

Conceptualization of Morphological Roots in Arabic and English: A Contrastive Analysis

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Abstract

This paper aimed to build a contrastive orientation of notions of morphological roots in Arabic and English. The basic question addressed in this paper is whether there exist common properties of the root in Arabic and English.

Belonging to two different language families, the two languages' morphological systems are at extremes, creating challenges for interested learners and researchers. The contrastive analysis method was adopted. This analysis could provide data about the similarities and differences of the root's structure, which can be used to meet the current study's goals.

A general contrast of the morphological system of the two languages was provided, focusing on the structure of the entity of the root in those languages. The roots' morphological properties were contrasted to reveal and identify differences and similarities between the two languages.

Findings revealed that a root in Arabic is a general abstraction, whereas in English, it is a concrete language item. There were few instances of resemblance of morphological behavior.

Exploring the similarities and differences between the two languages would provide important pedagogical implications. It could also highlight potential language learning and teaching difficulties.

Keywords: Contrastive Analysis, Root, Morpheme, "Wazn" (Morphological Pattern), Morphological Scale

1. Introduction

Belonging to two different language families, Arabic and English are morphologically asymmetrical. Arabic is a member of the Semitic language family. Peculiar of Semitic languages is the "algebraic structure displayed by nominal patterns and verbal paradigms. For more than a millennium already, Semitic grammarians, both native and Western alike, have upheld the existence of a linguistic entity called 'the Semitic root'" (Rubio, 2005, p. 45).

Semitic morphology is generally characterized as nonlinear or nonconcatenative (Shimron, 2003). The root in Semitic languages is a discontinuous skeleton of consonants with vowels intertwined to form stems (Rubio, 2005). Verbs and most nouns in Semitic languages are formed from abstract consonantal roots, which are sequences of consonants or "radicals." These roots are then combined with vowels and nonroot consonants to create actual words, following specific patterns based on morphological categories. The consonantal root gives rise to a set of potential meanings corresponding to a specific lexical domain or subdomain.

In English, a root is the primary lexical entity of a word—the basic part that is always present in a lexeme. It is the core of a word that cannot be segmented into smaller, more significant components.

In contrast to Arabic, a root can itself be a word or linear morphemic structure where morphemes (called affixes) are placed one after the other before or after the word stem.

The root in English has three basic characteristics (Cao, 2022). First, it is that unanalyzable and unchangeable part of a word that defies further analysis and conveys the word's main lexical meaning. Second, it is the part of the word that is left bare or to which affixes can be added. Third it is a free or bound morpheme providing a categorization that is significant in morphological analysis.

2. Methodology

This paper adopts the contrastive analysis method (developed in the 1960s), which has dominated the scene of language teaching, acquisition, and research. Lado developed his contrastive analysis perspective by adopting Fries' assumption that the most effective materials are those based on a scientific description of the language to be learned and carefully compared with a parallel description of the learner's native language (Lado, 1971). Adequate data about the similarities and dissimilarities found at basic levels of linguistic analysis (pronunciation, vocabulary, and grammar) would serve the different goals just mentioned. The data could also point to potential areas of difficulty in language learning and teaching.

3. Significance

The study of the conceptualization of the morphological root in Arabic and English and attempting contrastive orientation of these notions has not received due attention in relevant scientific research. The core objective of the paper is to provide data and results that might contribute baseline information for scientific research pertaining to the subject of the current paper. The findings of this research are expected to provide useful information to certain groups involved in the language learning process such as teachers, scholars, syllabus designers, publishers etc. Research, as it gives new insights and perspectives, reinforces teaching and learning which are apparent educational demands in the field of ELT.

4. The Root in Arabic Morphology

Because we are seeking to examine the nature of the word “word,” we should consider its semantic classification and trace its impact in terms of its morphological structure. With regard to meaning, in Arabic language (Al-Mubarak, 1964), there are words of meanings (semantemes)—words that themselves indicate meaning and have an independent concept. Alantaki (1969) referred to them as “essence words.” They constitute the vast category of content words. In English, these are free lexical morphemes such as “book.” In Arabic, these are the derivatives produced from the Arabic abstract triconsonantal root (i.e., “f-ā-l”) by employing the “wazn” method. Thus, from the triconsonantal root “k-t-b,” we obtain the meaningful lexical words “katab” (write) and “kitab” (book). In fact, this triconsonantal root is the most striking example of Arabic morphology. The formula (“f-ā-l”) is a hypothetical one that accepts insertion of a set of affixes to form words. This root “can show very useful organized peculiarities, making Arabic so easy to understand and making the Arabic words formed systematically . . . root consonants serve as the stable semantic code that helps to determine the lexical meaning of a word, and the ‘phonetic bell’ balance helps to divide the words into phonetic, morphological, lexical, and semantic categories” (Mingazovae et al., 2022, p. 2634).

There are also words of another kind that are not independent and do not indicate an independent concept. Alantaki (1969) referred to them as suffixes modifying essence words. They are morphemes that link meanings of words, define them, and allocate their meaning in a kind of specification, such as articles, some adverbs, and pronouns. They function as grammatical morphemes, but they were originally words stripped of their meanings and transferred from lexical to functional morphemes. Linguists describe these as empty roots.

According to Mahfoudhi (2007), there are two major opposing theories of Arabic morphology. On the one hand, there is the morpheme-based theory, whose proponents argue that derivations are based on the process of mapping out roots in patterns. For instance, the word [rakib] “ride” is made of the root {r, k, b} and the pattern (CaCiC). The root carries the core meaning of the word “riding,” and the pattern has the syntactic meaning “perfective, active.” Arab linguists proposed that the pattern be divided into three morphemes represented on separate tiers according to auto segmental phonology: (i) the skeleton made of vocalic and consonantal slots; (ii) affixal consonants, if any; and (iii) vowels. On the other hand, there is the stem-based theory, which maintains that derivations are stem based.

“Elim Al-Saraf” is the Arabic term for morphology, which is the branch of linguistics concerned with the structure and development of words. This field investigates variations in the structure of words and forms to determine the root and other word constituents. Complicated rules based on unique regularities govern Arabic’s morphological processes. In comparison to Western languages, Arabic morphology displays logical regularities (Dentine, 2007). It exhibits rigorous and elegant logic (Ryding, 2014).

5. The Notion of “Root” in English

Distinguishing roots from nonroots can be a challenging task (Katamba & Stonham, 2007). This is because certain roots can transform into nonroots, and vice versa. Take the nonroot “-ism,” for instance, which can be found in words like “fatalism,” “pragmatism,” “fascism,” and “communism.” In these cases, “-ism” has evolved into a complete root, as seen in the phrase “I’m disgusted with all these isms.” We can consider “-ism” to occupy the position of both a root and a nonroot. It functions as a nonroot when used as a suffix and as a root when used as a noun.

The way free root morphemes are distinguished from bound root morphemes can be confusing. The former can stand by themselves to constitute base forms of words, whereas the latter cannot assume a similar role. “Ship” is a free root morpheme when it denotes a lexical meaning of a sea carrier, and a bound root morpheme or, more precisely, a suffix of nouns denoting condition, character, skill, and so on (e.g., clerkship, friendship, statesmanship; “Ship,” n.d.). With cranberry morphemes, matters become more complicated, as will be illustrated later in this section.

In English, a root is a morpheme that has a lexical meaning. McCarthy (2002) emphasized the semantic dimension of the nature of the term “root.” He defined it as a meaningful morpheme that constitutes the core of a word and that makes the most specific and concrete contribution to the word’s meaning. Similarly, Stockwell and Minkova (2001) put roots at the center of word-derivational processes as they carry the basic meaning from which the rest of the sense of the word can be derived. However, a variety of morphemes reinforce the difficulty of tying morphemes tightly to meaning (McCarthy, 2002). These are cranberry morphemes.

Cranberry morphemes or unique morpheme (Bauer, 2003) occur in only one fixed expression in the language. The morpheme “cran-,” for instance, has no meaning and cannot act on its own as an independent word. It does not by itself make any predictable semantic contribution in combinations where it occurs. It appears in cranberry, boysenberry, and huckleberry. These collocations are all names of berries. Isolating the last unit (i.e., “-berry”) as a meaningful morpheme, we are left with the items boysen*, cran*, and huckle*. None of these items occurs either independently or in any other words. There is thus no noncircular way of assigning meanings to these

morphemes. Their meanings are intimately connected with those of the individual words in which they occur (Aronof, 1985).

Parallelism with other morphs that are not unique determines the status of unique morphs (Bauer, 2003). The suffix “-ter” in the word “laughter” is identified as such because it shares similarities with words like “arriv-al,” “marri-age,” “inject-ion,” where a verb is placed at the beginning and there are clearly recurring suffixes in similar constructions. The morph “cran-” is considered a root because of its parallels with “blackberry,” “blueberry,” “cloudberry,” “snowberry,” “waxberry,” and so on. The meaning associated with a unique morph is determined by subtracting the meanings associated with the known morphs in the construction from the overall meaning of the construction. Therefore, the meaning attributed to “cran-” is precisely what categorizes cranberries as a subset of all berries.

Recently, and in contrast to this semantically oriented view of roots, roots have become a prominent unit from a syntactic point of view according to several contemporary linguistic theories. These theories propose that roots are a basic syntactic unit and that word formation to a greater or lesser extent is syntactic (Lohndal, 2020).

Katamba and Stoneham (2007) provided a syntactic view of the root as the irreducible core of the word to which nothing else is attached. This core element is the base for building lexical. It is the part that must always be present in various representations of lexemes, possibly with some modifications. For example, “walk” is a root word and appears in the group of word forms that instantiate the lexeme walk (“walk,” “walk,” “walking,” “walk,” etc.).

Relevant literature proposes three different views about the nature of roots (Lohndal, 2020).

One approach assumes that roots do not have an inherent lexical category.

Other approaches adopt roots, but they crucially assume that roots have an inherent category. Lieber (2006) claimed that if roots lack categories, then affixes cannot select particular categories of roots. She stated, on the basis of this potentiality of affixal selection, that a theory of word formation must acknowledge and account for the propensity of affixes to be choosy about what sorts of bases they attach to.

The third approach assumes that roots hold little grammatical information and thus can be considered category-neutral. That is, roots are not stored in the mental lexicon with a category; rather, roots acquire a given category by being merged into a syntactic derivation (Lieber, 2006, 5). For instance, depending on the grammatical context in which they occur, roots like “stone” and “book” represent concepts and can either be nouns or verbs.

Evidence of the third approach has been provided by Borer’s argument (2009), as cited by Belder and Craenenbroeck, (2015), that lexical vocabulary items do not project any categorical features. Borer assumes that the flexibility open- and closed-class lexical elements allow for in their interpretation varies significantly. The example cited from Borer in pertains to the word “stone”:

- a. I’ve got a stone in my hand.
- b. There’s too much stone and metal in this room.
- c. They want to stone this man.

The word “stone” assumes a variety of grammatical classes (only in the contexts provided above) in these three examples: it is used as a count noun (a) and as a mass noun (b), whereas in (c), it is used as a transitive verb. The selectional category of the word stone is context dependent in each of the three cases.

6. Arabic *Almizan Alsarfi and Wazn*

Arab grammarians developed a unique and peculiar linguistic tool, called '*Almizan Alsarfi*' the morphological scale, to govern these regularities. This scale takes a triconsonantal root as its base. The rationale for using a triconsonantal root is because most Arabic words are triconsonantal, hence Arab linguistics have taken this into account.

The concept of root in Arabic morphology is associated with the process of '*wazn*'. The term '*wazn*' in Arabic refers to a system of patterns and schemes. It is a fixed prosodic template associated with certain morphosyntactic and semantic properties (Xu 2021). A pattern is a bound and in many cases, discontinuous morpheme consisting of one or more vowels and slots for root phonemes (radicals), which either alone or in combination with one to three derivational affixes, interlocks with a root to form a stem, and which generally has grammatical meaning (Ryding *ibid*).

The function of '*wazn*' (Alistrabazi, as quoted by Kasemmohamad (2022)), is the segmentation of the word pattern to determine original letters, and the additional affixes attached to it. The original letters then referred to as the word root. As mentioned earlier the basic pattern of this root is triconsonantal consisting of the three letters 'f-ā-l'. The structure of this abstract typical pattern (i.e. 'f-ā-l') which means 'do' is common to all derivate verb and the noun forms connected to it is common to all the verbs and the nouns connected to performance and motion. In the examples below

k-t-b (root) katab-a = write (v.) writing (n.)

q-t-l (root) kill (v.) qatal-a killing (n.) qatal

the verb and nouns forms not only share their verbal but also share their meaning.

Each of the two sets of the Arabic words in in the example above, is formed from a particular root and is united by the bond of timbre and

tone, which distinguishes them in audible speech from other words, just as they are united or almost by the bond of decorative symmetry in written speech (Hijazi 1987). This common tone between words that are of the same pattern helps to extract the common meaning between them.

The musical characteristics in of the words patterns in the Arabic language are distinct and have no counterpart in many other languages. The words that indicate the active participle or the passive participle of verbs in French or English do not have a common musical weight or a single tone because the inflectional and derivational mechanism of these languages is processed via the methods of affixation by adding some letters to the word at its beginning or end, and from that arise words that do not have a similar meter or structure, and have nothing in common except the presence of similar sounds at their beginning or end.

Also with reference to the French or English language, for example, when examining their forms and structures according to their own methods of prefixation and suffixation, we will find that they are limited and very few in number in contrast to the forms and patterns in Arabic. It should be noted in this regard that while the Arabic word formation method has developed patterns of specific sculpture, tones, and syllables, the methods of Indo-European languages, in contrast, are just portmanteau or affixation. (Hijazi ibid).

The scale regulates the mechanism of derivation and inflection in Arabic language. Zreik showed that this morphological scale has a very positive value in distinguishing Arabic language by the momentum of derivation from the root. It (i.e., morphological scale) further enables the process of Arabization of foreign words. Among its benefits is the distinguishing between the triple, quadruple, and pentagonal nouns and verbs. It determines the origins of the word from its affixes and the process of deletion and affixation to word root (Zreik 2017).

In fact, comprehending the morphological systems of these two languages requires demonstrating the distinctions and nature of the term root in Arabic and English. In general, the root in English is a lexical root, but it is a functional root in Arabic. In contrast to English, the Arabic language, as seen above, has a completely distinct conceptualization of the term root. It is impossible to categorize it using grammatical categories (i.e. verb, noun, adjective...etc. Early Arab linguists did not use the term 'root'. The prominent Arab linguist Sebaweyeh and first Arab lexicologist Al Farahidi have not used the term (Hanon (2014)). But later Arab linguists frequently use the term 'root'.

Unlike English, the Arabic morphology, does not in general, allow the occurrence of a free morpheme (Bouzegehaia 2017). Arabic has the root and pattern tie referred to earlier in this study. Only a set of morphemes (few in number and functional in nature) do not fall within the scope of this tie. Examples of these include *meaning letters* such as prepositions *min* (from), *kaf al-tashbih* (the 'k' for indicating simile) and conjunctions such as *wa* (and)...etc. Such examples are frozen in contrast to derivate forms. Derivation in Arabic necessarily means coexistence of two levels; the lexical origin (the abstract triconsonantal root) and the wazn. So the Arabic word *rajul* (man) has the root r-j-l and the pattern c-a-c-u-c.

6.1 Productivity of Arabic Root

The root of the Arabic word is seen as is that first basic substance which consists of letters. It is usually bi or triconsonantal that give a general meaning about a particular idea. This 'root' is viewed as an empty one (Bufra 2018). The Arab Linguist ibn Jinni who considered the origins of words to be merely discretionary. In other words, the root is hypothetical for him, which is the same perception of many contemporary Western Semitic linguistic theories. The notion of root assumes a coexistence of three sets of morphemes within the root. The first set is made up of two, three for four consonant morphemes and these are primary components in the root structure in Arabic. The second set are the vowel morphemes and the third set are affixal consonants. These sets of morphemes allow the different word pattern in Arabic [see McCarthy ibid]. Using affixes and parsing signs, the root, k-t-b produces the basic meaning of 'writing' and the meanings associated with it. This root theoretically gives the following roots:

k-t-b
k-b-t
t-k-b
t-b-k
b-t-k
b-k-t

It is necessary, in this regard, to distinguish between the core general meaning of the root (ideally theoretically based) on the one hand, and the specific meaning associated with the uses of the root in its connection to a group of multiple morphological forms found in the Arabic language, on the other hand.

The primary components of the root (i.e. consonant morphemes) have no direct existence in the linguistic reality but just an abstract form (Hegazi 1987). But this abstractness does not discard its linguistic reality because it constitutes a linguistic evidence composed of a signifier and signified. Hence, it is a real tangible component serving as part and parcel of the language system (Hanon 2014). Though it shows an abstract character, this concept turned out to provide an appropriate algorithm for the phoneme, prefix, suffix and aspect.

Al-Farahidi (Boufarra 2018) introduced the theory of 'Al-Usul' (the origins) and ' metathesis. This theory provides the possibilities for arranging and rearranging the letters of the root as shown in the example of k-t-b above. This is processed in a mathematical manner via an algorithm for number factorials. The root patterns would then be calculated according to the number of letters that constitute the given root.

According to the theory of 'Al-Usul' the minimum of these letters is two and the maximum is five; according we have following potential patterns:

bilateral root: $1 \times 2 = 2$

trilateral root: $1 \times 2 \times 3 = 6$

quadrilateral root: $1 \times 2 \times 3 \times 4 = 24$

quinteliteral root: $1 \times 2 \times 3 \times 4 \times 5 = 120$

This 'empty one' is a characteristic of the Semitic languages which do not allow their roots to appear on their own, as in where roots consist of consonant clusters that become stems or words by virtue of vowel insertion (Lohndal, Terje 2020). That the root in Arabic is a "relatively invariable discontinuous bound morpheme, represented by two to five phonemes, often three consonants in a specific order, which interlocks with a pattern to produce a stem and has lexical significance" (Ryding, *ibid* 2005:45).

These three consonants are represented by the letter 'f-ā-l' in Arabic grammar. Basically the root is firmly associated with the meaning it is assigned with (Albed 2007). Affixes will be added to this root to generate various word patterns. The Arab grammarians explain the function of these affixes (10 in total) and their placement in the root. Seven consonants (? t, m, n, s, y, w) and three vowels (/a/, /i/, and /u/) make up the Arabic affixes. On the basis of the components listed above, the Arabic derivational system appears to be a very fruitful one. A single root can produce a variety of forms that all pertain to the same semantic domain, as indicated by the root's lexical meaning. The Arabic root

(r-s-m), which meaning to draw (a picture), can be derivate as in the following-ر-س-م

forms:

He created a painting called rasama (v.)

painting rasm (n.)

painter rassam (n.)

painters (pl. masc.) rassamun (n.)

painters (pl. fem.) rassamat (n.)

drawing (singular) rasmah (n.) paintings (plural) rusumat (n.)

paintings (plural) ruswum (n.) studio,

place for painting marsam (n.)

6.2 Concatenative vs Nonconcatenative

The derivational process in the example above shows that Arabic morphology is nonconcatenative and based on discontinuous morphemes. It displays a system of consonant roots that interlock with patterns of vowels to form words. Nonconcatenative patterns are morphological patterns in which the shape of the base is modified without adding segmentable material (Sims & Haspelmath, 2010). Whereas this is a regular process in Arabic, such an operation is rare in English. The morphology of English is typically concatenative, forming lexical items by putting at least two distinct morphemes together. However, it has constructions that are nonconcatenative, as illustrated by the inflection applied to the consonant sequence "s-ng." By inserting different vowels into the vowel slot between the /s-/ and the /-ng/, several different English words can be formed: "sing" (v.), "sang" (v.), "sung" (v.) and "song" (n.).

Other forms can be developed from this string (i.e., "s-ng"), such as "sing-ing," "song-s," "sing-s," "sing-er," and "un-sung." As a comparison, the consonant sequence "s-ng" corresponds roughly to the concept of an Arabic consonantal root, whereas the vowels and affixes correspond approximately to the Arabic concept of patterns (Ryding, 2014). Other examples in English include irregular plural noun forms such as "goose/geese," "man/men," and irregular past tense verb forms such as "break/broke," and "drink/drank."

Base modification may also take the form of a tonal change or stress shift. English has verbs that differ from their corresponding nouns only by stress placement, for example, díscount (noun), discóunt (verb), ímport (noun), impórt (verb), ínult (noun), insúlt (verb). Another base modification process that results in nonconcatenative patterns is voicing. English has a few voicing cases where a verb is derived from a noun by a different operation, that is, voicing the last consonant of the root. For example, hou[s]e (noun) → hou[z]e (verb), thie[f] (noun) → thie[v]e (verb). These nonconcatenative patterns are not productive. They are a sort of fossilized pattern limited to a small set of words and lack the potentiality for producing further instances of the same type.

6.3 Processing Borrowed Roots

One of the processes that contributes to shaping the morphological structure of the word is lexical borrowing. This process is severely restricted in Arabic. Arabicization is a translation approach that seeks to naturalize the shape of the target term by transforming it from the source language to Arabic. The necessity for Arabic equivalents to foreign words, particularly scientific terminology, prompted Arabicization's development. When a foreign word is being Arabicized, it fully acquires the properties of the Arabic word. For the present paper, the morphological properties are the ones that matter. Consider an Arabicized foreign word that fits with the Arabic morphological scale. A good example to illustrate lexical processing in Arabic is the Arabic word "marinat," which is the lexical

equivalent of the English word “television.” Arabic lexicology earlier introduced the word “marinat” to refer to television, but the word did not gain acceptability and conventionality and the Arabic speech community tended to use the English form. Arabic lexicology then turned to the process of Arabicization, where the target word was assumed to acquire Arabic linguistic properties. The English word “television” has two sounds that do not exist in standard Arabic (v and ʒ), so they were replaced by sounds that shared some identical articulatory features: respectively, ف ز.

The verb base form thus became quadruple, ز-ف-ل-ت, which corresponded with the English “t-l-v-z” respectively (only consonant sounds were considered because word roots in Arabic do not allow vowels). The final “n” was dropped because the Arabic verb root does not allow the pattern (“f-ʕ-l-l-n”). Thus, “t-l-v-z” copied the Arabic quadruple verb root “f-ʕ-l-l.”

English in contrast, lacks a similar mechanism of lexical borrowing to cover lexical gaps. No restrictions are imposed on loanwords because openness of vocabulary is a key characteristic of the English language. However, complications may appear later when these loanwords need to be processed morphologically and syntactically. Some illustrations of the Arabic lexically borrowed words “fatwa” and “niqab” might make this clear. “Fatwa” a decision or order made under Islamic law'(Oxford, n.d.), and “niqab” a piece of cloth that covers the face but not the eyes, worn in public by some Muslim women(ibid.).

“Fatwa” only accepts the plural morpheme ‘s’ to become “fatwas,” but not any other linguistic process. To form a verb from the root “fatwa,” one needs to add a semantically relevant verb: “issue fatwa.” Other inflectional processes affect only the verb “issue,” as in “issued fatwa” or “issuing fatwa.” Similarly, niqab is processed as “niqabs” and as “wear or put on niqab.”

7. Conclusion

Root properties in English and Arabic are at extreme ends because of the different morphological systems of the two languages. English is a typically concatenative language where roots and affixes are strung together sequentially in morphological processing. Arabic, meanwhile, has a nonconcatenative morphology. The concept of its root is associated with the process of “wazn” (pattern or schema). The function of “wazn” is to carry out the segmentation of the word pattern to determine the original letters and the additional affixes attached to it.

Findings revealed that the notion of root in Arabic is based on a general abstraction. The abstract formula (“f-ā-l”) is proposed as an empty root that allows for the generation of different forms using a set of affixes. In contrast, the root in English is a fully lexical form that will retain its semantic identity when all attached affixes are removed.

There are rare instances of similarity of morphological behavior reported in a few English nonconcatenative words, but they do not suggest productive patterns.

Exploring the similarities and differences between English and Arabic would provide important pedagogical implications. It could also highlight potential language learning and teaching difficulties.

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