjoy	VN
		Cut-throat	VN
Attributive	Endocentric	School bus	NN
		Keyword	NN
		Lemon yellow	NA
		Ice-cold	NA
	Exocentric	Loud mouth	AN
		Egg head	NN
		Bird brain	NN
		Red head	AN
Coordinative	Endocentric	Actor-director	NN
		Blue-green	AA
		Stir-fry	VV
		sweet-sour	AA
	Exocentric	mind-brain	NN
		north-east	NN
		father-daughter	NN
		pass-fail	NN

Procedure

The participants received the questionnaire for completion during the class. It took the participants around 30 minutes to complete it. The participants were requested to read the sentences and to provide the meaning of bold compounds without relying on dictionaries.

Data analysis

The researcher performed quantitative data analysis to study the acquisition of compounds in English. The students' responses were evaluated as either correct or incorrect. Responses that were correct were assigned a score of 1, and incorrect responses were assigned a score of 0. The response was deemed correct if it provided the correct interpretation of the compound. For example, if the response correctly conveyed the interpretation of the emphasized compound "killjoy" as a person who spoils other people's pleasure, it was regarded as accurate. In this regard, the response is assigned a score of 1. The data were analyzed using IBM SPSS (26). SPSS was used to test the questionnaire's reliability. The Cronbach's Alpha for the entire questionnaire is 0.820, demonstrating good reliability and asserting its consistency.

Results

The means and standard deviations of students' grasp of compounds are outlined in Table 2. The total mean score (M = 5.98, SD = 0.080) of participants accurate responses demonstrate that they may struggle to completely comprehend the three types of compounds in general. However, a one-way ANOVA with repeated measures revealed a significant difference between the three types of compounds among participants, F (2, 470) = 3.1331, p = 0.04.

Table (2) Descriptive data of students' comprehension of compounds

Compound type	N of students	Sum of accurate responses	Mean	SD	Percentage
Subordinative	**236**	**1446**	**6.13**	**1.423**	**77%**
Attributive	**236**	**1388**	**5.88**	**1.376**	**73.5%**
coordinative	**236**	**1402**	**5.94**	**1.757**	**74.2%**
Total			**5.98**	**0.080**	**75%**

The whole accuracy rate of participants mastering of compounds is 75%. Despite being senior students, they did not fully comprehend the compounds. The participants achieved the highest accuracy score (77%) in predicting the meanings of subordinative compounds compared to predicting the meanings of attributive (73.5%) and coordinative (74.2%) compounds.

Table (3) displays the means, standard deviations, and percentages of three compound types regarding exocentricity and endocentricity among adult Saudi EFL learners.

Table (3) Descriptive data of students' comprehension of three types of compounds

Compound type	Notions	N	Sum of accurate responses	Mean	SD	percent of accurate responses	Percent of inaccurate responses
Subordinate	Endocentric	236	856	3.62	0.669	91%	9%
	Exocentric		590	2.50	0.996	63%	37%
Attribute	Endocentric	236	852	3.61	0.569	90 %	10 %
	Exocentric		536	2.27	1.131	57%	43%
coordinate	Endocentric	236	732	3.10	1.035	78%	22%
	Exocentric		670	2.83	0.980	71%	29%

The above table shows that the students' performance in predicting the meanings of different types of compounds varied. A one-way ANOVA (repeated measures) was run to test the differences in the participants' acquisition of endocentric subordinate compounds, endocentric attribute compounds, and endocentric coordinate compounds. The test confirms that there is a significant statistical difference in predicting the meaning of three types of compounds, F (2, 470) = 42.884, p < .000, as shown in Figure 1.

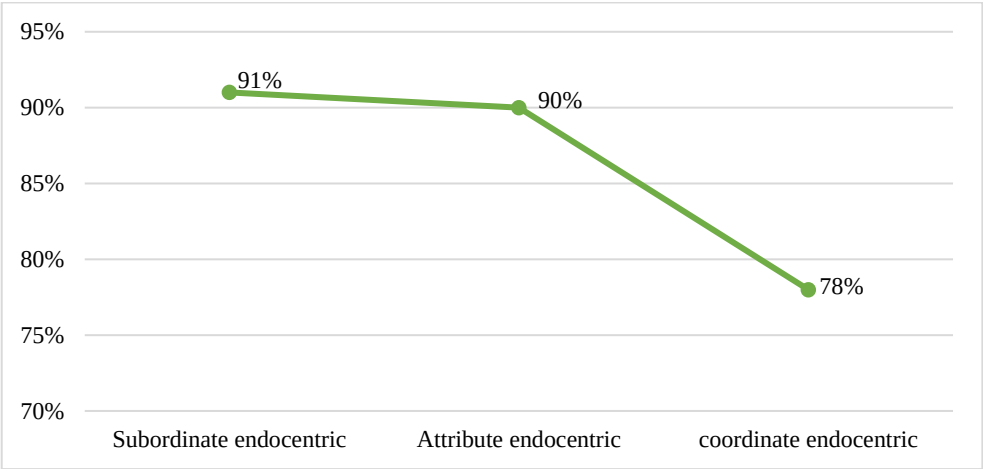

Figure (1) The percentages of participants' accurate responses to three endocentric compounds

The post hoc pairwise comparisons (Bonferroni) of three endocentric compounds confirmed the participants' scores for predicting the meaning of

these compounds are significant, p < 0.000. Their total scores for the subordinative endocentric compounds (91%) and attributive endocentric compounds (90%) were significantly better than their scores on coordinative endocentric compounds (78%). However, there were no significant differences between the attributive and subordinative endocentric compounds (p = 1). The performance of the participants in predicting the meaning of these two compounds is relatively similar.

To compare the participants' accurate responses on the subordinative, attributive, and coordinative exocentric compounds, a one-way repeated measures ANOVA showed a significant main effect for the three types of exocentric compounds, *F* (2, 470) = 33.344, p < .000, as demonstrated in Table 3 and Figure (2).

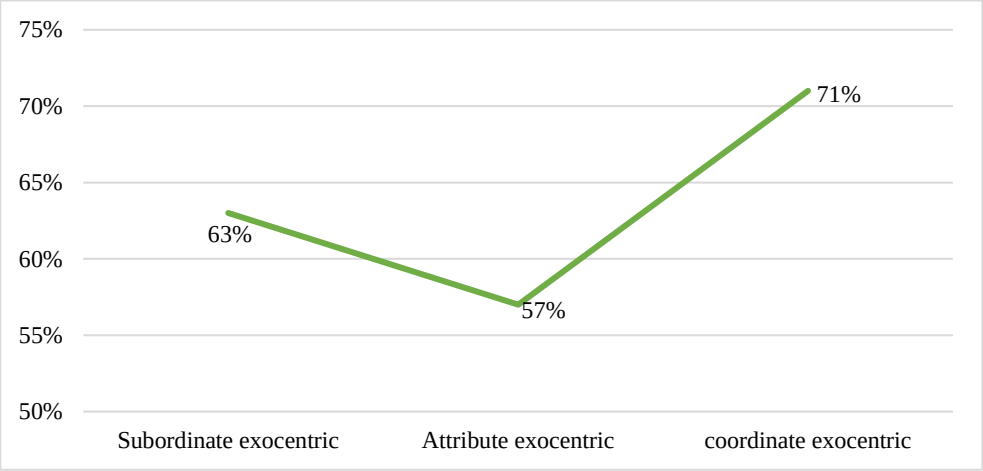

Figure (2) The percentages of participants' accurate responses to three exocentric compounds

Pairwise comparisons of exocentric compounds (Bonferroni test) displayed that the participants' performance for the coordinative exocentric compounds (M = 71%) was significantly greater than their performance on either the subordinative or attributive exocentric compounds (p < .000). Their performance on the subordinative exocentric compounds (63%) was higher than their performance on the attributive exocentric compounds (57%, p < .000), as shown in Figure 2. However, the participants' overall performance is far from native like performance despite being senior students. This

suggests that the students struggled to predict the correct meanings of these three types of exocentric compounds.

A paired-samples t-test was performed to examine if there are any differences between the endocentric and exocentric compounds among adult Saudi EFL learners. The results indicated the students' overall performance on endocentric compounds is higher (M = 10.33, SD = 1.607) than the exocentric compounds (M = 7.61, SD = 2.496). The paired-samples t-test showed a significant mean difference between the exocentric and endocentric compounds, M = 2.72, SD = 2.011, $t(235) = 20.84$, $p < .000$.

Discussion

The present study investigated the acquisition of compounds by Saudi EFL female learners. Specifically, the objective was to examine whether they can predict the meanings of three types of compounds. Additionally, the study aimed to identify any differences in the performance of the Saudi learners across the types of compounds and, finally, whether there are any variations in their understanding of the endocentric and exocentric compounds.

To answer the first research question, the results revealed that the learners displayed some understanding of compounds in general (75%). This suggests that the learners did not reach mastery as native speakers. This finding is consistent with the results obtained in Pham's (2022) study (Thai, 63.37% and Vietnamese, 70.75%) and Altakhaineh et al.'s (2023) study (29.2%). However, the performance of Saudi learners is higher than that of Jordanian students in acquiring compounds in English. The Arabic-speaking learners struggle to comprehend the compounds as none of them reach native-like performance although they are advanced learners. These results are in accordance with the results obtained by Zhou and Murphy (2011) who found that 59.87% of Chinese learners can accurately predict the meanings of compounds. This suggests that the acquisition of compounds is difficult for EFL learners with different L1 backgrounds. These findings could be attributed to the learners' proficiency level in English or to the impact of their L1 (Zhou & Murphy, 2011). Moreover, the results displayed that the participants attained the highest accuracy score in predicting the meanings of subordinative and attributive compounds as opposed to predicting the meanings of attributive and coordinative compounds, whereas, in Altakhaineh et al.'s (2023) study, no statistical differences were found

between the three types of compounds. One possible explanation for these findings could be related to the complexity of compound structures. Unlike simple words containing one morpheme, compounds consist of two free components, potentially posing difficulty and challenges for learners to comprehend compounds.

To answer the second research question, the findings demonstrated that there are variations in the acquisition of three types of endocentric compounds. The findings displayed that the learners were equally likely to comprehend the subordinative and attributive endocentric compounds. However, they lagged behind in acquiring the coordinative endocentric compounds. Compared to Altakhaineh et al.'s (2023) findings, Jordanian learners easily acquired the subordinative, attributive, and coordinative endocentric compounds more than the exocentric ones. This might be attributed to the fact that the two components do not modify each other in the coordinative compounds but retain equal significance. The learners might predict the meaning of the whole compound by relying on one of the meanings of the two components rather than on equally the meanings of both elements, e.g., sweet-sour. Some of the students rely on the first element, *sweet*, as the head of the compound, and others on the second element, *sour*. Another explanation for this result might be attributed to the impact of the context in which the compound is found (Middleton et al., 2011). The findings maintained that the Saudi learners exhibited similar performance to Jordanian learners in which the Saudi participants had better performance in acquiring the subordinative, attributive, and coordinative endocentric compounds than the exocentric ones. As stated above, the defining compounds in Arabic are under debate, which might make it challenging for learners to comprehend the compounds in the target language. This lack of clarity is apparent in their usage of subordinative, attributive, and coordinative exocentric compounds. Another problem in Arabic compounds is that they lack unified criteria for determining whether a compound should be considered as a single word or two separate words. Thus, this lack of consistency might impose challenges for learners to grasp compounds in the target language. Given that the L1 grammar of the learners may impact their acquisition of compounds in the target language (i.e., L2), this becomes a complicated task to acquire.

Answering the third research question, the findings proved that there are variations in the learners' mastery of the endocentric and exocentric compounds. The exocentric compounds are the most difficult category to acquire for EFL learners. These results are in accordance with those of Altakhaineh et al. (2023). In short, it can be inferred that the learners L1, namely Arabic, had a negative impact on their acquisition of three types of compounds because compounds in Arabic are limited and unproductive in comparison to English compounds. Altakhaineh et al. (2023) added more factors that might hinder the mastery of compounds, such as the compounds' headedness in which some compounds are headless. The head position in Arabic and English compounds is not similar and could affect the learners' understanding of compounds. Altakhaineh et al. assumed that the learners' familiarity with the various types of compounds could affect the acquisition of these compounds. They also assumed that the semantic transparency of endocentric compounds could be considered a factor in learners' acquisition of these compounds.

Limitations and Future Research

Despite the interesting findings obtained, it is necessary to acknowledge and address the limitations of this investigation for future research. The findings of the present study cannot be generalized to all Saudi EFL learners because they are constrained by their focus only on female students at KKU. The findings cannot be assumed representative of EFL male learners. Future researchers might include other participants from different Arabic dialects. Further research is needed to incorporate a more diverse sample size to enhance the conclusions' reliability, robustness, and generalizability. It is also possible to use other data collection methods (e.g., multiple-choice tasks, oral tasks, etc.) to better explain the results and to generalize the findings as well.

Research Implications

These findings hold some pedagogical implications. To improve the generalizability of the findings, teachers are advised to explain compounds in English from a linguistic perspective and to draw comparisons with compounds in the students' L1, i.e., Arabic. This comparative approach might provide effective insights and facilitate a greater understanding of compounds for EFL learners. The results have shown that when learning compound words, learners find it easier to comprehend endocentric compounds

compared to exocentric ones. Thus, it is advisable that the instructors and curriculum designers focus on teaching both the endocentric and exocentric compounds at the same time, in order to facilitate a more continuous learning process for the students and then prioritize teaching exocentric compounds in order to ensure that the students are absorbing the meanings of exocentric compounds. The findings additionally carry implications for theories of conceptual combination, particularly those formulated based on evidence of how individuals combine concepts in isolation from discourse contexts.

Conclusion

The findings of this study clearly indicate that the participants, although they are senior students, still encounter significant challenges in interpreting and comprehending the compounds in English even when these compounds are presented in context. Thus, they displayed deviations from native-like performance in using compounds. It can be concluded that the endocentric compounds are significantly easier for learners to grasp than the exocentric compounds because these compounds are semantically transparent. The learners equally acquired the subordinative endocentric compounds and attributive endocentric compounds, with coordinative endocentric compounds following closely in comprehension.

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Appendix 1

Dear participants,

The researcher is conducting a study on how Saudi learners understand sentences with various types of compounds in English.
You are kindly requested to respond to the items of the questionnaire.
It should take 30 minutes to complete the questionnaire.
Your participation is anonymous and will be used only for research purposes.
Your participation is voluntary. You may refuse to take part in this study at any time.
Part 1 Demographic information (Required)
Age: _____

Part 2

For each of the following sentences, please provide the meaning of bold compounds:

1. He **brainwashed** his employees.
_____

2. I know a **street seller** who sells nice shoes.
_____

3. Someone **pickpocketed** my handbag.
_____

4. He does not want to be a **killjoy**.
_____

5. The **school bus** crashed into a wall this morning.
_____

6. There are many types of **apple cake** .
_____

7. She broke her **sun glasses**.

_____

8. ‘Stop’ is the **keyword** in that situation.

_____

9. My dress was **lemon yellow**.

_____

10. All shirts in that store are sold at **cut-throat** prices.

_____

11. He is **loud mouth** and cannot be trusted.

_____

12. You are an **egg head**.

_____

13. My baby is not a **bird brain**. He is clever.

_____

14. The **actor-director** James dies at 78.

_____

15. What knowledge is represented in and processed by the **mind-brain**?

_____

16. She has a **blue-green** ring.

_____

17. The garden is 100 kilo meters **north-east** of Abha city.

_____

18. Add rice then **stir-fry** for 10 minutes.

_____

19. Why did not you make **sweet-sour** chicken?

_____

20. They were impressed by our **father-daughter** relationship.

_____

21. The fridge is full of **ice-cold** juice cans.

_____

22. They took one side and the **red head** the other.

_____

23. They **babysit** their grandchildren.

_____

24. It is a **pass-fail** course.

_____