On Semitic Denominal Verbs: The Case of Arabic and Hebrew

1 author:

Abdullah S Al-Dobaian
King Saud University
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Abstract.

I argue that the noun in denominative verbs in Arabic and Hebrew is a lexical indivisible part of the verb. Evidence for the lexical analysis of denominal verbs is based on lexical, semantic, and syntactic arguments. I argue that, unlike the lexical analysis, Baker's syntactic analysis of denominative verbs fails to account for the lexical properties of denominative verbs particularly the lack of referential index of the noun and the non-ambiguity of these verbs with adverbs.
Furthermore the dual projection of a verb and a noun in syntax as assumed by the syntactic analysis violates syntactic principles.

الأفعال المشتقة عن أسماء في اللغات السامية : حالتا العربية والعبرية

ملخص البحث:

يبين هذا البحث أن الإسم في الأفعال المشتقة عن أسماء (denominative verbs) في العربية والعبرية جزء لا يتجزأ من البنية المفرادتية (lexical structure) للفعل . يأتي البرهان على التحليل المفرداتي للأفعال المشتقة عن أسماء بناءً على حجج مفرادتية ودلالية ونحوية . ويناقش البحث تحليل Baker النحوي فيثبت أن تحليله للأفعال المشتقة عن أسماء يعجز عن أن يفسر خصائص تلك الأفعال المفرداتية ولاسيما الدليل الإحالي (erential indexref) كما يفشل تحليل Baker أيضاً في تبرير عدم غموض تلك الأفعال دلالياً عند استخدامها مع ظروف المكان والأحوال والتي يفترض هذا التحليل أن تكون تلك الأفعال غامضة ومتعددة المعنى. وبالإضافة لذلك فإن هذا التحليل النحوي للأفعال المشتقة عن أسماء يعرض كل من الإسم والفعل كوحدتي إسناد مستقلتين على المستوى النحوى (two syntactic predicates) وهذا يخالف القوانين النحوية مما يضعف من تحليل Baker ويجعل التحليل المفرداتي التحليل الصحيح الذي يتغلب على كل الإشكاليات التي تواجه التحليل النحوي .

Introduction

Denominal verbs are complex verbs that pose interesting questions on the morphology-syntax interface. In one hand, denominal verbs raises a challenging question regarding the place of morphology in the modern linguistic theory? In other words, at what level of the grammar are these types of verbs formed? Are they derived at syntax or at the lexicon? Needless to say that complex words was a debatable issue that divided linguists into two camps. The lexicalists[1] argue that morphology is performed at the lexicon and not in syntax. However the other camp of linguists, under the influence of Baker[2], assumed that morphology is controlled by syntax. Is there a way to make a distinction among syntactic and lexical characteristics of word formation processes?

The close examination of a denominal verb structure can explain the intricate relationship of a morphologically complex word with the lexicon and syntax. Additionally, the study of denominal verbs in Semitic languages proves to be fruitful because it shows how verb semantics interacts with the verb syntax based on the use of modifiers.

In this paper, I argue that denominal verbs in Arabic and Hebrew are lexically formed as a result of different pieces of argument. The evidence is based on lexical, syntactic and semantic arguments all proving that denominal verb is used syntactically as one complex word. Hence syntactic operations like modification or reference cannot access the internal structure of denominal verbs as I argue below.

The paper is organized as follows: the first section gives a basic background on Arabic and Hebrew denominal verbs. In the second section I discuss the lexicon's role in the formation of denominal verbs. The third section gives the syntactic evidence of the lexical analysis of denominal verbs. The semantic evidence is

[1] See E. Selkirk, *The Syntax of Words* (Cambridge: MIT Press, 1982) and A.-M. Di Sciullo and E. Williams, *On the Definition of Word* (Cambridge: MIT Press, 1987).

[2] See M. C. Baker, *Incorporation: A Theory of Grammatical Function Changing* (Chicago: University of Chicago Press, 1988).

shown in the fourth section. The final section illustrates that Baker's analysis of compounds in terms of the syntactic merger of the two heads of the denominal verb cannot possibly work. I argue that only the lexical analysis proves to account for the semantic, syntactic and lexical facts of the denominal verb.

1. Basic Background

In this background, I gave a brief introduction on the morphology of the verb in Hebrew and Arabic. Then I briefly explain the basic structure of denonimal verbs with illustrative examples.

1.1 The International Phonetic Alphabet (IPA)

It is standard in modern linguistics to use the IPA to represent all the distinctive sounds of different languages[3]. IPA uses a set of symbols and diacritics along with ordinary roman letters. Following this basic linguistic tradition, I represent the Arabic and Hebrew examples in the IPA symbols. The distinctive Semitic sounds that distinguish Arabic and Hebrew are transcribed in IPA in the following table:

(1) Table of IPA symbols[4]

Place of Articulation	pronunciation	IPA symbol
dental	ث	ɵ
	ذ	ð
alveolar	ط	t̪
	ض	d̪
	ص	s̪
postalveolar	ش	ʃ
velar	خ	x
	غ	ɤ

[3] P. Ladefoged, *A Course in Phonetics*, (Orlando: Harcourt Brace Jovanovich College Publishers, 1993), p. 275-280.

[4] These symbols are taken from Ladefoged, *A Course in Phonetics*, p. 164.

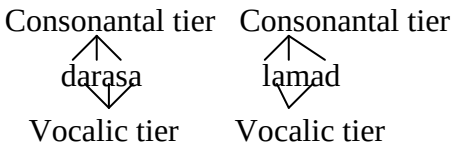
uvular	ق	q
pharyngeal	ح	ħ
	ع	ʕ
glottal	أ	ʔ

The symbols in table (1) only represent the distinctive sounds that distinguish the Semitic languages. The IPA transcribes regular sounds that Semitic languages share with other languages into regular roman letters such as [t, s, m, n…].

1.2 Semitic Verb Morphology

Arabic and Hebrew show share the same morphological system. The Semitic morphology is considered to be *non-concatenative* in which the consonants and the vowels occupy their independent morpheme or tier.[5] Let us consider of the verb *learn* in Arabic and its equivalent counterpart in Hebrew respectively:

(2) **The morphological structure of *learn* in Arabic and Hebrew**



As we can see in (2), the consonant are on tier or a *Consonantal tier* while the vowels are on a *Vocalic tier*. The segments of each morpheme are arranged in a non-consecutive manner.

Not only do Semitic languages like Arabic and Hebrew for example have the same morphological system but also both languages resemble each other in their

[5] See J. McCarthy, *Formal Problems in Semitic Phonolog and Morphology* MIT Ph.D. dissertation, distributed by Indiana University Club (New York: Garland Press, 1985), p. 130-131.

basic verb system.[6] Below I show the basic Hebrew verb forms or *binayim* that are similar to Arabic.[7]

(3) **Hebrew Verb Forms**

Verb form	Example	Function
Pa‫ع‬al	qatal 'killed'	active
Pi‫ع‬‫ع‬il	limmed 'taught'	causative
Pi‫ع‬il	miqqem 'put in place'	factitive
Hif‫ع‬il	hiqtil 'cause kill'	causative
Hif‫ع‬il	himlix 'make king'	factitive

Pa‫ع‬al is the Hebrew basic verb[8] and is identical to the unmarked Arabic verb *fa‫ع‬ala*.[9] This form is referred to in the Semitic studies as a b-stem or a base-stem.[10] *Pi‫ع‬‫ع‬il* is just like the Arabic verb form *fa‫ع‬‫ع‬ala*. This form is formed by doubling */‫ع‬/*, the second radical of the root; hence the stem is called a d-stem.[11] D-stem may have two functions: causative and factitive. The causative is derived from a regular verb. However a factitive d-stem is formed from a noun and indicates that the causee of the verb is in the state of the underlying noun.[12]

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[6] See A. Goetze, "The so-called Intensive of the Semitic Languages," *Journal of the American Oriental Society*, 62, (1942), p. 1.

[7] See S. Bolozky, "Word Formation Strategies in the Hebrew Verb System: Denominative Verbs," *AfroasiaticLinguistics*, 5/3, (1978), p.3.
See S. Bolozky, "Strategies of Modern Hebrew Verb Formation," *Hebrew Annual Review*, 6, (1982), 69-79.
See also Goetze, "The so-called Intensive", p. 1.

[8] See Goetze, "The so-called Intensive", p. 1

[9] The verb form *Pa‫ع‬al* or *fa‫ع‬ala* consists of three consonants *f ‫ع‬l* where */p/* or */f/* refers to the first radical of the root, */‫ع‬/* to the second radical, and */l/* to the third radical. See Bolozky, "Word Formation Strategies", Bolozky's footnote 2, p. 3.

[10] S. A. Ryder, *The D-Stem in Western Semitic* (Mouton: The Hauge, 1974), p. 11 and 24.

[11] Ryder, *The D-Stem*, p. 23.

[12] T. Mentcher, "Expression of Causativity in English and Hebrew," in *Language Across Cultures*, 8-9, (1983), 155-169.

Finally Hifʔil is similar to the Arabic verb form *afʕal*. *Hifʕil* and *afʕala* are called *H-stem*.[13] This form has a causative/ factitive distinction.[14]

1.3 Semitic Denominal Verbs

Given the similarity of the morphological system between Arabic and Hebrew, it is not surprising that they share similar morphological structures. One of such structures that both languages share is *denominal* verbs.

Denominal verbs are those verbs that are derived from nouns. Starting first with Hebrew, I show below the different forms of denominal verbs and some representative examples:[15]

(4) **Hebrew Denominal Verb Forms**

Verb form	Base Noun →	Denominal Verb
1. PiʕʕiI	davar 'word'	dibber 'to speak'
	mamon 'money'	mimmen 'to finance'
2. Hifʕil	melex 'king'	himlix 'to make someone king'
	maʃze 'play'	himʃiz 'to make (novel) into a play
3. Hitpaʕʕil[16]	yaded 'friend'	hityaddid 'to befriend'
	merkaz 'centre'	hitmarkkiz 'to concentrate'

As for Arabic, the forms of the denominal verbs are as follows.

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[13] F. Leemhuis, *The D and H Stems in Koranic Arabic* (Leiden: Netherlands, 1977), p.1.

[14] Mentcher, "Expression of Causativity", p.162.

[15] These denominal verbs are taken from Bolozky, "Word Formation Strategies", p. 8, 9. Bolozky, "Strategies of Modern Hebrew Verb Formation", p. 74. Ryder, *The D-Stem*, p. 94.

[16] Hitpaʕʕil is the intransitive passive of Piʕil. See R. A. Berman, 1979, "Lexical Decomposition and Lexical Unity in the Expression of Derived Verbal Categories in Modern Hebrew," *Afroasiatic Linguistics*, 6/3, (1979), 1-26.

(5) **Arabic Denominal Verb Forms**[17]

Verb form	Base Noun	→	Denominal Verb
1. faʕʕala فَعّلَ	jayeʃun ‘an army’		jayyaʃa ‘make an army’
	Jildun ‘skin e.g. of an animal’		jallada ‘bound e.g. a book
2. ʔafʕala أفْعَل	ɵamarun ‘a fruit’		ʔaɵmara ‘bore a fruit’
	labanun ‘buttermilk’		ʔalbana ‘to have buttermilk’

It is interesting to observe from the above examples that both Hebrew and Arabic form denominal verbs in D-stem verbs (*PiʕʕiI* and *FaʕʕaIa*) as well as in *H-stems* (*HifʕʕiI* and *ʔafʕaIa*). The similarity of denominal forms in Arabic and Hebrew strongly suggests that the word formation process of the denominal verb might be also similar. I argue that this is exactly the case and present many pieces of argument in the following sections in favor of the lexical formation of denominal verbs.

2. The lexicon of Denominal verbs

I argue in this section that denominal verbs in Arabic and Hebrew are best analyzed by being formed at the lexicon. Support for the lexical nature of such verbs comes from the lexical properties based on irregular gaps represented by the lack of verb bases. Another argument is the semantic unpredictability of denominal verbs.

2.1 Lexical gaps

Chomsky[18] argued against Generative Semantics that assumed a syntactic or a transformational analysis to word formation. He argued that derived nominal like

[17] For more examples, see W. Wright, *A Grammar of the Arabic Language* (Cambridge: Cambridge University Press, 1974), p. 32 and 35. To determine the precise pronunciation of the sounds of Semitic words, see the table of IPA in (1) above.

[18] N. Chomsky, “Remarks on Nominalization,” in *Studies on Semantics in Generative Grammar*, (1972), Mouton: The Hague, p.21.

belief cannot be derived via transformation from *believe*. He proved that derived nominals are lexically formed based on its lexical gaps and its semantic unpredictability. Following Chomsky's line of thinking, I assume that denominal verbs are lexically formed based on their lexical unpredictability. To illustrate denominal verbs are derived from nouns and lack base verbs (faʕala or PaʕaI). Let us first start with Hebrew[19]:

(6) **Hebrew Denominal verbs**

Noun	Denominal verb
a. riqqud 'dance'	_____
b. melex 'king'	himlix[20] 'to make someone king'
c. ʔoxl 'food'	_____
d. yadid 'friend'	hityaddid 'to be friend'
e. telbbuʃit 'dress'	_____

The nouns in (6 b, d) have the denominal verbs *himlix* and *hityaddid*. These nouns do not have a base verb. Instead they are derived from nouns, hence they are called *denominal* verbs. On the other hand, the nouns in (6) a, c, e do not develop denominal verbs since these nouns have basic *PaʕaI* forms[21] as (7) shows:

(7) **Hebrew Non-Denominal verbs**

PaʕaI Verb	HifʕiI
a. raqad 'dance'	hirqid 'cause dance'
b. ʔaxal 'eat'	haeʔaxil 'cause to eat'

[19] I would like to thank Dr. Ibraheem Nasraddiin Dibikee and Dr. Mohammed Al-Hawary for their significant help in the Hebrew examples.

[20] A reviewer suggests that *himlix* may have a base verb like *malax* 'to make a king'. Nonetheless Dr Dibikee indicated to me that *himlix* and *malax* are both derived from the noun *melex* 'king' suggesting that these two verbs are denominal since they are derived from a nominal source.

[21] Examples are taken from G. N. Saad and S. Bolozky, "Causativization and Transitivization in Arabic and Modern hebrew," *Afroasiatic Linguistics*, 9/2, (1984), p. 34).

c. lavash ‘wear’ hilbish ‘cause to wear, dress someone)

The nouns in (6) have basic *paʕal* verbs in (7); therefore, such nouns do not form denominal verbs. These *paʕal* verbs can develop the regular causative verbs in *Hifʕil* form[22]. There is no regular rule that determines what nouns have denominal verbs and what nouns do not. As a result, certain nouns have to be lexically specified to take denominal verbs. Such list of irregular verbs is then memorized by native speakers.

Now let us consider Arabic[23]:

(8) **Arabic Denominal verbs**

Noun	Denominal verb
a. raqas ‘dance’	_____
b. jaish ‘army’	jayysha ‘make an army’
c. ʔakl ‘food’	_____
d. jild ‘skin (an animal)’	jallada ‘bound (a book)’
e. libs ‘dress’	_____

As the case in Hebrew, Arabic nouns in (8b,d) form denominal verbs. Since there is no *faʕala* base verb, the verb has no other way but to be derived from the noun. On the other hand, the nouns in (8a, c, e) lack denominal verbs as indicated by the gap because the nouns have basic *faʕala* verb forms as (9) shows:

(9) **Arabic Non-Denominal verbs**

FaʕIala	Causative
a. raqasa ‘dance’	raqqasa ‘caused to dance’
b. ʔakala ‘ate’	ʔakkala ‘caused to eat’

[22] It is worth mentioning that unlike denominal verbs that are irregularly derived from some nouns, pa√al verbs produce causatives in Hifʕil form more productively as (7) shows. The examples in (7) are taken from Saad and Bolozky, “Causativization,”. P. 34

[23] The denominal verbs in (8) are taken from Wright, *A Grammar of the Arabic Language*, p.32. Wright observes that such verbs are derived from nouns.

c. labasa ‘dressed’ labbasa ‘caused to dress’

The nouns in (8a, c, e) have basic *faʕala* verbs as (9) illustrates. Hence no denominal verb is derived. Unlike the case in a denominal verb, the causative *faʕʕala* is formed directly and more productively from the *faʕala* verb.

We can conclude that denominal verbs in Arabic and Hebrew are derived from nouns since they lack base verbs. There is no regular rule that can predict the formation of denominal verb. Instead the formation of a denominal verb is lexically restricted because some nouns choose to develop a denominal verb while others simply do not.

2.2 Semantic unpredictability

We observed in the previous section that the formation of denominative verbs is irregular. Not every noun can derive a denominative verb but only those nouns that lack a basic *faʕala* or *PaʕaI* form. Therefore the formation of denominative verbs is determined lexically. Beside lexical gaps, another strong indication of the lexical nature of the denominal verb is the unpredictability of its meaning. The denominatives have unpredictable meanings. The noun itself irregularly determines the meaning of the denominative verb. In fact the meaning of the denominative verb varies depending on the underlying noun[24]. Below I explain three different meanings of denominal verbs. As-sayyed refers to theses meanings in Arabic.[25]

1. Acquiring a quality or a state:

The denominal verb can express a quality or state of the original noun from which the verb was derived. Let us consider examples from Hebrew and Arabic:

[24] For the possible meanings of denominal verbs, see Wright, *A Grammar of the Arabic Language*, p.35.

[25] A. M. as-Sayyed, *al-Mughni fii ʕilm as-Sarf* (College of Science and Arts: al-Hashimyyah University, 1988), 136-141.

(10) a. **Hebrew Denominal verbs**

Noun	Denominal verb
birex ‘blessing’	birrix ‘make blessing’
sheivaħ ‘praise’	shibbaħ ‘make praise’

b. **Arabic Denominal verbs**

Noun	Denominal verb
ʕarabyyun ‘an Arab’	ʕarraba ‘make an Arab or Arabian’
najdatun ‘aid’	ʔanjada ‘make aid’

The verbs in (10) express states or qualities ‘i.e. blessing, Arab…’ represented by the nouns deriving these verbs.

2. Obtaining or having something

Another meaning of the denominative verb is to express having or obtaining the noun as the following examples illustrate:

(11) a. **Hebrew Denominal verbs**

Noun	Denominal verb
ʃavac ‘heart attack’	hiʃtavec ‘have heart attack’[26]
pri ‘a fruit’	hifra ‘bore a fruit’

b. **Arabic Denominal verbs**

Noun	Denominal verb
waraqun ‘tree leaves’	ʔawraqa ‘have tree leaves’
ɵamarun ‘a fruit’	ʔaɵmara ‘bore a fruit’

As-Sayyed observes that the verbs in (11b) express obtaining the noun[27]. *ʔaɵmara* for instance suggests having *ɵamarun*.

[26] This example is taken from Bolozky, “Word Formation Strategies”, p. 7.

[27] as-Sayyed, *al-Mughni fii ʕilm as-Sarf*, p. 131 and 141.

3. Entering upon a period of time

Denominal verbs can also mean getting into a period of time specified by the noun[28]. The well-known Arab scholar *Ibn Yaʕiiʃ* argues that some verbs in Arabic can be formed from the times of the day like *ʔaṣbaħa* 'was in the morning'[29]. Consider the following examples:

(12)	Noun	Denominal verb
	haʃxim 'early in time'	hiʃkim 'be in early time' (Hebrew)
	masaaʔ 'night'	ʔamsa 'be in night' (Arabic)

In conclusion, denominative verbs are lexically formed. Support for the lexical nature of such verbs comes from the lexical properties based on irregular gaps represented by the lack of verb bases. Another argument is the semantic unpredictability of denominal verbs that defined according to the original noun.

3. The Syntactic evidence

In this section, I show how modifiers behave in terms of scope and related reading(s). The use of modifiers presents strong evidence for the lexical nature of Arabic and Hebrew denominative verbs. First I begin with the scope of modifiers and then proceed to discuss the possible readings of the modifiers. These arguments show that a denominal verb is not syntactically indivisible into a verb and a noun.

3.1 Scope of modifiers

Modifiers can test if a verb predicate is formed as one lexical predicate or made up of two verb predicates. Consider the following examples in Arabic:

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[28] as-Sayyed, *al-Mughni fii ʕilm as-Sarf*, p. 136 and 141.

[29] Ibn Yaʕiiʃ, *ʃarħ al-Mufaṣal*, second volume (Beruit: ʕaalam al-Kutub, no date), 103-104.

(13) a. ʔamtara-t as-samaaʔ-u sariiʕan.

had-rain the-sky-nom quickly-acc

The sky had rained quickly.

b. ʔalbana-ti n-naaqat-u ʕaajilan.

become-milked the-she-camel-nom immediately-acc

The she-camel came to have milk immediately.

The adverbs *sariiʕan* and *ʕaajilan* modify the verbs in (13). However other adverbs have different behavior:

(14) a. *ʔalbana-ti n-naaqat-u ṣahii-an.

become-milked the-she-camel-nom deliciously

The she-camel came to have milk deliciously.

b. *ʔazhara-ti l-wuruud-u ħamraaʔ-a.

become-bloomed the-flowers-nom red-acc

The flowers bloomed red.

The adverbs *ʃahiian* and *ħamraaʔa* cannot modify the denominative verbs in (14); hence the sentences are ungrammatical. Why is there a difference between (13) and (14)? The adverbs in (14) cannot access the nominal part (i.e. *labanun* and *zaharun*) of the verbs *ʔalbanat* and *ʔazharat*. The internal structure of the denominative verb is *opaque*. Therefore no syntactic operation like adverb modification can refer to the internal noun as a result of the Lexical Integrity Hypothesis (LIH) of Lapointe.[30] It is interesting to observe that when the noun is used as an independent lexical item, it can have modifiers:

(15) a. an-naaqat-u laban-u-ha ṣahii-un

the-she-camel-nom milk-nom-it delicious-nom

[30] Di Sciullo and Williams, *On the Definition of Word*, p. 49.

The she-camel's milk is delicious.

b. aʃ-ʃajarat-u zuhuur-u-ha ħamraaʔ-u.
the-tree-nom flowers-nom-it red-nom
The tree flowers are red.

The modifiers in (15) access the nominal category and modify the nouns *labanun* and *zuhuurun*. The same reasoning is applicable to the adverbs in (13). Namely the sentences in (13) are good since *sariiʕan* and *ʕaajilan* refer to the verb as a whole and not to the internal noun that is blocked by LIH.

Thus the noun is an internal part of the denominal verb that cannot be accessed by syntactic operations like modification as a direct result of LIH. This gives a conclusive evidence that the denominal verb is lexically formed as one lexical word that is opaque to the rules of syntax.

Turning now to Hebrew, let us examine this example[31]:

(16) John hitʔaziiraʃ maher / miyad.
John became- a citizen quickly / immediately
John became a citizen quickly / immediately.

The adverbs *maher* and *miyad* access the verb and hence they modify it. Similar to Arabic denominative verbs, the adverb in Hebrew cannot access the nominal part of the verb as consequence of LIH. Consider the following example:

(17) *John hitʔaziiraħ beniʔmanut.
John became- a citizen sincerely

[31] The judgments and the interpretation of *all* the Hebrew sentences in this paper in terms of grammaticality as well as the possible readings are all based on the native knowledge of Dr. Shmuel Bolozky, a Professor in the Department of Judiac and Hebrew studies at the University of Massasschusetts-Amherst, as well as some other native speakers. I would like to thank them for their help. I would like to thank Dr. Ibraheem Nasraddiin Dibikee, a professor of Hebrew at the College of Languages and translation at King Saud University in Riyadh, for the time he gave to me to check the pronunciation of all he Hebrew words in this article.

John became a citizen sincerely.

The denominal verb is formed as one lexical complex word. One strong piece of evidence comes from the adverbial modification in syntax. As the examples from Hebrew and Arabic illustrate, the nominal part of the verb cannot be accessed by the adverbs as a result of LIH that blocks the reference of any syntactic operations to the internal structure of a word.

3.2 Adverb Semantics

The use of adverbs can determine if the denominal verb involves one verb predicate in which the noun is a lexical part of the verb. Or the denominative verb involves two predicates in syntax: a verb and a noun. I show in this section that adverbs used with denominal verbs involve one reading which is associated with one lexical word.

There is asymmetry in the behavior of adverbs in denominal verbs and causative verbs. Let us examine first Arabic and consider the adverb semantics in the causative structure:

(18) darras-a Moħammad-un aṯ-ṯaalib-a ðaaħik-an.
caused-teach Mohammad-nom the-student-acc laughingly-acc
Mohammed$_i$ taught the student$_j$ while he$_{i/j}$ was laughing.

(18) is ambiguous because the adverb *ðaaħikan* has two readings associated with the two verb predicates. One reading is generated when the adverb refers to the derived causative verb *darrasa*. The adverb modifies the matrix subject. Thus we get the reading that Mohammad laughingly taught the student. The other reading is established when the adverb refers to the embedded verb root *darasa*. Accordingly, the adverb modifies the object and the reading of the sentence becomes Mohammad taught the student who was laughing. Hoyt confirms the

presence of ambiguity whenever causative verbs are used with adverbs in Arabic spoken by Lebanese Arabs.[32]

(19) John massak xaalid l-ʃanta bi beit l-jiiraan.
John held-cause khaalid the suitcase in the house of neighbors
John made Khaalid hold the suitcase in the neighbors' house.

Hoyt reports that, according to native speakers, there are two possible readings depending on the verb predicate the adverb modifies.[33] To illustrate, the adverb *bi beit ljiiraan* can modify the causative predicate *massak* and the meaning is that in the house of neighbors John made Khalid hold the suitcase. The adverb can also modify the verb root *masaka.* Hence the reading of the sentence becomes Khalid held the suitcase.

The ambiguity of the adverb in the causative structure is a direct result of the presence of two verb predicates in syntax: the causative verb that is marked morphologically by the gemination of the second consonant of verb, the other predicate is the verb root[34]. What about denominal verbs? Do they have ambiguity with adverbs? Let us consider the following examples:

(20) a. ʔalbana-ti n-naaqat-u ʕaajilan.
become-milked the-she-camel-nom immediately-acc
The she-camel came to have milk immediately.

[32] See K. E. Hoyt, "Verb Raising in Lebanese Arabic," in *Student Conference in Linguistics*, MIT Working papers, Cambridge, Massachusetts: MIT University Press, (1989), Hoyt's example (6a) p. 78. A reviewer suggests that the case marking should appear on the end of the words in (19), but case marking is deleted in Arabic dialects. Unlike the case in Standard Arabic, Lebanese Arabic dialect just like any other Arabic dialects is characterized by the absence of case marking. Therefore I leave (19) as Hoyt reported it with no modifications.

[33] Hoyt, "Verb Raising ," p. 78.

[34] Given the ambiguity of the adverb in (19), Hoyt assumes that the causative is derived syntactically by means of merging the verb root with the causative head. This analysis follows Baker's incorporation theory (1988) that analyzes the causative by moving the verb root (e.g. *darasa)* to the higher causative morpheme (e.g. *cause)*. The two verbal roots incorporate together making up the causative verb (e.g. *darrasa).*

b. ʔazhara-ti l-wuruud-u fii l-ħadiiqat-i.
become-bloomed the-flowers-nom in the-garden-gen
The flowers bloomed in the garden.

There is no ambiguity in these sentences. The adverbs only refer to the whole denominative verb structure. Had there been more than one predicate (i.e. the verb and the noun), we would consequently expect to have two readings associated with the two predicates. But this is not the case suggesting that both the verb and the noun share syntactically one lexical verbal predicate.
As for Hebrew, let us consider this example:[35]

(21) Nina garma le Gal letsħoq leitim krovot / be kavana.
Nina caused to Gal to laugh often / on purpose

Arad believes that the adverbs in (21) are ambiguous because they modify the two verb predicates: *garma* and *letsħoq*. Hence the adverbs refer to Nina or Gal.
The ambiguity of adverbs is not restricted to *periphrastic* causatives or causatives that are derived by adding *garma* 'cause' to a verb root. But ambiguity can also be produced in *synthetic* causatives like the following:

(22) Mary limmed 'et Dan babayit.
Mary caused-learn Dan in the house.

The place adverb *babayit* may modify the higher causative verb or the embedded verb root *lamad* 'learn'. Thus the adverb ambiguously refers to either *Mary* or to *Dan*. The presence of the two verb predicates syntactically as can be proven by the adverb ambiguity lends a strong support to Baker's incorporation theory. Thus the causative verb *limmed* merges syntactically the two verb predicates.
Now let us examine the denominative verb used with adverbs:

[35] M. Arad, "VP- Structure and the Syntax-Lexicon Interface," *MIT Occasional Papers in Linguistics* 16, (1998), example 31b, p.160.

(23) John hitʔaziiraħ maher.

John became- a citizen quickly

John became a citizen quickly.

The adverb here modifies the denominal verb and refer to John. The reading is that John's becoming a citizen happened quickly. There is no ambiguity since there is only one verb predicate that is derived as one lexical word.[36]

To conclude this section, the denominal verb based on the use of modifiers cannot access the noun as a result of LIH. Furthermore the verb modifiers prove that denominative verbs involve only one predicate in syntax based on the lack of ambiguity unlike the case in a causative verb. These arguments reinforce the lexical formation of denominal verbs.

4. The Semantic evidence

I argue in this section that the noun of a denominative verb is referentially opaque. As the noun is transformed into a verb, the noun lacks its referential index and hence it loses its nominal flavor. The lack of the referential index of the noun is a strong argument for the lexical formation of the denominal verb. Baker develops a cross-linguistic theoretical analysis for the basic lexical items: verbs, nouns, and adjectives. For nouns, he argues following *Geach* that they are characterized by having a referential index.[37] A referential index means that nouns, unlike other lexical categories, refer to things that are the same. That is,

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[36] The crucial difference between a causative verb like *limmed* and a denominal verb like *hitʔaziiraħ* is the number of predicates in syntax. In other words, the causative involves two predicates as evidenced by the ambiguity of the adverb in example (22) above. On the other hand, the denominal verb has only one lexical verb predicate given the lack of ambiguity in (23) as well as the lexical evidence shown in the second section and the semantic argument in the third section. However both the causative and the denominal verb involve morphologically one complex word.

[37] M. C. Baker, *Lexical Categories: Verbs, Nouns, and Adjectives*, (Cambridge, Massachusetts: MIT University Press, 2003), p. 101 and 102.

only a noun can fill the blank in this syntactic frame that Baker uses "X is the same____asY". For example, *car* is a noun that refers to things that are the same as can be evidenced by using it in the syntactic frame: "This is the same car as Ali bought yesterday". However adjectives or verbs cannot be used in this syntactic frame. For instance, an adjective and a verb are both bad in such frame as the following examples show:[38]

(24) a. * She is the same *intelligent* as he is.
b. *I saw Julia the same *sing* as Mary did.

A noun has a referential index that allows it to refer to things that are the same while verbs and adjectives do not.
Now let us examine if the denominal verb in Arabic has a referential index or not:

(25) mawwal-a at-taajir-u l-maʃruuʕ-a. laqad kana muhim-an.[39]
gave-money the merchant-nom the-project-acc . indeed It was important-acc
The merchant financed the project. It was important.

kana refers to *lmaʃruuʕa* since *lmaʃruuʕa* is a noun and as a result it has a referential index. Hence *kana* (i.e. it) refers to *lmaʃruuʕa*. But there is no way that *it* can refer to *maal* 'money' that is part of the verb. The case is exactly similar in Hebrew:

(26) Dan mimmen et haproyeqt. hu haya ʃel Mary.
Dan financed acc the project. It was of Mary.
Dan financed the project. It was Mary's.

[38] Baker, *Lexical Categories*, examples (15b,c) p. 101.
[39] The purpose of the sentences in (25) is basically to test what the subject of *kana* , i.e. the implicit pronoun *it* , refers to: the noun *lmaʃruuʕa* or to the noun *maal* in the denominal verb. The pronoun refers only to *lmaʃruuʕa* and not to the noun *maal*, hence supporting the referential opacity of the noun in a denominal verb. The test of the referential index of the denominal verb will no longer work had we, as a reviewer recommended, added *lmaʃruuʕa* to the second sentence.

The pronoun *it* can only refer to *haproyeqt*. The pronoun can never refer to the underlying noun of the denominative verb. But why is this case? The noun simply has no referential index. The lack of referential index immediately explains why the pronouns in (25; 26) cannot refer to the internal noun of a denominal verb. The question becomes how does the noun lose its referential index and why?

Baker observes that a word cannot be a noun with a referential index and at the same time a verb. He gives an example of *crystalize*.[40]

(27) a. The solution became a crystal. It was two inches long.
b. The solution crystalized. #It was two inches long.

The noun *crystal* in (27a) has a referential index that can be referred to by *it* while *it* in (27b) cannot refer to the *opaque* noun *crystal* that is a lexical part of the verb *crystalize* as marked by the symbol (#). This symbol suggests ungrammaticality. The noun *crystal* loses its nominal specification as it loses its referential index when it is turned into a verb.

The same analysis is exactly applied to denominal verbs in (25; 26). As the noun loses its nominal flavor it loses its referential index. Hence the noun becomes an indivisible lexical part of the verb predicate adding another proof to the lexical nature of denominative verbs.

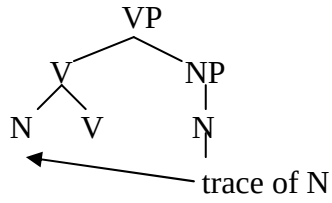
5. Baker's syntactic analysis

Baker argues that morphologically complex words are derived by means of merging two heads in syntax. This syntactic analysis of denominative verbs encounters lexical and syntactic problems that make the syntactic analysis unattainable.

Baker's syntactic analysis[41] of denominative verbs assumes the merger of the noun with a verb head in syntax according to the following structure:

[40] Baker, *Lexical Categories*, example 150 p. 166.

(28)



The denominative verb is syntactically represented as two predicates: a verb head predicate corresponding to *have, become*. The other predicate is the noun root. For example, *ʔaθmara* 'bore a fruit' is syntactically represented as two predicates: the noun *θamarun* is projected under the noun root and the *ʔa-* under the verb node. The noun then moves to merge with the verb morpheme *ʔa-* deriving the denominative verb *ʔaθmara*. Although Baker admits that the denominal word like *crystalize* is a lexicalized verb. He, nonetheless, argues that the verb is derived from a noun syntactically by means of the syntactic movement of the noun.

The syntactic analysis of denominative verbs confronts serious problems. Namely this analysis fails to account for the lexical properties and moreover it violates syntactic principles.

To begin with, the lexical properties of the denominative verb such as the lack of ambiguity and referential index cannot be explained in syntactic framework like that of Baker. For example, the denominative verbs- as we observed in section (3.2)- is unambiguous with adverbs unlike the case in causative verbs. Let us assume for the sake of argument that a denominal verb is projected in syntax as a verb and a noun as the structure in (28). In that case we will not be able to explain the contrast in ambiguity between a denominal verb and a causative verb since both of them are represented in syntax as two predicates. As we saw above in the discussion of example (18), the causative *darrasa* becomes ambiguous with adverbs since such adverbs can refer to the two verb predicates while the denominative verb is non-ambiguous as we saw in the discussion of example

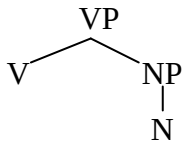
[41] See Baker, *Lexical Categories*. See also Baker, *Incorporation*, p. 166

(20). Therefore the representation of the denominative verb cannot be like the structure in (28). It has to be represented instead as one verb predicate.

Furthermore, the syntactic analysis fails to explain the lack of the referential index of the noun in denominative verbs. Let us remember that the syntactic analysis assumes that both the verb and the noun are projected in syntax. Since the noun is syntactically projected, it should retain its nominal identity together with its referential index. The referential index enables the noun of a denominative verb to introduce a referent into the discourse. However this is not the case at all. The syntactic analysis violates the facts of the examples in (25; 26) where the nouns of denominative verbs in Hebrew and Arabic lose their referential index and thus cannot refer to anything. Because the noun is referentially opaque and loses its nominal identity, the noun cannot be represented in syntax as a noun predicate. Consequently the noun should be represented as a lexical part of the verb predicate.
Hence the lexical representation of the denominative as one verb predicate in syntax not only explains the lack of referential index but also explains its non-ambiguity with modifiers.

Moreover the syntactic analysis of denominative verbs violates syntactic principles. Let us assume that the denominative verb is represented in syntax as the following structure, the same as structure (28) but prior to syntactic movement of N to V:

(29)

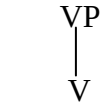


The noun and the verb form a morphologically complex denominative verb. When the verb is formed as one word or *lexcalized* as Baker puts it[42], it moves to

[42] Baker, *Lexical Categories*, p. 166.

another head to check features (i.e. verbal, nominal…) in syntax[43]. However the structure in (29) poses problems to the representation of denominal verbs. To illustrate, the denominative verb cannot be placed under N node because there is a mismatch in category between the verbal category of the denominative verb and the noun category. But if the N node is not possible, the denominative verb may only be placed under the V head and then lowers down to N. But if the verb lowers down, it will leave a trace in its vacant V position. However this trace will not be c-commanded by the verb in the lower position. Thus the trace will not be bound by the verb in violation of Proper Binding Condition (PBC) that requires traces to be bound throughout the derivation. So the lower movement of the verb is not acceptable. But if the denominative verb cannot be placed under the nodes V and N due to syntactic principles, then the denominative cannot be possibly represented as two predicates in syntax. Consequently the denominative has to be represented only as one predicate syntactically as the structure (30) shows:

(30)



denominal verb

6. Conclusions

Denominative verbs in Arabic and Hebrew are lexically formed as one complex word. Evidence for the lexical analysis is based on lexical, semantic, and syntactic arguments. Baker's syntactic analysis of denominative verbs fails to account for the lexical properties of denominative verbs particularly the lack of referential index of the noun and the non-ambiguity of these verbs with adverbs. Furthermore the dual projection of a verb and a noun in syntax as assumed by the syntactic analysis violates syntactic principles. On the other hand, the lexical

[43] See N. Chomsky, *The Minimalist Program* (Cambridge, Massachusetts: MIT University Press, 1995), p. 233.

analysis of denominatives accounts for their lexical, semantic and syntactic characteristics making such analysis empirically superior.