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Nonconcatenative Morphology of MSA as Represented by Deverbal Verbs

Maisarah Almirabi

Umm Al-Qura University, Makkah, Kingdom of Saudi Arabia

mmmirabi@uqu.edu.sa

http://orcid.org/0000-0002-3409-1313

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الملخص

تتناول الدراسة الأفعال المزيدة في اللغة العربية واقتباسها من مصادر الفعل، وكيفيةُ توزيع أصوات الفعل المزيد على "الصرف اللاتتابعي-nonconcatenative morphology"؛ ولقد اعتنى اللغويون العرب أشدَّ العناية بشرح الأفعال المزيدة، ولم يجد الباحث بعد البحث والتحري ما يشابه تلك الكتابات والمؤلفات منشوراً باللغة الإنجليزية. وكما أن معرفة تغير معنى الفعل المزيد بالتزامن مع تغيير تركيبته مما يجذب عناية اللغويين؛ فقد وضَّح الباحث طريقة اقتباس الفعل المزيد باستخدام "الطبقات الصرفية المستقلة-autosegmental morphology". وتقوم الدراسة على جمع البيانات بالاستناد إلى: موقع (المكتبة الشاملة)؛ وذلك لجمع الأمثلة المستخدمة في البحث. وموقع (المعاني الإلكتروني)، وذلك للتأكد من سريان استخدام أمثلة الأفعال المزيدة. وخَلُصَت الدراسة إلى: أن معنى الفعل المزيد يشغل طبقةً مستقلةً عن طبقة معنى مصدر الفعل، وذلك ملاحظٌ عند مقارنة الفعل: "تَضَرَّب" [taDar:aba] مع الفعل "ضَرَب" [Daraba] مثلاً مع تأمل معنى المزيد "ضرَّب نفسه" في هذا المثال. وحيث أنه من المتوقع وجود فعلٍ مزيدٍ لكل مصدر فعلٍ إلا أن ذلك لم يكن مطابقاً للواقع، وقد عُزِيَ ذلك إلى "قواعد ترابط الأصوات العربية -phonotactics" وتعذر تركيب المعنيين-معنى المصدر مع معنى الزيادة "semantic oddities" في كلمة واحدة. كما يدعو الباحث أن يُتَناول موضوع الأفعال المزيدة بحثاً في لغات أخرى ذات صرفٍ مشابهٍ لصرف اللغة العربية باستخدام "نظرية مثالية البنية -Optimality Theory".

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Abstract

The present paper considers how the derivation of deverbal verbs occurs in Arabic, a language with nonconcatenative morphology. As Arabic linguists have carefully investigated Arabic deverbal verbs, English literature lacks such investigations. Demonstrating how a word modifies meaning while explaining the intriguing nonconcatenative morphology of Arabic are reasons for considering deverbal verbs. To illustrate the hierarchical structure of Arabic deverbal verbs efficiently, autosegmental analysis was used. Arabic manuscripts and Modern Standard Arabic (MSA) dictionaries, using the Alshamela search engine and the Almaany search engine, were consulted to create a list of deverbal verbs. The manuscripts were utilized to find the initial lists, while the dictionaries were used to filter the list to only include the current deverbal verbs. The author found MSA deverbal verbs are derived through nonconcatenative morphology. The meanings of deverbal verb particles were concluded to belong to an additional autosegmental tier that is distinct from the tier of the root meaning. Notice how the meaning of the deverbal verb تضرّب [taDar:aba] 'hit oneself' as an intransitive verb retains the root meaning of ضرب [Daraba] 'hit' and adds the deverbal meaning indicating the action happening to oneself. It had been expected that all the verb roots would interact with the deverbal verb templates; however, this was not the case. These morphological gaps were attributed to violations of MSA phonotactics or semantic oddities. Further investigation of the deverbal verbs, considering other languages with nonconcatenative morphology, while investigating the deverbal verb meanings from an Optimality Theory perspective, presents promising plans for future research.

Keywords: *Arabic morphology, autosegmental, deverbal meanings, Modern Standard Arabic, MSA, nonconcatenative morphology*

Introduction

Linguists have been interested in Arabic nonconcatenative morphology for decades. Although previous research written in English concerning Arabic verbs has focused on inflections, the study of Arabic verbs reveals derivation processes that indicate meaning change. The inflectional system in Arabic is based on standard grammatical rules. Conversely, the deverbal system arises in response to how people use it in practice. In this sense, in Arabic, the inflectional system is prescriptive, whereas the deverbal system is descriptive. This study analyzed the nonconcatenative morphology of triliteral deverbal verbs, focusing on how they are inflected in Modern Standard Arabic (MSA). It examined the morphological approach to representing morphological tiers in the presence of an added semantic dimension that is independent of the one represented by the root. The data sources consulted included classical and modern standard Arabic dictionaries, the Almaany dictionary, and Arabic books, accessed via a multi-thousand book search engine. Each deverbal verb represented a special meaning and valence. Some tokens were not verified by some deverbal verb templates, which can be attributed to phonological, semantic, and morphological compatibility.

Deverbal verbs serve diverse meanings. Such meanings are not added to indicate speech acts, i.e., the phenomenon of adding or changing the meaning of predicates to change a form classification by means of derivation.[1] Rather, their meanings are descriptive in the sense that the users of the language determine which morphophonological structures represent what lexical meanings. The structure of these meanings is nonconcatenative in nature. This is to say, the constellation of sounds that denote meaning is dispersed around the word.

Literature Review

The approach used to examine Arabic morphology has been conceptualized as word-to-word or stem-to-stem (McCarthy, 1993, McOmber, 1995, Ratcliffe, 1998, Benmamoun, 2003, Ussishkin, 2003). In this framework, the words [jaktubu:n] *they are writing presently*, [takatabna] *they wrote an agreement together*, [maktu:bun] *has already been written*, are all derived from the stem [kataba] *he wrote*. This approach to Arabic morphology has been adopted for the present study, as it emphasizes the relation between the stem and the related words, also indicating reasons for modifications to the form.

To indicate the nonconcatenative nature of Arabic morphology, McCarthy (1981) employed what was then an innovative approach, placing derivational affixation to resolve the problem of non-consecutive sounds belonging to a single morpheme. He established that Arabic bound morphemes should not be represented using a traditional linear system, as there is no rule governing whether they are attached to either or both sides of the word. He proposed a separate morphological tier to demonstrate how they are diffused around and in between the sounds of the stem. For example, a word such as [jaktubu:na] *write-3PL-MASC-PRE* is initially derived from the word [kataba] *write-3SG-MASC-PAST*, which also represents the root. Notice how the added and changed sounds and particles are not only attached to either end of the stem in such examples.

[1] An example of this in English is when deriving the causative, inchoative, and resultative forms from the adjective, e.g., straighten, straighten, and straightened, from straight.

Bisele and Eisele's (2002) analysis of Arabic verbs involved representing vowels and consonants without static values by implementing a marking system to indicate any vowel and any consonant. This approach to representing sounds is economical, revealing the word form before derivation and how the derived word arose. This representation offers a convenient way to compare the before and after forms.

Nonconcatenative morphology is a complex field, due to the many possible structures available (Fullwood, 2018). Verb to noun derivation has emerged as common in several studies (García, 2011; Gurevich et al., 2008; Ferrari-Bridgers, 2009; Taher, 2015; Tsujimura, 1992; Meinschaefer, 2005). However, deriving a verb from another verb and altering its meaning is significantly less common, as reported in studies such as Kangasmaa-Minn (1987), Kasık (1997), Vanhala (2022), and Grandi (2015). English deverbal verbs are formed by adding the prefix 'be-' to verbs, altering the meaning and valence of the original verb as in 'beblast' and 'beblind' (Cetnarowska, 1993; Kim et al., 1991; Nagano, 2013). Kim et al. (1991) illustrated how alternatives such as 'flied' and 'flew' can both represent the past of 'fly', with 'flied' used in specific contexts, such as in softball. Another aspect of deverbal verbs in English concerns the prefixation of verbs to form the negation particle before the verb meanings. For example, 'undress' and 'dislike', are derived from 'dress' and 'like', respectively (Cetnarowska, 1993). The additional meanings added as part of this deverbal process are found to add the meanings, to intensify, to cover, and to affect, among other meanings (Nagano, 2013).

Languages other than English offer various alternative fields for investigating deverbal verbs (Grandi, 2015; Kangasmaa-Minn, 1987; Kasik, 1997; Vanhala, 2022). For example, Estonian and Finnish deverbal verbs can be derived to transform intransitive verbs from transitive causative and transitive ones to intransitive reflexive and passive ones (Kasik, 1997). Prussian Lithuanian deverbal verbs have also been identified and evaluated; they add meanings such as 'to start' to alter the verb's root meaning (Vanhala, 2022). Italian deverbal verbs have also been noted to add some meaning to the original meaning of the verb; for example, the added meanings of 'insistence' and 'repetition' (Grandi, 2015). The added meanings of some functions attached to the verb have further been identified in Finno-Ugric languages. The deverbal verbs show an added meaning, changing from intransitive to transitive[2] (Kangasmaa-Minn, 1987).

Deverbal verbs in Estonian and Finnish, Prussian Lithuanian, Italian, and Finno-Ugric add an extra non-inflectional meaning to the meaning conveyed by the verb. Notably, all the deverbal verbs examined in these languages were created linearly, i.e., by concatenative affixation (Grandi, 2015; Kangasmaa-Minn, 1987; Kasik, 1997; Vanhala, 2022).

Methodology

This study initially involved collecting all deverbal verbs labeled مزيد [mazi:d] in Arabic by searching for the phrase الفعل المزيد [alfiʕlalmazi:d], '*the verb with added component*', in the Alshamela library. The reason for using this phrase is that المزيد [almazi:d] meaning *with added component*, is the word used to refer to the deverbal verb in Arabic, while the word الفعل [alfiʕl] specifies that the search includes a context related to verbs, excluding all other uses of the word المزيد [almazi:d]. The search was further modified to include books published since the 1900s

[2] The deverbal 'raise' is derived from rise, and chew is derived from bite for example.

(the period around which MSA was established), thereby including books in MSA. This aligns with Giolfo and Sinatora's (2018) dating of the establishment of MSA. Additionally, the search was modified to only include linguistics books, which made it possible to focus on technical linguistic discussion.

This search resulted in 6059 entries. Each of these entries was investigated in the relevant texts, and all the instances of deverbal verbs were added to the data for consideration. To determine which of these deverbal verbs are in current usage in MSA, each one was searched for using the Almaany search engine. All the results were found in the Almaany search engine. All relevant word entries were then included for further consideration, and all irrelevant cases excluded. Relevance was determined by whether the word entry related to deriving deverbal verbs from other verbs or not, i.e. whichever is related is relevant. Ten forms were found in the Alshamela library and nine as word entries in the Almaany search engine. The sources for the deverbal verb examples were found in Qabawah (1973), Juwaidi (2012), Alfatli (1985), Haroon (1988), Almidani (1993), Qabawah (1996), Alhamlawi (2020), Yaqub (2001), Alothaimin (2007), and Shiha (2022). This study presents ten forms illustrated in Table 1. The nine examples identified in the Almaany search engine are then exemplified in the subsequent tables, derivational rules, and autosegmental skeleton[3].

The resulting examples were approached employing a stem-to-stem and root-to-root derivation framework (McCarthy, 1993; McOmber, 1995; Ratcliffe, 1998; Benmamoun, 2003; Ussishkin, 2003). The derivation rules written in this study were adapted from Bisele and Eisele's approach (2002), because it affords a convenient demonstration of the basic modifications resulting from the derivation. For the autosegmental analysis, McCarthy's (1981) approach was adopted, integrating the autosegmental demonstration within a table, as explained in Almirabi (2021). The reason for using the autosegmental approach was to demonstrate the nonconcatenative nature of MSA. The modification by Almirabi (2021) is also important, as it offers a more extensive overview of the different factors that contribute to establishing MSA verbs.

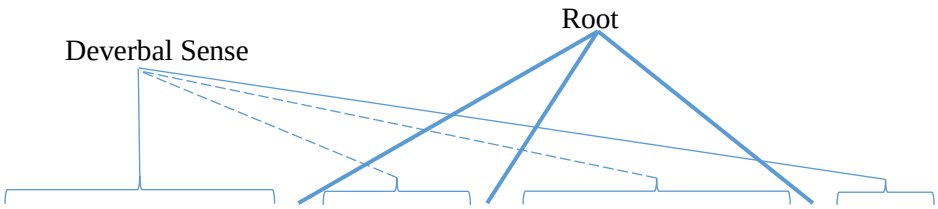
Data Analysis

Table 1 includes the templates of the most common deverbal verbs, depicting how their roots and additional meaning particles are distributed.

[3] The [faʕ:ala], [faʕala], [ʔafʕala], [tafaʕ:ala], [tafa:ʕala], [ʔinfaʕala], [ʔiftaʕala], [ʔifʕal:a], and [ʔistafʕala] are the ten forms found in Alshamela. Examples of all these forms were found in the Almaany except for [ʔistafʕala]. This necessitated investigating only nine of the ten forms.

Table 1

Distribution of Deverbal Particles around and within Verb Roots - Templates



فعل	f(a)ʕ(a)l(a)						f		a		ʕ		a				l		a
فَعَّلَ	[faʕ:ala]						f		a		ʕ	:	a				l		a
فاعَلَ	[faʕala]						f		a	:	ʕ		a				l		a
أفْعَلَ	[ʔafʕala]	ʔ	a				f				ʕ		a				l		a
تَفَعَّلَ	[tafaʕ:ala]	t	a				f		a		ʕ	:	a				l		a
تَفاعَلَ	[tafa:ʕala]	t	a				f		a	:	ʕ		a				l		a
اِنفَعَلَ	[ʔinfaʕala]	ʔ	i	n			f		a		ʕ		a				l		a
اِفْتَعَلَ	[ʔiftaʕala]	ʔ	i				f	t	a		ʕ		a				l		a
اِفْعَلَّ	[ʔifʕal:a]	ʔ	i				f				ʕ		a				l	:	a
اسْتَفْعَلَ	[ʔistafʕala]	ʔ	i	s	t	a	f				ʕ		a				l		a
اِفْعَوْعَلَ	[ʔifʕawʕala]	ʔ	i				f				ʕ		a	w	ʕ	a	l		a

Table 1 allows a comparison between the additional parts of the deverbal templates. It shows that alongside the three templatic consonants /f/, /ʕ/, and /l/, there is a templatic vowel, which always occurs between the second and third templatic consonants, resulting in Rule 1. This templatic vowel occurs in all the examples given, except for one found to be related to the template ʔiftaʕala. This was discussed when dealing with the template below. In addition, the stressed syllable is the one that precedes the final syllable in all the templates. Also, an optional syllable occurs prior to the stressed syllable. This syllable either starts with a glottal stop, which is phonetically omitted at normal speech rate, or with a voiceless alveolar stop. There is also a glottal stop to start the verb patterns, and all the deverbal verbs start with a stop consonant when the syllable is unstressed.

Rule (1)

CCaCa → (CV(C))ˈCV(C)C(VC)

Rule 1 summarizes all the attested forms of the deverbal verbs. It demonstrates that we can encounter a minimal number of three consonants in every verb, followed by a vowel, while the final syllable is either closed or has a second member in the consonant geminate. This creates from one to three closed syllables.

The autosegmental structures of the samples, which represent the different types of consonant-vowel distribution, were analyzed drawing on the several examples found in the aforementioned sources. Notably, not all the deverbal structures were possible, due to semantic oddness, complexity, or phonetic difficulties. Consider Table 2 for the acceptability of structure examples.

Table 2

Interaction of Different Structures with Added Deverbal Meanings - Templates and Examples

		Deverbal meaning and valence	template	No-vowel root (sound)[4]		Vowel-initial root (weak)		Vowel-medial root (weak)		Vowel-final root (weak)	
Root		structure	فعل f ʕ l	ضرب D r b	جمع ʒ m ʕ	أكل a k l	أمر a m r	تاب t a b	صام S a m	مشى m ʃ a	نسى n s a
		Root meaning →	-	hit	collect	eat	command	repent	fast	walk	forget
		Added Meaning ↓									
Deverbal forms	1	transitive, taking dative	فَعَّلَ [faʕ:ala]	ضرّب [Dar:aba]	جمّع [ʒam:aʕa]	أكّل [ʔak:ala]	أمّر [ʔam:ara]	توّب[5] [taw:aba]	صوّم [Saw:ama]	مشّى [maʃ:a]	نسّى [nas:a]
	2	transitive, taking sociative	فاعَلَ [fa:ʕala]	ضارب [Daraba]	جامع [ʒamaʕa]	أكل [ʔa:kala]	أمر [ʔa:mara]	-	-	ماشى [ma:ʃa]	ناسى [nasa]
	3	transitive (results in absolutive or benefactive)	أَفْعَلَ [ʔafʕala]	أضرب [ʔaDraba]	أجمع [ʔaʒmaʕa]	-	-	-	-	أمشى [ʔamʃa]	انسى [ʔansa]
	4	intransitive, taking agentive)	تَفَعَّلَ [tafaʕ:ala]	تضرّب [taDar:aba]	تجمّع [taʒam:aʕa]	تأكّل [taʔak:ala]	تأمّر [taʔam:ara]	-	-	تمشّى [tamaʃ:a:]	تنسّى [tanas:a:]
	5	intransitive, taking agentive and/ or ergative	تَفاعَلَ [tafa:ʕala]	تضارب [taDa:raba]	تجامع [taʒa:maʕa]	تأكل [taʔa:kala]	تأمر [taʔa:mara]	-	-	تماشى [tama:ʃa:]	تناسى [tana:sa:]
	6	passive-intransitive, taking essive case	اِنفَعَلَ [ʔinfaʕala]	انضرب [ʔinDaraba]	انجمع [ʔinʒamaʕa]	-	-	-	-	-	-
	7	intransitive, taking absolutive or benefactive	اِفْتَعَلَ [ʔiftaʕala]	اضطرب [ʔiDTaraba]	اجتمع [ʔiʒtamaʕa]	-	-	-	-	امتشى [ʔimtaʃa:]	انتسى [ʔintasa:]
	8	intransitive, taking translative	اِفْعَلَّ [ʔifʕal:a]	اضربّ [ʔiDrab:aa]	-	-	-	-	-	-	-
	9	intransitive, taking requestive	استفعل [ʔistafʕala]	استضرب [ʔistaDraba]	استجمع [ʔistaʒmaʕa]	استأكل [ʔistaʔkala]	استأمر [ʔistaʔmara]	-	-	استمشى [ʔistamʃa:]	-

The no vowel-root examples ضرب [D r b] and جمع [ʒ m ʕ] occurred with all deverbal meanings except for '*became flawed with*', due to semantic oddness. The roots أكل [a k l] and أمر [a m r] occur with those deverbals that do not start with a glottal stop, except when the glottal stop is not in the same syllable, in accordance with the phonotactics of Arabic. The roots تاب [t a b] and صام [S a m] occurred only with transitive, taking dative deverbals. Finally, the roots مشى [m ʃ a] and نسى [n s a] occurred with all deverbal forms, except when the meaning combined passive-intransitive, taking the essive case together with the intransitive, taking the translative. In other words, joining these meanings indicates a passive occurrence of self, becoming flawed due to semantic difficulty. Intransitive taking the requestive is another deverbal meaning, with no example of نسى [n s a], which is not marked by semantic, morphological, or phonetic constraints.

However, such an example was not attested to in the sources for the examples used in this paper, as noted above. The following derivational rules are given to illustrate the morphological processes occurring to the deverbals. The derivational processes of the deverbals فَعَّلَ [faʕ:ala], creating the transitive, taking dative and فاعَلَ [fa:ʕala] the transitive, taking sociative, are as demonstrated below in Rules (2) and (3).

[4] The parenthesized terms indicate the

[5] "توب: تَوَّب: حمله على التوبة، جعله يتوب (تكملة المعاجم العربية)" [taw:aba] means 'talked to someone to repent' or 'made him repent' (Almaany, retrieved 5/2/2023).

Rule (2)

$C_1aC_2aC_3a \rightarrow C_1aC_2{:}aC_3a$

Rule (3)

$C_1aC_2aC_3a \rightarrow C_1a{:}C_2aC_3a$

Both derivations share the same placement of the root constituents, with instances of gemination occurring at the onset consonant of the second syllable, and in the nucleus vowel also in the second syllable, as in Rules (2) and (3) respectively. The deverbal constituents occupy the nucleus positions for both syllables in both verbs, the coda position for the first syllable in the first verb, and the onset position for the second syllable in the second verb.

The deverbal أَفْعَلَ [ʔafʕala] '*results in absolutive or benefactive*' is derived from the root by applying Rule (4).

Rule (4)

$C_1aC_2aC_3a \rightarrow ʔaC_1C_2aC_3a$

This deverbal example has two closed syllables, the first of which starts with a glottal stop followed by a nucleus vowel to prevent the consonant cluster within the first syllable, ending with a consonant coda. The second syllable is also closed and has the second and third root constituents of the root template, occupying the onset and coda positions and surrounding the epenthetic vowel, also preventing the consonant cluster a. The deverbal constituent occurs in the onset of the first syllable and the nucleus position of the first and second syllables.

Rule (5)

$C_1aC_2aC_3a \rightarrow taC_1aC_2{:}aC_3a$

The first syllable has a voiceless alveolar stop as an onset, and the first and second root constituents occupy the onset and coda positions in the second syllable, respectively. The third syllable has a geminate onset as a copy of the second root constituent, and the third root constituent occupies the coda position in this syllable. The nuclei of the three syllables are epenthetic vowels that prevent consonant clusters. The deverbal constituent occurs in the coda positions in the three syllables, and in the onset of the third position.

The deverbal تَفاعَلَ [tafa:ʕala], the intransitive, taking agentive and/ or ergative, has three syllables; the first and second are open, and the third closed. Consider Rule (6).

Rule (6)

$C_1aC_2aC_3a \rightarrow taC_1aC_2aC_3a$

The first root constituent occupies the onset position for the second syllable. The second and third root constituents occupy the onset and coda positions in the third syllable. The

deverbal اِنفَعَلَ [ʔinfaʕala], the passive-intransitive, taking essive case, has three syllables. Consider Rule (7).

Rule (7)

$C_1aC_2aC_3a \rightarrow ʔinC_1aC_2aC_3a$

The first root constituent occupies the onset position for the second syllable. The second and third syllables occupy the onset and nucleus positions in the third syllable. The deverbal اِفْتَعَلَ [ʔiftaʕala], 'intransitive, taking absolutive or benefactive', also has three syllables, as expressed in Rule (8).

Rule (8)

$C_1aC_2aC_3a \rightarrow ʔiC_1taC_2aC_3a$

The first root constituent occupies the nucleus position for the first syllable. The second and third root constituents occupy the onset and nucleus positions in the third syllable respectively. The deverbal اِفْعَلَّ [ʔifʕal:a] '*became flawed with*' is a three-syllable verb. Consider Rule (9).

Rule (9)

$C_1aC_2aC_3a \rightarrow ʔiC_1C_2aC_3:a$

The first root constituent is in the nucleus position for the first syllable. The second and third root constituents occupy the onset and nucleus positions in the second syllable respectively. The third constituent is the first member of a geminate that extends across the syllable boundary, in this case between the second and third. The deverbal استفعل [ʔistafʕala], the intransitive taking requestive has its root constituent in the second and third syllables, as expressed in Rule (10).

Rule (10)

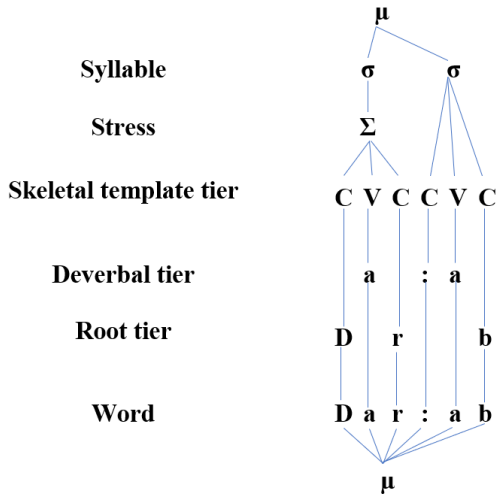
$C_1aC_2aC_3a \rightarrow ʔistaC_1C_2aC_3a$

The first root constituent occupies the nucleus position for the second syllable. The second and third root constituents occupy the onset and nucleus positions in the third syllable. The root that is found with all the deverbal forms is [taDar:aba]. This makes it convenient when used as an example to demonstrate the autosegmental tiers implied by the deverbal forms.

Differing from the common morphological tier structure, there is an additional tier, the deverbal tier. This tier represents the combination of vowels and consonants that comprise the deverbal particle of the verb. The autosegmental tiers in each deverbal form are detailed in the following figures. Figure 1 shows the autosegmental tiers of the deverbal verb ضرّب [Dar:aba] '*making others being hit*' as a transitive form, taking the dative verb.

Figure 1

The Autosegmental Tiers of ضرّب [Dar:aba]

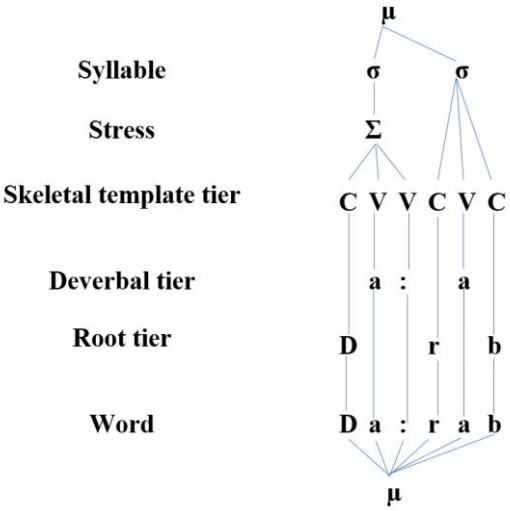


This deverbal verb has two syllables, the first being stressed. The final constituent in the first syllable is geminated with the first constituent of the second. The skeletal template indicates that each syllable comprises a closed syllable forming the CVC structure. The deverbal tier has two vowels surrounding a consonant resulting from gemination.

Another example is ضارب [Da:raba] '*shared hitting with others*' as a transitive form, taking the sociative verb remaining with two syllables, as shown in Figure 2.

Figure 2

The Autosegmental Tiers of ضارب [Da:raba]



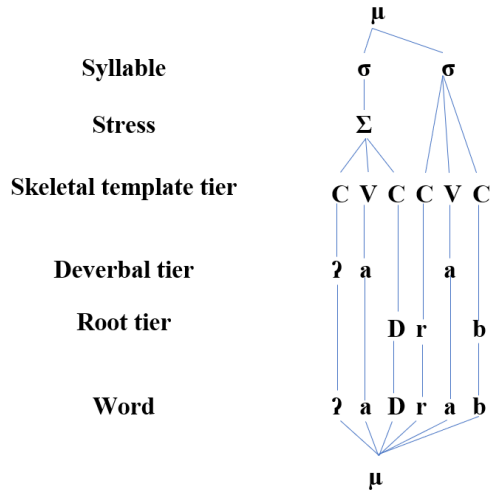
In this example, the stressed syllable is first. The template structure consists of an open syllable, with a geminated vowel followed by a closed syllable. The deverbal tier includes three vowels, the one in the middle is a result of gemination. The deverbal أضرب [ʔaDraba][6]

[6] Not to be confused with the homonymous word meaning 'went on a strike'.

‘*transformed hitting on others*’ is a verb that results in an absolutive or benefactive form, and consists of two closed syllables, the first of which is stressed (see Figure 3).

Figure 3

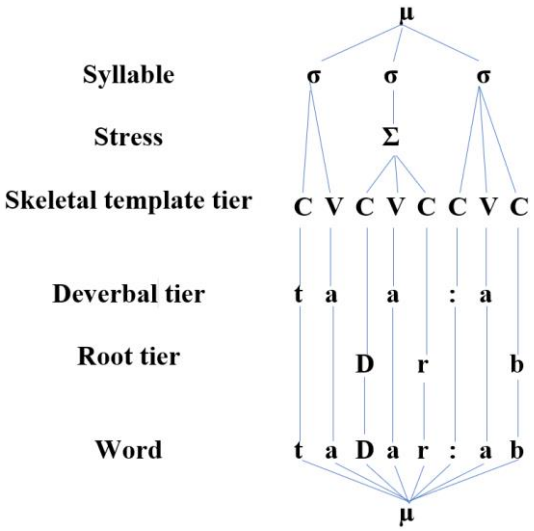
The Autosegmental Tiers of أضرب *[ʔaDraba]*



The deverbal tier includes an initial glottal stop and two syllable-medial vowels. The deverbal verb تضرّب [taDar:aba] means ‘*hitting is occurring on self*’ and is an intransitive verb with three syllables, the first of which is open and the others are closed. The second syllable is stressed, as demonstrated in Figure 4.

Figure 4

The Autosegmental Tiers of تضرّب *[taDar:aba]*

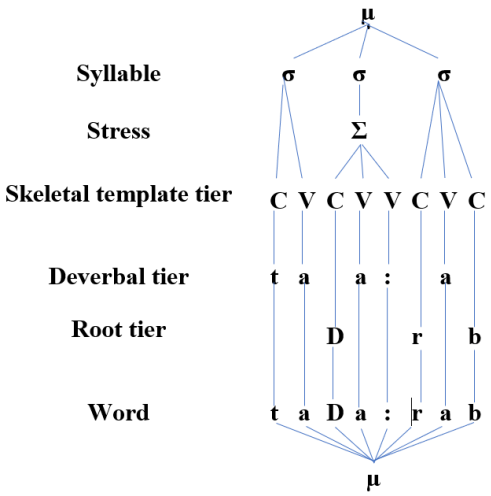


The deverbal tier includes an initial voiceless alveolar stop paired with a vowel. Another vowel occurs in the middle of the second syllable, and a further consonant occurs in the third syllable as a second member in a gemination. In addition, a vowel occurs in the middle of the third syllable.

The deverbal verb تضارب [taDa:raba] '*getting oneself involved in a hitting fight*' is an intransitive verb, taking the agentive and/or ergative. It consists of three syllables, the first and second of which are open and the third is closed (see Figure 5).

Figure 5

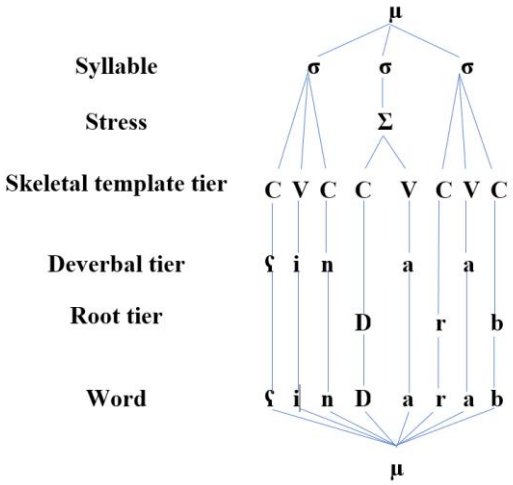
The Autosegmental Tiers of تضارب [taDa:raba]



The deverbal tier has an initial voiceless alveolar stop followed by three vowels. The deverbal verb انضرب [ʔinDaraba] '*got hit by someone else*' is a passive-intransitive verb, taking the essive case; it has three syllables the first and third are closed, and the second is open (see Figure 6).

Figure 6

The Autosegmental Tiers of انضرب [ʔinDaraba]

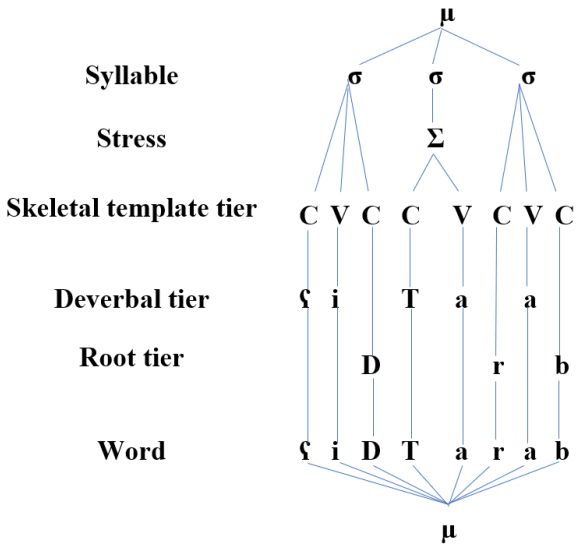


The deverbal tier begins with a glottal stop, vowel, and a nasal stop constituting a full syllable. In addition, it includes two vowels, occurring medial in the second and third syllables.

The deverbal اضطرب [ʔinDaraba] '*made hitting happens to oneself*', as a transitive verb taking the absolutive or benefactive, starts and ends with closed syllables, while in between there is an open syllable, as shown in Figure 7.

Figure 7

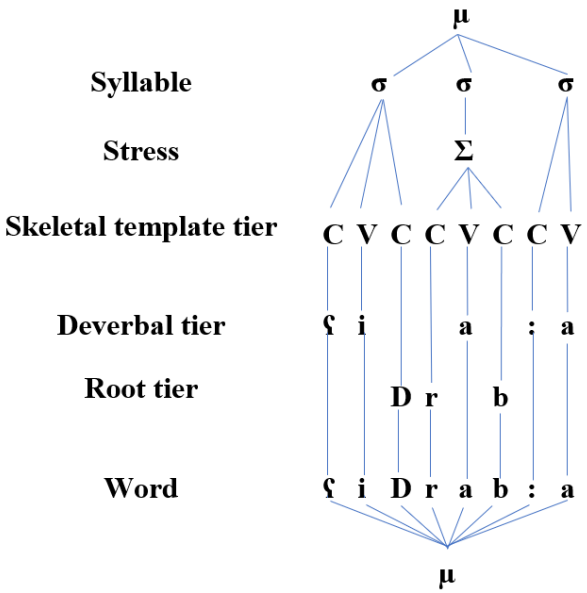
The Autosegmental Tiers of اضطرب [ʔinDaraba]



The deverbal tier includes two CV combinations in the first and second syllables, and only a vowel in the third. The first and second syllables in the verb اضربّ [ʔiDrab:a] '*became flawed with hitting*', as an intransitive, taking translative, and the third is open (see Figure 8).

Figure 8

The Autosegmental Tiers of اضربّ [ʔiDrab:a]

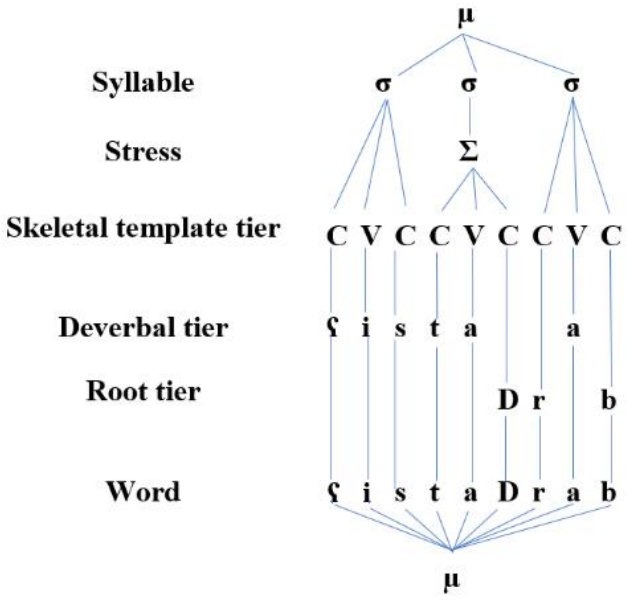


In this deverbal, the second syllable is stressed. Moreover, the deverbal tier is at the onset and nucleus of the first syllable, at the nucleus of the second syllable, and comprises all the third syllable. The onset of the third syllable is the second member in the geminate initiated

in the coda of the second syllable. The deverbal استضرب [ʔistaDraba] '*requested to be hit*', as an intransitive verb taking the requestive form, has three closed syllables in which the second is stressed (see Figure 9).

Figure 9

The Autosegmental Tiers of استضرب [ʔistaDraba]



The deverbal tier comprises the whole first syllable, the onset and coda of the second syllable, and the nucleus of the third syllable. Several examples of each of the deverbal templates demonstrate the systematic morphology of the derivation when adding the deverbal sense. Table (3) exemplifies autosegmental distribution of the deverbal template فَعَّلَ [faʕ:ala], which has the added deverbal meaning, is transitive, taking the dative.

Table 3

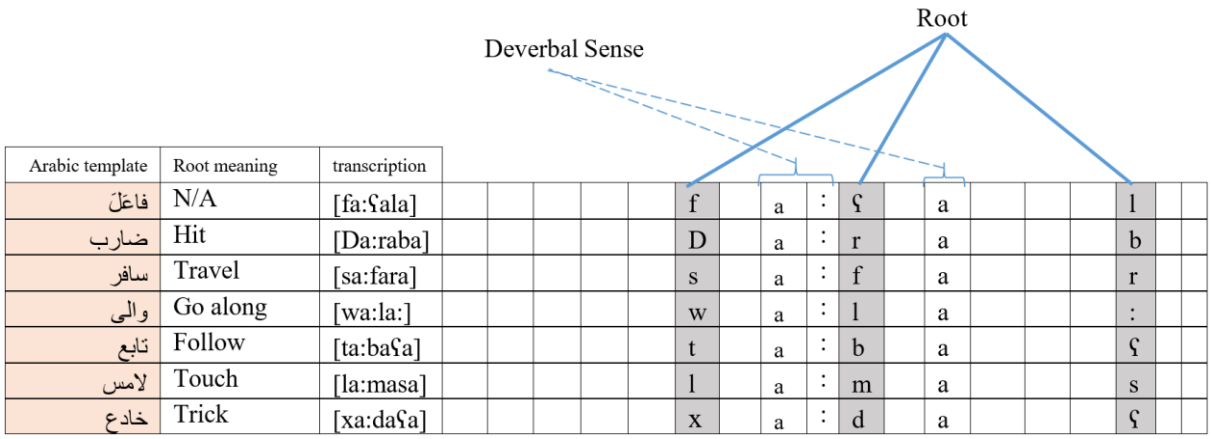
Distribution of Deverbal Particles around and within the Verb Root فَعَّلَ [faʕ:ala] – Examples

Arabic template	Root meaning	transcription																						
فَعَّلَ	N/A	[faʕ:ala]						f		a		ʕ	:	a				l						
قطّع	Cut (V)	[qaT:aʕa]						q		a		T	:	a				ʕ						
كسّر	Break (V)	[kas:ara]						k		a		s	:	a				r						
صبّح	Morning (V)	[Sab:aħa]						S		a		b	:	a				ħ						
فرّح	Happy (V)	[far:aħa]						f		a		r	:	a				ħ						
مرّض	Nurse (V)	[mar:aDa]						m		a		r	:	a				D						
خطّأ	Wrong (V)	[xaT:aʔa]						x		a		T	:	a				ʔ						

The deverbal sense affix is distributed in two places, being both the nucleus of the first and the second syllables, and the onset of the second. Table (4) provides examples of the autosegmental distribution of the deverbal template فاعَلَ [fa:ʕala], which means '*sharing or being involved in the state or action together*' is a transitive, taking a sociative verb.

Table 4

Distribution of Deverbal Particles around and within the Verb Root فاعَلَ [fa:ʕala] - Examples

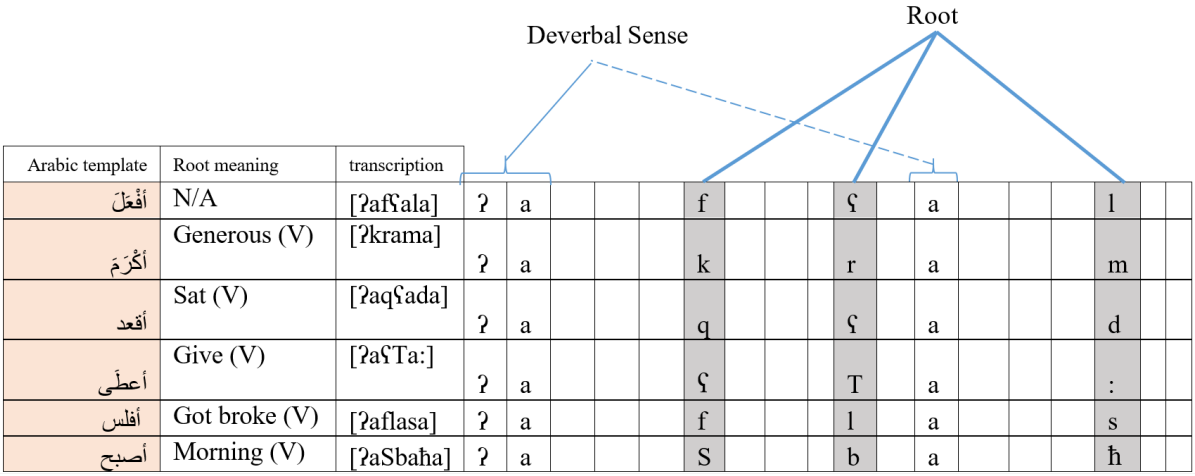


Arabic template	Root meaning	transcription																				
فاعَلَ	N/A	[fa:ʕala]						f	a	:	ʕ	a				l						
ضارب	Hit	[Da:raba]						D	a	:	r	a				b						
سافر	Travel	[sa:fara]						s	a	:	f	a				r						
والى	Go along	[wa:la:]						w	a	:	l	a				:						
تابع	Follow	[ta:baʕa]						t	a	:	b	a				ʕ						
لامس	Touch	[la:masa]						l	a	:	m	a				s						
خادع	Trick	[xa:daʕa]						x	a	:	d	a				ʕ						

The sense of the deverbal affix in Table (4) is distributed in two places, i.e., the nucleus and coda of the first syllable and the nucleus of the second. Table (5) demonstrates the distribution of the deverbal أفْعَلَ [ʔafʕala], which is then absolutive or benefactive.

Table 5

Distribution of Deverbal Particles around and within the Verb Root فاعَلَ [fa:ʕala] - Examples

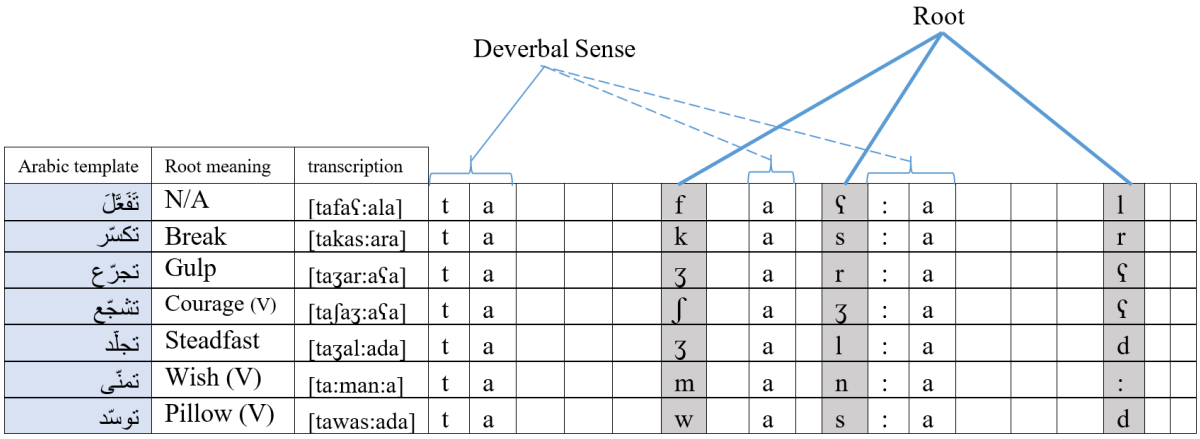


Arabic template	Root meaning	transcription																				
أفْعَلَ	N/A	[ʔafʕala]	ʔ	a				f			ʕ	a				l						
أكْرَمَ	Generous (V)	[ʔkrama]	ʔ	a				k			r	a				m						
أقعد	Sat (V)	[ʔaqʕada]	ʔ	a				q			ʕ	a				d						
أعطَى	Give (V)	[ʔaʕTa:]	ʔ	a				ʕ			T	a				:						
أفلس	Got broke (V)	[ʔaflasa]	ʔ	a				f			l	a				s						
أصبح	Morning (V)	[ʔaSbaħa]	ʔ	a				S			b	a				ħ						

The deverbal sense occupies the onset and nucleus positions in the first syllable and the coda of the second. Table (6) demonstrates the distribution of the deverbal constituents of the verb template تَفَعَّلَ [tafaʕ:ala], as intransitive, taking agentive.

Table 6

Distribution of Deverbal Particles around and within the Verb Root تَفَعَّلَ [tafaʕ:ala] – Examples

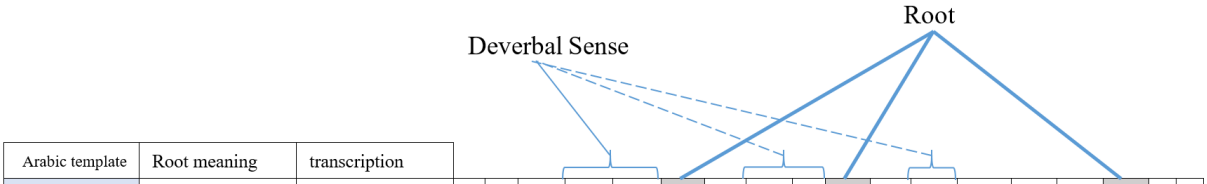


Arabic template	Root meaning	transcription																			
تَفَعَّلَ	N/A	[tafaʕ:ala]	t	a				f		a		ʕ	:	a				l			
تكسّر	Break	[takas:ara]	t	a				k		a		s	:	a				r			
تجرّع	Gulp	[taʒar:aʕa]	t	a				ʒ		a		r	:	a				ʕ			
تشجّع	Courage (V)	[taʃaʒ:aʕa]	t	a				ʃ		a		ʒ	:	a				ʕ			
تجلّد	Steadfast	[taʒal:ada]	t	a				ʒ		a		l	:	a				d			
تمنّى	Wish (V)	[ta:man:a]	t	a				m		a		n	:	a				:			
توسّد	Pillow (V)	[tawas:ada]	t	a				w		a		s	:	a				d			

The constituents of the deverbal root occupy the onset and nucleus positions within the first syllable, the nucleus of the second, and the onset and nucleus of the third. The root-deverbal sense distribution of the verb تَفاعَلَ [tafa:ʕala], being intransitive, taking agentive and/or ergative, is presented in Table (7).

Table 7

Distribution of Deverbal Particles around and within the Verb Root تَفاعَلَ [tafa:ʕala] – Examples

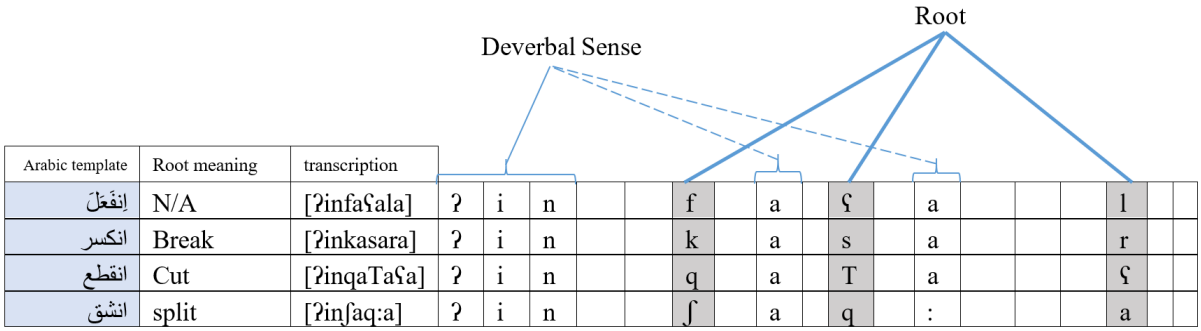


Arabic template	Root meaning	transcription																			
تَفاعَلَ	N/A	[tafa:ʕala]				t	a	f		a	:	ʕ		a				l			
تشاتم	Curse (V)	[taʃa:tama]				t	a	ʃ		a	:	t		a				m			
تباعد	Distance (V)	[taba:ʕada]				t	a	b		a	:	ʕ		a				d			
تزايد	Increase (V)	[taza:jada]				t	a	z		a	:	j		a				d			
تقارب	near (V)	[taqa:raba]				t	a	q		a	:	r		a				b			
تضارب	hit (V)	[taDa:raba]				t	a	D		a	:	r		a				b			
تعاظم	Mount up (V)	[taʕa:Zama]				t	a	ʕ		a	:	Z		a				m			

The deverbal sense occurs at the onset of the second and third syllables, and the coda of the third syllable. Table (8) demonstrates the distribution of the root and deverbal morpheme of the verb اِنفَعَلَ [ʔinfaʕala] as a passive action occurring to the 1st person.

Table 8

Distribution of Deverbal Particles around and within the Verb Root اِنفَعَلَ [ʔinfaʕala] - Examples

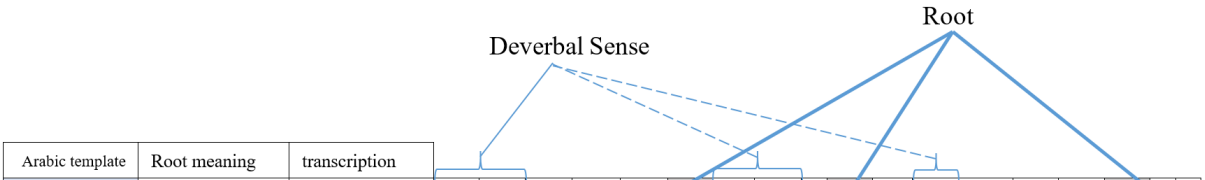


Arabic template	Root meaning	transcription																
اِنفَعَلَ	N/A	[ʔinfaʕala]	ʔ	i	n			f		a	ʕ		a				l	
انكسر	Break	[ʔinkasara]	ʔ	i	n			k		a	s		a				r	
انقطع	Cut	[ʔinqaTaʕa]	ʔ	i	n			q		a	T		a				ʕ	
انشق	split	[ʔinʃaq:a]	ʔ	i	n			ʃ		a	q		:				a	

The deverbal sense morpheme occupies the entire first syllable, and the nucleus positions of the second and the third syllables. Table (9) provides the morpheme distribution of the verb اِفْتَعَلَ [ʔiftaʕala] as intransitive, taking absolutive or benefactive.

Table 9

Distribution of Deverbal Particles around and within the Verb Root اِفْتَعَلَ [ʔiftaʕala] – Examples

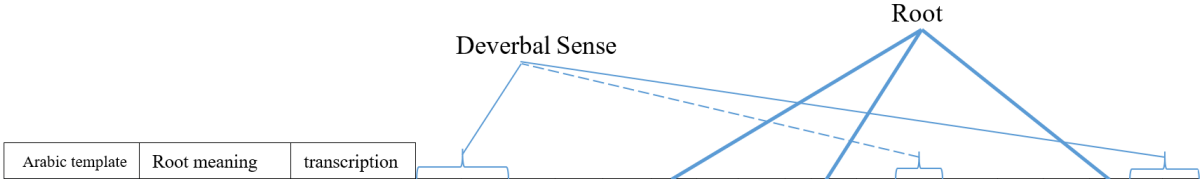


Arabic template	Root meaning	transcription																
اِفْتَعَلَ	N/A	[ʔiftaʕala]	ʔ	i				f	t	a	ʕ		a				l	
امتطى	Ride	[ʔimtaTa:a]	ʔ	i				m	t	a	T		a				:	
اجتمع	Gather	[ʔiʒtamaʕa]	ʔ	i				ʒ	t	a	m		a				ʕ	
اجتهد	diligent	[ʔiʒtahada]	ʔ	i				ʒ	t	a	h		a				d	
اقتتل	Fight	[ʔiqtatala]	ʔ	i				q	t	a	t		a				l	
ابتسم	Smile	[ʔibtasama]	ʔ	i				b	t	a	s		a				m	
اكتسب	earn	[ʔiktasaba]	ʔ	i				k	t	a	s		a				b	

The deverbal sense morpheme occurs in the onset and nucleus positions of the first and second syllables, as well as the nucleus position for the third syllable. The morpheme distribution of the deverbal اِفْعَلَّ [ʔifʕal:a] '*became flawed with*' is demonstrated in Table (10).

Table 10

Distribution of Deverbal Particles around and within the Verb Root اِفْعَلَّ [ʔifʕal:a] - Examples

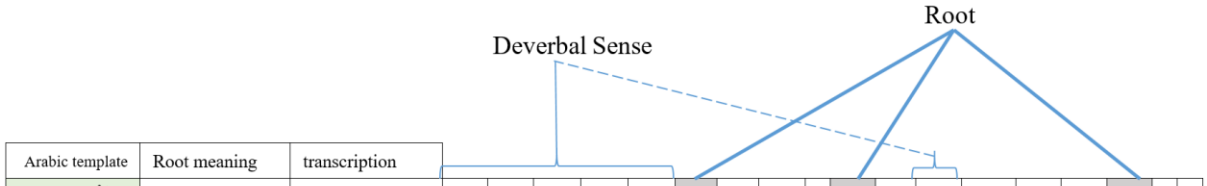


Arabic template	Root meaning	transcription																
اِفْعَلَّ	N/A	[ʔifʕal:a]	ʔ	i				f			ʕ		a				l	:	a
إحمرَّ	Redden	[ʔiħmara]	ʔ	i				ħ			m		a				r	:	a
اصفرَّ	Yellow	[ʔiSfara]	ʔ	i				S			f		a				r	:	a
إسودَّ	Blacken	[ʔiswada]	ʔ	i				s			w		a				d	:	a

The deverbal sense morpheme occurs in the onset positions in the first syllable, and the nucleus position in all other syllables. Table (11) demonstrates the morpheme distribution of the deverbal اِسْتَفْعَلَ [ʔistafʕala], which is intransitive taking requestive.

Table 11

Distribution of Deverbal Particles around and within the Verb Root اِسْتَفْعَلَ [ʔiftaʕala] – Examples



Arabic template	Root meaning	transcription																
اِسْتَفْعَلَ	N/A	[ʔistafʕala]	ʔ	i	s	t	a	f			ʕ		a				l	
استعد	Ready	[ʔistaʔad:a]	ʔ	i	s	t	a	ʔ			a		d				:	
استحجر	Quarantine	[ʔistaħʒara]	ʔ	i	s	t	a	ħ			ʒ		a				r	
استكرم	Generous	[ʔistakrama]	ʔ	i	s	t	a	k			r		a				m	
استكبر	Proud	[ʔistakbara]	ʔ	i	s	t	a	k			b		a				r	
استجاب	Reply	[ʔistaʒa:ba]	ʔ	i	s	t	a	ʒ			a		:				b	
استأجر	lease	[ʔistaʔʒara]	ʔ	i	s	t	a	ʔ			ʒ		a				r	

The deverbal morpheme occupies the onset, nucleus, and coda positions within the first syllable, the onset, and nucleus positions within the second syllable, and the nucleus position in the third syllable.

Findings

In the present study, different components of the deverbal elements were found to be distributed in different parts of the root, due to the nonconcatenative nature of Arabic morphology. The components of the trilateral verb root occur in both the onset and nucleus positions of the syllables of the verbs. They never occur in the coda position, which is reserved for deverbal components. The deverbal components always occur in the onset and nucleus positions when not occupied with root components. In every verb, there were attested to be at least three consonants, each of which is followed by a vowel, as demonstrated in Rule 1, which is repeated below for the readers' convenience.

Rule 1: CCaCa → (CV(C))ˈCV(C)C(VC)a

Notice how syllables can be closed or open, however, there should be an onset in each syllable. The meanings found to be added when deriving the deverbal verbs include:

1. transitive, taking dative;
2. transitive, taking sociative;
3. transitive, results in absolutive or benefactive;
4. intransitive, taking agentive;
5. intransitive, taking agentive and/ or ergative;
6. passive-intransitive, taking essive case;
7. intransitive, taking absolutive or benefactive;
8. intransitive, taking translative; and
9. intransitive taking requestive.

These meanings do not replace the root meaning but are integrated into it. For example, the verb root أكل [ʔkl] becomes أكّل [ʔak:ala] '*fed*', which differs from the past form of the verb أكل [ʔak:ala] '*ate*'. Notice that the deverbal verb retains the meaning of '*eating*'. Another example is the deverbal انسى [ʔansa] '*made forget*' derived from the root نسي [nsj], with the past tense of the verb as نَسيَ [nasi] '*forgot-INT*'. The '*forgetting*' aspect of meaning is retained in both verb derivatives of نسي [nsj]. A third example is derived from the root [ʔmr] 'order' to become استأمر [ʔistaʔmara] '*requested to be the one giving orders*'. The past tense of the verb is [ʔamara] '*gave an order*', and both the past tense and the deverbal verbs retain the meaning '*giving order*'. It emerged that deverbal verbs denote more than one meaning, i.e. the roots and the deverbal constituents' meanings. The root meaning differs from the added meaning that derives the deverbal element.

Some gaps in the root/deverbal verb meaning table were found, as reported in Table 2 above. This indicates that not all deverbal verb meanings occur with all verb roots. For example, the root صام [Sama] 'fast' does not occur with the root فاعَلَ [fa:ʕala] to add the meaning of a transitive verb.

Discussion

Previous studies on deverbal verbs in English have found that they are created to add meaningful elements that are not essential to the action or state, such as negation (García, 2011; Meinschaefer, 2005; Tsujimura, 1992). Deverbals in other languages were attested to, as in Estonian and Finnish, Prussian Lithuanian, Italian, and Finno-Ugric (Grandi, 2015; Kangasmaa-Minn, 1987; Kasik, 1997; and Vanhala, 2022). Cetnarowska (1993) suggests that deverbal verbs are derived by affixing the morpheme 're-' as an example. As deverbalization was not the focus of Cetnarowska's (1993) study, only a brief reference was made to it. Similarly, Nagano (2013) presented English prefixation in several examples, as illustrated by meaning postulates that capture the meaning of the deverbal verb, as in:

> "(5) a. be- + transitive base verb:
> to beblast X: "to affect X completely by blasting it"
> (> to blast X completely)
> to bespend X: "to affect X completely by spending it"
> (> to spend X to the full, waste X)" (p. 455)

The author also indicates that deverbal verbs are related to their verb counterparts by adding meanings such as intensification and transitivization, as in 'bedress' and 'bedwell' respectively. Correspondingly, Kangasmaa-Minn (1987) demonstrated that derivational processes in Finno-Ugric languages lead to different meanings. Kim et al. (1991) referred to deverbal verbs as verbs that have verb roots such as flied/flew and crept/creeped with the roots "fly" and "creep," respectively. This study focused on language acquisition and provided a brief analysis of deverbal verbs.

Word formation in Italian was found to be cumulative, as illustrated by the use of tree diagrams (see Figures). Utilizing Optimality Theory, the author demonstrated how deverbal affixation is optimal in some Italian dialects and not in others (Gandi, 2015). By comparing deverbal verb derivation in Finnish and Estonian, Kasik (1997) found that affixation by

repetition occurs in Finnish but not in Estonian. This was demonstrated by utilizing stem-to-stem demonstration. Earliest Lithuanian texts from various periods were examined, revealing that some deverbal verb affixation had been utilized but later abandoned. This was illustrated as a stem-to-stem process occurring in diachronically related languages (Vanhala, 2022).

Previous studies that referred to and/or analyzed deverbal verbs have considered them from various perspectives, such as semantics, language acquisition, optimality theory, or even stem-to-stem morphological analysis. Conversely, none of them illustrated how the different tiers of meaning interact to derive deverbal verbs. Autosegmental analysis is particularly practical with deverbal verbs[7]. Utilizing this approach enhances the significance of the present study.

Additionally, the examples reported and attested to in previous studies show deverbal particles were used as whole chunks affixed to words. In the present study, the manner of affixing deverbal particles differed from what had been found in previous studies due to the nonconcatenative nature of MSA. This phenomenon was attested by McCarthy (1981), allowing him to introduce the autosegmental analysis of Arabic. The field of deverbal verbs in Arabic had not been visited by researchers before the present paper was written. When considering deverbal verbs in Arabic, several issues are expected to arise, as discussed in the conclusion section below.

Conclusion

This study found that deverbal components occupy a special tier of morphology since they derive special meanings using special structures found in different examples. This is emphasized by the two meanings being of differing types, i.e., the root meaning which is essential to the word, and the added meaning that is used to derive the deverbal meaning. Significantly, some of the deverbal verbs that were not found in the sources considered were attributed to semantic and phonological difficulties, since the meaning or sound combinations were not expected to make sense or to follow the phonotactics of the language.

It was expected that all the slots in Table 2 would have been filled with deverbal verbs representing the derivation processes of the tackled verbs. However, an alternative explanation for some of these structural gaps was proposed, suggesting that the distribution of the deverbal particle within and around the verb root could have resulted in forms that violate MSA phonotactics. An explanation for the remaining gaps was proposed, indicating that the combination of the root and the deverbal particle meanings could have led to semantic oddity. For example, the verbs [Sama] ‘fast’ and [maʃa] ‘walk’ were not found to interact with [ʔafʕal:a] and [ʔinfaʕala] to produce the deverbal verbs [ʔaSwam:a]* and [ʔinmaʃaaa]* respectively. In these examples, [ʔaSwam:a]* comprises semantic oddity as fasting is a voluntary performance that cannot be transitive[8], and with [ʔinmaʃaaa]* the vowel hiatus is disallowed in MSA based on the language phonotactics (Naaser and Saranya 2020).

The present study investigated the effects that arise when combining deverbal verbs with nonconcatenative structures of MSA, filling in some of the theoretical gaps within the

[7] The importance of deverbal verbs to be analyzed from an autosegmental perspective lies in the fact that they encompass two meanings: the meanings of the root and the deverbal particle.

[8] The performance of fasting is voluntary when considering the literal sense of the word according to the Oxford English Dictionary online (OED) (retrieved 1/2/2024).

morphology. In future research, exploring other languages with a nonconcatenative morphology, such as Hausa and Bata, by utilizing the autosegmental structure while processing deverbal meanings through Optimality Theory analysis would offer an interesting project to expand upon the conclusions outlined here concerning deverbal verbs.

Bio

Maisarah M. Almirabi obtained his Ph.D. in Applied Linguistics at Ball State University in Muncie, Indiana, USA in 2019. He obtained his master's degree in Linguistics at the University of New Mexico in Albuquerque, New Mexico, USA in 2013. He obtained his bachelor's degree in the English Language at Umm Al-Qura University, Makkah, Saudi Arabia, in 2009. He is currently an Associate Professor in the Department of English at Umm AlQura University (the main branch) in Makkah, Saudi Arabia. His research focuses on cognitive linguistics, Conceptual Metaphor Theory, pragmatics, and morphology. Further information can be found at: https://uqu.edu.sa/Profile/mmmirabi

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Appendix

Arabic Sound Representation Symbols

Consonants			
Arabic Letter	Sound Symbol	Arabic Letter	Sound Symbol
ء	ʔ	ض	D
ب	b	ط	T
ت	t	ظ	Z
ث	θ	ع	ʕ
ج	ʒ	غ	ʁ
ح	ħ	ف	f
خ	χ	ق	q
د	d	ك	k
ذ	ð	ل	l
ر	r	م	m
ز	z	ن	n
س	s	ه	h
ش	ʃ	و	w
ص	S	ي	j

Vowels		
i		u
e	ə	o
a		