

Lexical Phonological Rules of Annexation in Arabic

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The study has discussed one of the most productive types of Arabic compounds that are composed of the annexed and the annexee's constituents as a continuum ranging from non to a highly productive one. It deals with the morphological annexation as a word-formation process and designs rules for unintentional deriving of those compounds to reach at the multiple rhetorical images drawn by using them. Whether it is real or metaphorical, attributive or subordinate, the annexation is studied as an endocentric and exocentric compounds each of which is of coining noun plus noun or adjective plus noun morphemes. Data gathered are analyzed by means of Lexical Phonology in which the two constituents pass through morphological and phonological processes to coin the compound word. In order to be reliable, annexation study must satisfy the main criteria of compound ship.

Key words: *Productive, Constituents, Metaphorical, Attributive, Morphemes.*

Introduction

Arabic language possesses several rhetorical features and characteristics that are sometimes represented in the meanings and in the statements in another's (Kiparsky,1982). Linguistic metaphor that occupies the front of the four artistic sides of the statement exceeds the limits of the sensitive images to reach at the abstract meanings. Since it is the origin of the rhetoric, linguistic metaphor deals with turning the states of a vocalization not in things and in appearance, but also in the secondary meanings. It changes the vocalization from its original situation to a new one and renews it by the artistic relations as a result the linguistic metaphor is qualified to expand the vocalization of a language by adding new meanings associated with rhetorical origins that keep the first meanings of that vocalization and add the new ones as an expansion by their will. The will is not found without occasion and the innovated meanings are not used without presumption as a result Arabic language as well as the language of Quran appeal to the annex compound as a linguistic metaphor with basic conditions keep it

near to the innate savor of the listener or reader so the planet moon for instance may be a face of a human such as /ful.qa.tu.'qa.ma.rin/ 'lobe of moon'

Fulqat -u qamar -in

Lobe.N.Sing.Fem- NOM moon.N.Sing.Masc-GEN

Lobe moon 'lobe of a moon'

and the Banga tree may be a svelte body of a human as in /yuʃ.nul.'ba:ni/. 'branch of the banga'

ghusn -u al- baan -i

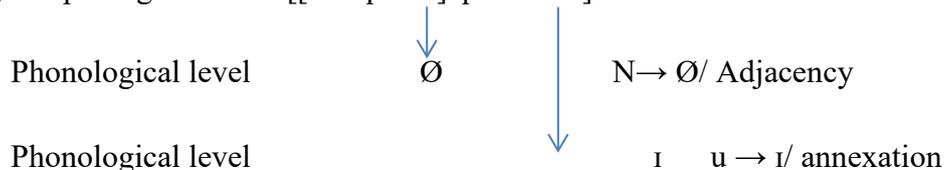
branch. N. Sing. Masc. -NOM the banga. N. Sing. Fem. -GEN.

Branch the banga 'branch of the banga'

These examples can be showed in the following phonological representations in which the first word-base morpheme (the annex or the head) is considered an underlying representation. Combining the head with the annexee, the non-head, passes through morphological and phonological processes to form a morphophonemic unit. This unit is converted to a surface representation by applying morphological and phonological rules. In the second cycle of the following example, there are two levels. The morphological level is the level of adding the dependent to the head on which the lexical phonological rules are applied (Kenstowics,1994:213). Rules of annexation is achieved in case a head , indefinite noun or adjective, is followed by a dependent definite or indefinite noun. In the phonological level that is the result of morphological application, /n/ that represents nunnation is deleted to satisfy adjacency and lenition whereas the ultimate syllable peak /u/ of the non-head is fronted to /i/ because of the genitive case that the annexee acquired after addition as in the following representation.

1st cycle, underlying representation: /'ful.qa.tun/

2nd cycle, morphological level: [['ful.qa.tun]'qa.ma.run] WFR: COMP → N/N-

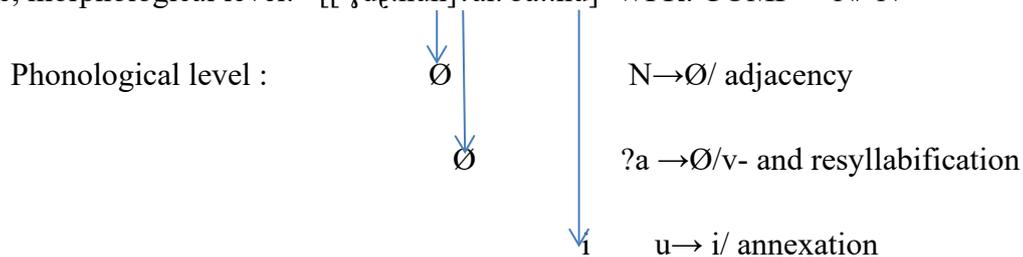


Surface representation: /fil.qa.tu.'qa.ma.rin/

In the following example, deleting the nunnation results in approaching the glottal stop /ʔa/, the onset of the antepenultimate syllable of the annexee to the peak of the ultimate syllable of the annexed /u/ which is banned in Arabic as a result /ʔa/ must be deleted and align /l/ left to be a coda of the previous syllable. (Back, just above half close) /u/ is changed into (front, just above half close) /i/ because of the genitive case that the annexee will have after coining as in the following representation.

1st cycle, underlying representation: 'yuʃ.nun

2nd cycle, morphological level: [['yuʃ.nun]ʔal.'ba:.nu] WFR: COMP→ N/-N



Surface representation: /yuʃ.nul.'ba:.ni/

In accordance with Root and Pattern Morphology (McCarthy,1981:385), the vocalic and consonantal melodies of the annexed constituent can be modified to satisfy six kinds of the annexation. Through observing the data gathered about annexation, the annexed that is the first constituent can be inflected to derive most kinds of annexation and it determines both the grammatical category and the meaning denoted by the compound, in a sense the whole construct will be noun if the annexed is noun and it is adjective if the annex is adjective. The meaning of the head, the color and the state embodied in it determine the meaning of the compound as a whole (Lieber,2010:46) such as /ʔaʃ.fa rul.'waJ.hi/ 'pale'

Asfar -u al-wajh -i
Yellow. Adj. Sing. Masc.- NOM the face. N. Sing. Masc.- GEN
Yellow the face 'the yellow face or pale'

The annexed can be inflected to satisfy most kinds of real and metaphorical annexation such as:

/ka:.tɪ.bu.'qɪʃ.ʃa.tɪn/ 'novel's writer'
Kaatib - u qissat -in
Writer. N. Sing. Masc. - NOM story. N. Sing. Fem. – GEN
Writer story ' story writer'

/kɪ.ta:.ba.tul.'qɪʃ.ʃa.ti/ 'the story writing'
Kitaabat -u al- qissat - i
writing. N. Sing. Fem. – NOM the story. N. Sing. Fem. – GEN
writing the story 'the story writing'

/mak.tu:bul.'hik.ma.ti/ 'of written judgment'.

Maktoub - u al- hikmat -i

Written. N. Sing. Masc. – NOM the judgment. N. Sing. Fem. – GEN

Written the judgment ' the written judgment'

Modifying the construct of annexation by one of the referential elements such as a relative clause or prepositional phrase means modifying the annexed rather than the annexee as a result the annexed is always referential. Since it is measured by weight and assigns the rightmost syllables, annexed is stressless. The flexibility that gives the annexed the capacity to create or produce infinite number of compounds proves its headedness. It can extend the stock of words idiomatically without going back to the rules, Rule bending creativity (Chomsky,1965:6 and Hockett,1958:575). Following this, one can coin an exocentric, the non-compositional compounds whose meaning is not matching the meaning of the two constituents forming it. Most of this headless lexicalized metonyms in Arabic are noun plus noun (Bloomfield,1933:248). When the meaning of the immediate constituents that are coined by following the rules and principles to form actual compounds matches that of the lexicalized word, it is a compositional or an endocentric headed compound (Lieber,2010:48). As it is mentioned above, annexation is divided into real and metaphorical (Abdul Hameed,1980:45). The real or pure addition, adjective or noun, is so- called as the ambiguity that the annexed has is removed when it is added to the annexee. It acquires the definiteness from the defined annexee that is added to. In case it is added to indefinite annexee, the circle size of indefiniteness around the annexed is narrowed or specified. The pure annexed is subdivided into active gerund, inactive descriptive nomen agentis and non-descriptive annexed whereas metaphorical or vocalized annexed is subdivided into active descriptive nomen agentis, nomen patientis and assimilate adjective. By adding it to the annexee, the vocalized annexed acquires lenition by deleting the nunation instead of the definiteness and specification. Substituting the annexed by its derived verb doesn't change the meaning of the whole construct of annexation. Bisetto and Scalise (2005:326) developed extensive taxonomy of compounds. It classified compounds into attributive, coordinative and subordinative. In attributive, the head is non- derived and the non-head acts as modifier of the head. In subordinative, the head is derived from a verb whereas the non-head is an argument of that verb, in a sense it is the template of the verb that forms the patterns of deverbal nouns as in /ki.ta:bah/ 'writing', /ka:trib/ 'writer' and /mak.tu:b/ ' written'. Coordinative is excluded from annexation as it doesn't have two- equal weight constituents or semantic head. Arabic annexation types can be distributed in accordance with the taxonomy diagram of Bisetto and Scalise in the last paper.

Hypothesis

Is coining two lexical entries to form a compound ship random or intentional?

A bulk of Arabic compound words, both endocentric and exocentric, comes from coining two lexical entries on condition that the first is indefinite noun or adjective and the second is either definite or indefinite noun. The researcher proposed that the first constituent the annexed, is originally defined by the prefixal morpheme /ʔal/ 'the' and the ultimate syllable phonetic peak /u/. Before it approaches the annexee, the definite article of the annexed must be deleted and compensated by /n/ , nunnation, as a phonetic coda to its ultimate syllable. The second constituent, the annexee, is bound by choosing one of the two additions, either the prefix /ʔal/ or the suffix /n/. Once the two constituents approach to form a morphophonemic unit, 'n' at the annex boundary will be deleted to satisfy the adjacency (Adheema,1994:311-315). Lexical phonological rules work on that unit convert it into surface or phonetic representation as in the following phonological representation of the compound word /qa.mi:ʃul.fa.'ta:.ti/ 'the girl's shirt'. The annexed is considered the underlied element as it is the head and the annexee is the element added.

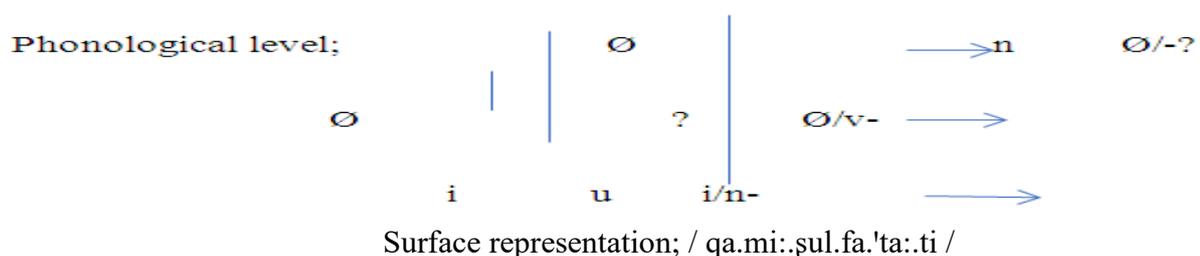
Qamea al- fataat - i

Shirt.N.Sng.Masc-NOM the girl.N.Sng.Fem.-GEN

Girl the shirt 'The girl's shirt'

1st cycle: underlying representation; qa.'mi:ʃun

2nd cycle: morphological level; [[qa.'mi:ʃun]ʔal.fa.'ta:.tu] WFR: COMP→N/N-



The researcher concluded that the two lexical entries forming the Arabic compound word are specified by their final syllable peak which is just above half close. Back just above half close /u/ is the ultimate peak of the first constituent whereas front just above half close /i/ is the ultimate peak of the second as well as the alternative addition of the prefixal morpheme / ʔal/ and the consonantal diacritic coda /n/ to the second constituent as in the following template.

/Cv.Cv.CvvC /that refers to motion or agitation as in / ha.ya.ja:.nu.ʃaʃ.bim/ 'mass agitation'

hayajaan -u shaʃb -in
Agitation. N. Mas. Com.-NOG mass. N. Sing. Com.- GEN
Agitation mass 'mass agitation'

and /CvCC/ as in /ʃil.mu.Zay.din/ 'Zayd's science'
ʃilm -u Zayd -in
science. N. Mas. Com.- NOM Zayd. N. Sing. Masc – GEN
Science Zayd 'Zayd's science'.

Nomen agentis is derived in accordance with the formula /Ca:.CɪC/. It is added to its annexee as if they were present simple verb and object that goes in meaning with the verb such:
as /ka:.tɪ.bu.'qɪʃ.ʃa.tin/ 'a writer of a story'.

Katib -u qɪʃat -in
Writer. N. Sing. Masc- NOM story. N. Sing. Fem-GEN
Writer story 'story writer'

Nomen patientis is derived according to this formula /CaC.Cu:C/ and added in the same way as in:

/ mas.lu:.bu.rɪ.'da:.'m/ ' of being a robe taken off'
Masloob -u rɪdaa? -in
Taken off. N. Sing. Masc-NOM robe. N. Sing. Com-GEN
Taken off a robe 'of being a robe taken off '.

Assimilate adjective is derived in accordance with one of these formulae /Ca.CaC/, /Ca.Ci:C/ to be added to its annexee as in /əa.qi:.'lud.da.mi/ 'distempered'.

Inactive descriptive is derived from its verb according to the following formula /Ca.CaC/→ /Ca:.CɪC/ such as /ka.tab/ 'wrote'→ /ka:.tɪb/ 'writer'. It is added to its annexee as if they were past simple verb and object that doesn't go in meaning with the verb as in /ka:.tɪ.bu.maħ.'ka.ma.tɪn/ 'writer of the court'

Kaatib -u maħkamat -in
Writer. N. Sing. Masc- NOM court. N. Sing. Fem – GEN
Writer a court 'writer of a court'.

Attributive Annexed

Annexed that is attributive identifies the type, the ownership, the simile, derivative and non-derivative adverb of place and time of the annexee instead of describing it such as:

/qa.mi:.su.ħa.'ri:.rin/ 'a shirt from silk'
qameeʃ -u ħareer -in
Shirt. N. Sing. Com – NOM silk. N. Mas. Com – GEN
Shirt silk 'silk shirt',

/qa.mi:su.'zay.din/ 'Zayd's shirt'

gameeş -u Zayd -in
Shirt. N. Sing. Com – NOM Zayd.N. Sing. Masc- GEN
Shirt Zayd 'Zayd's shirt',

/lu?.lu.ʔud.'dam.ʕi/ 'tears as pearls'

lu?lu? -u al-damʕ -i
Pearls. N. Plu. Fem-NOM the tears. N. Plu. Fem-GEN
Pearls tears 'tears as pearls',

/sa.fi:.na.tuʂ.ʂaħ.ra:.'i/ 'a ship of the desert - the camel'

Safeenat -u al-ʂaħraa? -i
ship. N. Sing. Fem-NOM the desert. N. Sing. Fem.- GEN
ship the desert 'a ship of the desert = camel',

/mak.rul.'lay.li/ 'cunning of the night'

Makkr -u al-layl -i
Cunning. N. Mas. Com-NOM the night. N. Mas. Com-GEN
Cunning the night 'cunning of the night'

and /mu.qa:.mu.'rab.bi.hi/ 'standing of his Lord'

Muqaam -u Rab -i -hi
Standing. N. Sing. Masc-NOM Lord. N. Sing. Masc. – GEN-his.3rd.pr.sing. Masc. poss. Pro.
Standing Lord his 'standing of His Lord'.

Compositionality and Preferentiality

Though both are productive derivational processes, Arabic compound word is different from the word derived by coining a base and affixation. These compounds are composed by coining free N+N or Adj + N word- base morphemes and the meaning of the compound word is determined by the two constituents forming it. The constituent that plays a vital role in making these compounds is the head, the first one (Bloomfield,1933:195). It is the constituent with which the whole construct shares its syntactic role as it can be nominative.

/Ja:.'a. ka:.ti.bul.maħ.ka.ma.ti/ 'the writer of the court came'

Jaa? -a Kaatib -u al-maħkamat -i
Came. V. Past-Masc. writer. N. Sing. Masc. -NOM the court. N. Sing. Fem-GEN
Came a writer the court 'A writer of the court came'

,accusative /qa:.bal.tu.ka:.ti.bal.maħ.ka.ma.ti/ 'I met the writre of the court'

Qaabal -tu Kaatib -a al-maħkamat -i
Met. V. Past.-I. sub. writer. N. Sing. Masc-ACCU the court. N. Sing. Fem- GEN
Met I a writer the court 'I met a writer of the court'

or genitive when it follows a preposition such as /sal.lam.tu.ʕa.la:ka:.ti.bil.maħ.ka.ma.ti/

'I passed by the write of the court'

Salam -tu ṣalaa Kaatib -i al-maḥkamat -i
greeted. V. Past- I. Sub. upon. Prep. Writer. N. Sing. Masc-GEN the court. N. Sing. Masc-GEN

Greeted I upon a writer the court 'I greeted a writer of the court'

While the dependent, non-head or annexee, has no syntactic role in the construct (Zwicky,1993:297). If the compound has the same function of its head, it is endocentric (Bloomfield,1933:235) in a sense the meaning of the construct /qa.mi:ṣu.ḥa.ri:rin/ 'silk shirt' is a subtype of the meaning of the head /qa.mi:ṣu/ 'shirt' while the dependent /ḥa.ri:rin/ 'silk' plays a contributory role in the semantics (Zwicky, 1993:296). Since it bears the inflection, the first constituent of Arabic annexation, noun or adjective, is considered the head (ibid,1985:2) so all endocentric, a compositional in meaning (Neef,2009:394), Arabic compound words are left- headed. The first constituent of annexation, the head or annex can be modified by relative clause or prepositional phrase as a consequence it is always referential (Altakhaineh,2016:105). In case neither the annexed nor the annexee impose its category on the whole construction, Arabic annexation is categorically exocentric (Ralli and Andreo,2010:69) as:

in /Ja.li:suz.za.ma:ni/ 'a friend of the time'

Jalees -u al-zamaan -i
a friend. N. Sing. Masc-NOM the time. N. Sing. Com-GEN
a friend the time 'a friend of the time'

as neither /Ja.li:s/ 'a friend' nor /ʔaz.za.ma:n/ 'the time' refers to 'the book', the vertical meaning of the compound word.

Stress

Stress of Arabic language is sensitive to the internal structure of the syllable or its weight (Gorden, 2006:19). Arabic is CV in most initial and medial syllables, but most of ultimate syllables are super heavy CVVC or CVCC as a consequence stress is sensitive to both onset and rime weight that is scalar in hierarchical manner. It falls on the rightmost heaviest syllable within a three- syllable window at right edge of the word (Everett, 1998:108). Ultimate syllable of Arabic word is stressed if it is super heavy (cvvc or cvcc). If not, penultimate is stressed when it is heavy. In case neither ultimate nor penultimate syllables satisfy the parameter of Arabic word stress, antepenultimate must be stressed whatever it might be. As far as compounding is concerned, the two constituents of Arabic compound, two word-base morphemes, are coined to be a fully- formed word as a result assigning stress follows the same principles of word stress mentioned above, in a sense assigning stress is on the right edge of the annexee or non-head as in /ki.ta:bu.ʕa.'lɪy.yɪn/ 'Ali's book' kitaab-u Ali-in. In nominal sentence, the two constituents forming its subject and predicate are two

separate words as a result stress is assigned on each word as in /ʔal.kɪ.'ta:.bu| mu.'fi:.dun/ 'the book is useful' al-kitaab-u mufeed-un.

Limitations on Productivity of Annexation

-The template and the formulae denote coining noun plus noun or adjective plus noun does not mean producing compound words that are not existed. Some are semantically, morphologically and phonologically possible (Plag,2003:44), but they are not actual in use as in coining annexation from synonyms such as ^{*}/lay.əu.ʔa.sa.dɪn/ 'lion lion' or ^{*}/qam.ħu.bir.rɪn/ 'wheat wheat'

-Elements of the construct don't reveal a contrastive order or alternating the internal elements. It must satisfy internal stability (Bauer,1998:82), the head must be identified as the domain for productive annexation so adjective plus noun compound can't be alternated to be noun plus adjective as adjective is the head added whereas noun is the annexee or dependent as in ^{*}/waj.hu.ħa.sa.nɪn/. ^{*}'face beautiful'

Wajh -u ħasan -in
Face. N. Sing. Com-NOM beautiful. Adj. Sing. Masc-GEN

^{*}Face Beautiful

- Phonology adds some restrictions on producing annexation. In case it is singular, the ultimate syllable of the annexed must be shortened by deleting the coda consonant /n/ to satisfy lenition whereas in the dual and sound masculine plural, the ultimate superheavy syllable of the annexed is reduced into a heavy one by deleting the same /n/ as a result stress is shifted to one of the annexee's syllables depending on weight and gain lenition in pronouncing them.

- The frequency of established word and its synonymic lexeme in the mental lexicon represent a force of blocking to it and to a function of productivity for the actual words (Rainer,1988:163) such as ^{*}/ra.ju.lu.ʔa.sa.dɪn/ 'lion man' is equal to or synonym of /ʃu.ja:ʃ/ 'brave'.

- Any external item such as /min/, /li/, /ka/, /fi:/, /ʃinda/ must not be freely inserted within the construct as these identities that are estimated implicitly impose etymological restrictions or limitations on production of the annexation in case they are inserted (Schmid,2011: 116) so the fully formed word must satisfy uninterruptedness (Bauer,1998:82), otherwise the compound will be a syntactic structure as in:

/mu.qa:.mu.'rab.bi.hi/'His Lord's position→*mu.qa:.mun.**ʃin.da**.rab.bi.hi/ 'a position at His Lord's' and /lu.jay.nul.'ma:.'i/ 'silverness of water' →*ma:.'un.**kal**.lu.jay.ni/ 'water as silver' as a result the construct is move as a unit in the context not as separate elements to satisfy positional mobility (ibid,1998:82).

-What is general that represents the annexed or head is always added to what is private that represents the annexee, non-head, so /ra.ma.da:n/ is a private kind of the months and /ʔal.jum.ʃah/ is a private kind of the days as a result annexation is blocked if the coinage is *ra.ma.ða:.nu.Sah.rin/*Ramadañ of month'

ramadañan -u shahr -in
ramadañan. N. Sing. Masc- NOM month. N. Sing. Com- GEN
Ramadañan month 'Ramadañan of month'
instead of /ʃah.ru.ra.ma.ða:.nin/'the month of Ramadañ'
shahr -u Ramadhaan -in
month. N. Sing. Com- NOM Ramadhaan. N. Sing. Com-GEN
month Ramadhaan ' the month of Ramadhaan'
and*Jum.ʃa.tul. yaw.mi/*Friday of the day'
Jumʃat -u al- yawm -i
Friday. N. Sing. Com-NOM the day. N. Sing. Com-GEN
Friday the day 'Friday of the day'
Instead of/yaw.muJ.Jum.ʃa.ti/ 'the day of Friday'.
Yawm -u al- jumʃat -i
Day. N. Sing. Com-NOM the Friday. N. Sing. Com-GEN
Day the Friday 'the day of Friday'.

As it is mentioned that Arabic is Cv, the prefixal morpheme 'al' must be preceded by the glottal stop 'ʔ' to satisfy principles of Arabic syllable. By approaching the word-base morpheme containing the prefixal morpheme 'ʔal' to the head, 'ʔa' is deleted in the context of the preceding vowel 'u' and /l/ is aligned left to be a coda of the previous syllable 'mul'. Due to its adjacency to the onset of the following syllable (Siegel,1974:111), /l/ is assimilated into/J/ in the context of the following /J/ by which the geminated consonants/ JJ/ violates obligatory contour principle OCP (McCarthy,1986:280) as the two adjacent similar consonants are separated into two different syllables

Yaw.mu ʔal.Jum.ʃa.ti
 Ø
Yaw.mul Jum.ʃa.ti
 |
Yaw.muJ Jum.ʃa.ti



/Yaw.muJ.Jum.ᶒa.ti/

Conclusion

Phonological processes sensitive to morpheme boundary specially Arabic compound words are called morphophonology or lexical phonology. Since they are two lexical entries, Arabic annexation is of two word- base morphemes. They are always cyclic in which the first cycle represents the underlying representation, the annex, whereas the second is of two levels. The morphological level by which the annexee is added to the annex to form a morphophonemic unit. The morphological level represents an environment for the phonological change or phonological level. Rules work on the two levels, lexical phonological rules, convert the morphophonemic unit into surface representation or phonetic representation that is actually heard. Satisfying reliability, Annexation based on the main criteria such as adjacency, compositionality, stress and referentiality .Compounding is blocked due to certain phonological, morphological and semantic reasons.



REFERENCES

- Abdul, H. M. M. (1980). *Sharh Ibn Aqeel, investigating, daril eloum alhadeetha*. Beirut.
- Adheema, M.A. (1994). *Investigation of almuqtadhab by Almubarrid*, Cairo.
- Altakaineh, (2016a). *Compounding in modern standard Arabic*. Jordanian Arabic and English, Newcastle University, UK.
- Bauer, L. (2001). *Morphological productivity*. Cambridge University Press.
- Bauer, L. (1998). *When is a sequence of two nouns a compound in English*. Cambridge University Press.
- Bisetto and Scalise, (2005). *The classification of compounds*. Cambridge University Press.
- Bloomfield, L. (1933). *Language*. New York: Henry Holt and Co.
- Chomsky, (1965). *Aspects of the theory of syntax*. The MIT Press.
- Everett, (1998). *The acoustic correlation of stress in Piraha*. *Journal of Amazonian language*, 1(2):104-162.
- Gordon, (2006). *Syllable weight: Phonetics, phonology, typology*. New York: Routledge.
- Hockett, (1958). *A course in modern linguistics*. Worldcat. Org.
- Kenstowicz, M. (1994). *Phonology in generative grammar*. Blackwell.
- Kiparsky, P. (1982). *Lexical phonology and morphology*. In Yang 1. –s. (ed). *Linguistic morning Calm*. Seoul, Hanshin: 3-91.
- Lieber, R. (2010). *Introducing morphology*. Cambridge University Press.
- McCarthy, J.J. (1981). *A prosodic theory of non- concatenative morphology*, *linguistic inquiry* 12, 373-418.
- McCarthy, J.J. (1986). *OCP Effect: Geminataion and anti- geminataion*. The MIT Press.
- Neef, (2009). *IE, Germanic: Germany*. *The oxford handbook of compounding*. Oxford: OxfordUniversity Press 386-399
- Plag, (2003). *Word-formation in English*. Cambridge University Press.

Rainer, F. (1988). Toward the theory of blocking: The case study of Italian and German quality nouns

Ralli and Andreo, (2010). Revisiting exocentricity in compounding, Tohn Benjamins Publishing Company.

Schmid, (2011). English morphology and word-formation. An introduction.

Siegel, P. (1974). Topics in English Morphology. New York, Garland Press.

Zwicky, (1985). Heads. Cambridge University Press.

Zwicky, (1993). Heads, bases and functions. Cambridge University Press.

The Table (3) Arabic Phonemes

Manner of Articulation	Place of articulation										
	Bi-labial	Labio-dental	Dental	Alveo-dental	alveolar	Palate-alveolar	Palatal	velar	Uvular	Pharyngeal	glottal
Stop normal emphatic	b			t d t̤ d̤ʕ				k	q		ʔ
Nasal	m				n						
Fricative norm Emphatic		f	θ ʕ θ̤ ʕ̤		s z ʕ				x ʁ	ħ ʕ	h
Affricate						j					
Lateral					l						
Approximant	w				r		y				

Chart (1) Adjustment in regions of Arabic vowels

