LEVEL-ORDERED MORPHOLOGY IN MODERN STANDARD ARABIC (MSA)

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ABSTRACT

This research paper is a description of a morphological process of language referred to as level-ordered morphology and its role in the formation of words in Modern Standard Arabic within the framework of the Lexical Morphology theory. The description is aimed at examining the shape taken by a lexical category when it goes through the morphological processes of affixation, and which culminate in the formation of a word. Further, it provides an explanation as to the extent to which the morphological concept of strata is applicable to Modern Standard Arabic, thereby validating a key component of the lexical morphology theory in as far as the morphology of the modern standard variety of Arabic is concerned. The paper concludes that indeed the lexicon of Modern Standard Arabic is hierarchically sructured where both derivational and inflectional affixes are displayable on a series of strata which are interlinked. The results of this study confirm that the arguments put forth by the Lexical Morphology theory are valid and are applicable to Modern Standard Arabic.

Key words: Lexicon, stratum, derivation, inflection, affix, affixation.

1.0 Introduction

Lexical morphology theorists argue that the morphological structure of a word comprises two main morphological levels; namely: Level -One and Level Two Morphology. The two levels are further sub-categorized into Level-One Nominal Morphology, Level-One Verbal Morphology, Level-Two Nominal Morphology and Level-Two Verbal Morphology. This classification is supported by, among others, Kiparsky (1982), Mohanan (1982), Katamba (1989) and Watson (2002). On the one hand, Level-One morphology fundamentally deals with the addition of derivational affixes to a word stem to derive words other than those from which the derivation is done. On the other hand, Level-Two morphology deals with the inflection of words mostly by adding inflectional morphemes to the root and stem of the word. Therefore, hypothetically, level-one morphology is usually equated with derivational morphology whereas level-two corresponds to inflectional morphology.

The proponents of the Lexical Morphology theory also propose a morphological concept referred to as strata, which refers to a series of affixation morphemes which come packaged together in the word formation process. The morphemes are usually linearly arranged so that both derivational and inflectional word formation processes occur in a series of strata or levels which are linked together.

This concept provides that words are made up of the root, base and affixes, and that the affixes are organized into strata, such that certain affixes are added at level one and others at level two. Level 1 affixes are closer to the root than Level 2 affixes, in what is known as the ordering of affixes. The import of this is that morphological rules apply in the lexicon in such a way that rules apply first to the root of the word, then outward to the subsequent layers of affixes. This results in a lexicon which is considered as having an internal structure and not just a list of words. Katamba (1989:258) likens this structure to an onion 'with the root of the word as the core, and Level 1 as the inner layer, Level 2 as the outer layer and post-lexical phonology as the skin on the outside'. This ordering of affixes can be illustrated in the following sketch:

Prefixes   [root/base]   Suffixes
[Level 1 affixes]   **[Root]**   [Level 1 affixes]
[Level 2 affixes] [Level 1 affixes] **[Root]**   [Level 1 affixes] [Level 2 affixes]

This study is therefore, an elaborate discussion of morphological processes which fall under both Level-One and Level-Two morphology of Modern Standard Arabic (MSA). It endeavours to identify word formation affixes in MSA and classify them into the various strata identified in the lexical morphology theory with the overall objective being to determine the extent to which the concept of strata can be applied to the MSA morphology.

2.0   Theoretical Framework

This study is conducted within the framework of the Lexical Morphology theory. Although the theory is usually explained together with the phonological aspect of language under the framework of the Lexical Phonology theory, this discussion will be limited to only the morphological component of the MSA words. Proponents of the theory argue that morphological processes of language involve the addition of affixes at different strata/levels which result in the formation of different word categories and that the different levels at which affixation is done are associated with a set of morphological rules. Further, alongside the morphological rules are phonological rules which show how the resultant structure built by the morphology should be articulated. In this regard, Kiparsky (1982:131) argues thus:

> 'the basic insight of level-ordered morphology is that the derivational and inflectional processes of a language can be organized in a series of levels. Each level is associated with a set of phonological rules for which it defines the domain of application. The ordering of levels moreover defines the possible ordering of morphological proceses in word formation'.

It is worth observing that although the proponents of the lexical morphology theory are generally agreed that the lexicon is hierarchically structured, they are, nonetheless, not in agreement on the number of levels or strata involved. Mohanan, (1982:8) for instance, advocates for a 4-level hierarchical structure. According to him, derivations take place at both Stratum 1 and Stratum 2, while Stratum 3 and 4 involve the processes of compounding and inflection respectively.

On his part, Kiparsky (1982:133) suggests 3 strata in which Stratum 1 constitutes derivation as well as primary inflection, Stratum 2 involves compounding while Stratum 3 constitutes secondary inflection. Katamba (1989:259) argues in favour of two strata, namely Stratum 1, which involves derivations and Stratum 2 which involves inflections. He goes on to observe that a suffix at a given level can be followed by other suffixes at the same level where all the suffixes in question are at Level 1 or at Level 2. This yields forms such as, publ+ic+ity, pur+if+ic+at+ion, electr+if+ic+at+ion for Level 1 and forms such as, re+re+make, care+ful+ness, lead+er+less for Level 2. (1989:269). He also argues that it is for the same reason that we have morphological forms such as grammar, grammar-**ian,** grammar-**ian-ism** and not *****grammar-**ism-ian** as well as Shakespeare, Shakespear-

ian, Shakespear-**ian-ism** and not ***Shakespear-ism-ian** where ***grammar-ism-ian** and ***Shakespear-ism-ian** are ill-formed categories.

As stated earlier, Mohanan (1982:8) proposes that the English lexicon be stratified into four strata or levels. Stratum 1 involves Primary (irregular) derivation which may be exemplified by the derivation of a noun from an adjective through the affixation of the derivational morpheme *-ity* as seen in the example below:

(1)   Adj + sfx   →   N
          civil + ity   →   civility

Further, Stratum 2 involves Secondary (regular) derivation. For instance, a noun is derived from an adjective by adding the suffix *-ness* to the base as shown below.

(2)   Adj + sfx   →   N
          good + ness   →   goodness

Stratum 3 involves Compounding where a compound word is derived through combining two word categories, N, V, Adj, etcetera. An example is given below:

(3)   N   +   N   →   N
          power+house   →   powerhouse

Stratum 4 involves Secondary (regular) inflection such as the inflection of nouns for plural by affixing the plural inflectional suffix *-s* as shown in the example below:

(4)   N + sfx   →   N
          boy + s   →   boys

On his part, Kiparsky (1982:133) suggests that the lexicon should be stratified into three strata; namely: strata 1, 2 and 3.   Stratum 1 involves primary (irregular) inflection which may be exemplified in English through processes such as umlaut, ablaut as well as past tense formation as seen in the examples below:

(5)   Umlaut in English   N → N (pluralization) for example, tooth → teeth
          Ablaut   V → V (past tense)   such as sing → sang/sung
          past tense   V → V (past tense)   for example, sleep→ slept

In addition, Stratum 1 also involves primary (irregular) derivation as in the case of deriving words by adding the following primary affixes: *-ous, -al, and -th*, as illustrated below:

(6)   V   +   sfx   →   N
         withdraw + al   →   withdrawal

Stratum 2 involves secondary (regular) derivation, where secondary affixes are added to words to form other word categories. The secondary affixes include: *-ness, -un, -er* which may be added to other word categories as shown below.

(7)   Adj + sfx   →   N   Verb + sfx   →   N
          good + ness   →   goodness   wait + er   → waiter

It also involves compounding, which is done through a combination of lexical categories (N, Adj, V, P). The resultant compound word is N, V or Adj as demonstrated below:

(8)   Adj + N   →   N   N   + V   →   V
        green + N → greenhouse   spoon + feed   →   spoonfeed

Stratum 3 , according to Kiparsky (1982:133) involves secondary (regular) inflection where words are inflected for plural by affixing the plural morpheme *–s*. Also, words are inflected for tense by adding the past tense suffix *-ed* to the root of the word. For example:

(9)   N+sfx   →   N
          dog+s →   dogs

The theory also makes reference to what is known as the Bracket Erasure Convention (BEC) which is used to explain the practise of erasing internal brackets that are introduced during the process of

word formation. Durand (1990:175) defines it as one which 'erases the internal brackets at the end of each level'. On her part, Watson (2002:200), quoting Kiparsky (1982:140), explains that the Bracket Erasure Convention is 'one in which internal brackets are erased at the end of a level'.

Many of the arguments about strata make reference to both morphological and phonological rules. However, our discussion focuses on the morphological rules only.

2.0   Research Methodology
The method used to collect data for this study involved random collection of MSA words and subjecting them to a morphological analysis to determine the extent to which the lexical morphology theory is applicable to the morphology of MSA. In the course of the analysis, focus was put mainly on areas that highlighted the pertinent morphological processes in the formation of MSA words. We, to a large extent, relied on our intuition as competent speakers of MSA to analyze and verify the data collected. The analysis was based on the arguments advanced by proponents of the lexical morphology theory.

3.0   Discussion
With the benefit of the background information provided above on the structure of the lexicon in English, let us now examine how affixes are ordered in the MSA lexicon.

3.1   The Ordering of Affixes in the MSA Lexicon
Based on the above discussion, we suggest that the MSA lexicon be classified into Stratum 1 and Stratum 2, where Stratum 1 comprises both primary derivation and inflection affixes while stratum 2 consists of affixes of secondary derivation and inflection. The affixes constitute prefixes, infixes and suffixes. As stated earlier, stratum 1 affixes are added within the word stem while those of stratum 2 are added outside the stem of the word. Primary derivation in MSA involves the derivation of the following word types: infinitive verbal nouns, the [faʕlaːn] adjective, nouns from adverbs, nouns of instrument, nouns of place, active participles, passive participles as well as deverbative verbal nouns. Primary inflection involves the formation of: broken plurals, dimunitives, elatives, tri-consonantal verbs (classes 2-10) and passive verbs. Stratum 2 involves both secondary derivation and secondary inflection. Secondary derivation includes deriving adjectives from nouns as well as deriving adjectives from adverbs, while Secondary inflection involves inflection for gender, number, tense, case, definiteness and possession.

For purposes of this study, we focus on the process of ordering of affixes in a single word. In other words, a single word may comprise a series of derivational followed by inflectional affixes which apply at both level-one and level-two of the lexicon. The particular morphological processes to be analyzed are: derivation of nouns of place, nouns of instrument, verbal nouns, participles, adjectives and adverbs. The derivation is then immediately followed by inflection.

3.1.1 Derivation of Nouns of Place and Subsequent Inflections (Verb → Noun)
This process involves the addition of affixes to a verb base in a linear manner leading to the formation of a new word category in the form of nouns of place, as shown in the example below:

(10)   der.pfx   verb base infl.sfx   infl.sfx infl.sfx →   Derived word

　　　　[[[[ma+ [katab]]   +aːt]   +u]   +haː] →   [maktabaːtuhaː]
　　　　　　　　　　'he wrote'   'her/its libraries'

The morphological processes above may be captured in the data below:

Level Ordering of Affixes in the Derivation of Nouns of Place in MSA and Subsequent Inflections

Prefix Level 1 aff]	[Verb Base]	[Level 1 aff]	Suffixes [Level 2 aff]	[Level 2 aff]	Derived Noun	Gloss
	[katab]	-	-	-	-	'he wrote'
[ma+	[katab]]	-	-	-	[maktab]	'office'
[[ma+	[katab]]	-	+ijj]	-	[maktabijj]	'of office'sing.masc.
[[[ma+	[katab]]	-	+ijj]	+at]	[maktabijjat]	'of office' sing. fem.
[[ma+	[katab]]	-	+at]	-	[maktabat]	'library'
[[[ma+	[katab]]	-	+at]	+aan]	[maktabataːn]	'libraries' dual.
[[ma+	[katab]]	-	+aːt]	-	[maktabaːt]	'libraries' plural.
[[[ma+	[katab]]	-	+aːt]	+ iː]	[maktabaːtiː]	'my libraries'

From the data above, we notice that the prefix *ma-* and suffix *–ijj* are derivational morphemes, while the suffixes *–at, -aːn, -aːt, -iːt* and *-aːt* are all inflectional morphemes. The derivational morphemes are affixed first to the verb base followed by inflectional morphemes as illustrated by the brackets. The brackets then get erased at every level in line with the Bracket Erasure Convention. (BEC). Below is a simplified form of these processes:

(11)   [katab]   'he wrote'
        [ma+[katab]] →   [maktab]   'office'
        [[maktab]+ijj] →   [maktabijj]   'of office'
        [[maktab]+at] →   [maktabat]   'library'

3.1.2 Derivation of Nouns of Instrument and Subsequent Inflections (Verb → Noun)

This is a process of affixation where affixes are ordered in a linear and hierarchical manner leading to the formation of a noun of instrument as shown below.

(12)   der.pfx   verb base   infl.aff   infl.sfx   infl.sfx →   Derived word

        [[[[mi+   [fataħ]]   +N]   +u]   +haː] →   [mafaːtiːħuhaː]
            'he opened'   'her keys'

These processes are captured in the data below:

Level Ordering of Affixes in the Derivation of Nouns of Instrument in MSA and Subsequent Inflections

Prefix Level 1 Aff]	[Verb Base]	[Level 1 aff]	Infixes and Suffixes [Level 2 aff]	[Level 2 aff]	Derived Noun	Gloss
-	[fataħ]	-	-	-	-	'he opened'
[mi+	[fataħ]]	-	+N]	-	[miftaːħ]	'key'
[[mi+	[fataħ]]	-	+N]	+u]	[miftaːħu]	'key' (ind.)
[[mi+	[fataħ]]	-	+N]	+aːn]	[miftaːħaːn]	'keys' dual.
[[mi+	[fataħ]]	-	+N]	-	[mafaːtiːħ]	'keys' pl.
[[[mi+	[fataħ]]	-	+N]	+u]	[mafaːtiːħu]	'keys' pl. (ind.)
[[[mi+	[fataħ]]	-	+N]	+hum]	[mafaːtiːħuhum]	'their keys' pl.masc.

3.1.3 Derivation of Deverbative Verbal Nouns and Subsequent Inflections (Verb → Noun)

In this process, prefixes, infixes and suffixes are added to a verb base in an ordered and hierarchical manner depending on the class in which the verb belongs as shown below:

(13)   verb base   der.aff   infl.sfx   infl.sfx   →   Derived Noun   Gloss

(i)   [[[[darras]   +N]   +u]   +haː]   →   [tadriːsuhaː]   'her teaching'

(ii)   [[[[ʔaslam]   +N]   +u]   +hum] →   [ʔislaːmuhum]   'their Islam' pl.masc.

These processes are captured in the data below:

Level Ordering of Affixes in the Derivation of Deverbative Verbal Nouns in MSA and Subsequent Inflections

Verb Class	Prefix Level 1 aff	Verb Base	Infixes and Suffixes			Derived Verbal Noun	Gloss
			Level 1 aff	Level 2 aff	Level 2 aff		
2	-	**[darras]**	-	-	-	-	'he taught'
	ta+	[[darras]	+N]	-	-	[tadriːs]	'teaching'
	ta+	[[[darras]	+N]	+u]	-	[tadriːsu]	'teaching' ind.
	ta+	[[[[darras]	+N]	+u]	+haː]	[tadriːsuhaː]	'her teaching'
3	-	[xaːtˤab]	-	-	-	-	'he addressed
	-	[[xaːtˤab]	+N]	-	-	[xitˤaːb]	'speech'
	-	[[[xaːtˤab]	+N]	+u]	-	[xitˤaːbu]	'speech' ind.
	-	[[[[xaːtˤab]	+N]	+u]	+hu	[xitˤaːbuhu]	'his speech'
4	-	**[ʔaslam]**	-	-	-	-	'he became Muslim'
		[[ʔaslam]	+N]	-	-	[ʔislaːm]	'Islam'
	-	[[[ʔaslam]	+N]	+ijj]	-	[ʔislaːmijj]	'Islamic/ Islamist masc.
	-	[[[[ʔaslam]	+N]	+ijj]	+at]	[ʔislaːmijjat]	'Islamic/ Islamist.fem.
	-	[[[[ʔaslam]	+N]	+ijj]	+uːna]	[ʔislaːmijjunːa]	'Islamists' pl.masc.
	-	[[[[ʔaslam]	+N]	+ijj]	+aːt]	[ʔislaːmijjaːt]	'Islamists'pl.fem.
5	-	**[taqaddam]**	-	-	-	-	'he/it progressed'
		[[taqaddam]	+N]	-	-	[taqaddum]	'progress'
	-	[[[taqaddam]	+N]	+ijj]	-	[taqaddumijj]	'progressive'
6		**[taqaːʕad]**	-	-	-	-	'he retired'
	-	[[taqaːʕad]	+N]	-	-	[taqaːʕud]	'retirement'
		[[taqaːʕad]	+N]	+jj]	-	[taqaːʕudijj]	'pensionary'
7		**[ʔinʕazal]**	-	-	-	-	'he isolated himself'
	-	[[ʔinʕazal]	+N]	-	-	[ʔinʕizaːl]	'isolation'
	-	[[[ʔinʕazal]	+N]	+jj]	-	[ʔinʕizaːlijj]	'isolationist'

	-	[[[[ʔinʕazal]	+N]	+jj]	+u]	[ʔinʕizaːlijju]	sing. masc. 'isolationist'
	-	[[[[ʔinʕazal]	+N]	+jj]	+uːn]	[ʔinʕizaːlijjuːn]	sing. masc. ind. 'isolationists' sing. masc.
8	-	**[ʔixtabar]**	-	-	-	-	'he/it tested'
	-	[[ʔixtabar]	+N]	-	-	[ʔixtibaːr]	'experiment'
	-	[[[ʔixtabar]	+N]	+jj]	-	[ʔixtibaːrijj]	'empirical' sing.masc.
	-	[[[[ʔixtabar]	+N]	+jj]	+at]	[ʔixtibaːrijjat]	'empirical' sing. fem.
9	-	**[ʔiħmarr]**	-	-	-	-	'it became red'
	-	[[ʔiħmarr]	+N]	-	-	[ʔiħmiraːr]	'redness'
	-	[[[ʔiħmarr]	+N]	+u]	-	[ʔiħmiraːru]	'redness' ind.
	-	[[[[ʔiħmarr]	+N]	+u]	+haː]	[ʔiħmiraːruhaː]	'its redness' sing. fem.
10	-	**[ʔistaθmar]**	-	-	-	-	'he invested'
	-	[[ʔistaθmar]	+N]	-	-	[ʔistiθmaːr]	'investment'
	-	[[[ʔistaθmar]	+N]	+aːt]	-	[ʔistiθmaːraːt]	'investments'
	-	[[[[ʔistaθmar]	+N]	+aːt]	+u]	[ʔistiθmaːraːtu]	'investments' ind.
	-	[[[[ʔistaθmar]	+N]	+aːtu]	+h]	[ʔistiθmaːraːtuh]	'his investments'

3.1.4 Derivation of Active Participles of Class 1 Tri-consonantal Verb Stems and Subsequent Inflections (Verb → Active Participle)

This involves processes of affixation where prefixes and suffixes are attached to the verb base as shown below:

(14)   verb base   der.affx   infl.sfx   infl.sfx   →   Derived word

       [[[[daras]   +AP]   +uːna]   +hu]   →   [daːrisuːnahu]

         'he studied'   'his learners' pl.masc.

The hierarchical nature of these morphological processes can be captured in the data below:

Level Ordering of Affixes in the Derivation of Active Participles of Class 1 Tri-consonantal Verb Stems in MSA and Subsequent Inflections

Prefix		Infixes and Suffixes			
Level 1 Aff]	[Verb Base]	Level 1 aff]	[Level 2 aff]	Derived AP	Gloss
-	**[daras]**	-	-	-	'he studied'
-	[[daras]	+AP]	-	[daːris]	'leaner' masc.
-	[[daras]	+AP]	+uːna]	[daːrisuːna]	'leaners' pl.masc.
-	**[farr]**	-	-	-	'he ran away'
-	[farr]	+AP]	-	[faːrr]	'fugitive' masc.

-	[[[farr]	+AP]	+uːna]	[faːrruːna]	'fugitives' pl.masc.
-	**[saʔal]**	-	-	-	'he asked'
-	[[saʔal]	+AP]	-	[saːʔil]	'questioner' masc.
-	[[[saʔal]	+AP]	+uːna]	[saːʔiluːna]	'questioners' pl.masc.
-	**[baːʕ]**	-	-	-	'he sold'
-	[[baːʕ]	+AP]	-	[baːʔiʕ]	'seller' masc.
-	[[[baːʕ]	+AP]	+uːna]	[baːʔiʕuːna]	'sellers' pl.masc.
-	**[waʕad]**	-	-	-	'he promised'
-	[[waʕad]	+AP]	-	[waːʕid]	'promisor' masc.
-	[[[waʕad]	+AP]	+uːna]	[waːʕiduːna]	'promisors' pl.masc.
-	**[ramaː]**	-	-	-	'he threw'
-	[[ramaː]	+AP]	-	[raːmiː]	'thrower' masc.
-	[[[ramaː]	+AP]	+uːna]	[raːmuːna]	'throwers' pl.masc.

3.1.5   Derivation of Active Participles of Classes 2-10 Verb Stems and Subsequent Inflections (Verb → Active Participle)

This process involves attaching a prefix *mu-* to the verb base followed by a change within the verb base depending on the class to which the verb belongs. The resultant AP may be followed by subsequent inflectional morphemes as shown below:

(15)   der.pfx   verb base   infl.sfx   →   Derived AP

(i)   [[mu+   [nassaq]]   +uːna]   →   [munassiquːna]
                                                                        'coordinators' pl.masc.

(ii)   [[mu+   [saːʕad]]   +uːna]   →   [musaːʕiduːna]
                                                                        'helpers' pl.masc.

Level Ordering in the Derivation of Active Participles of Classes 2-10 Verb Stems and Subsequent Inflections

Prefix		Infixes	and		
		Suffixes			
[Level 1 aff]	[Verb Base]	[Level 2 aff]	[Level 2 aff]	Derived AP	Gloss
	CLASS 2 VERBS				
	[nassaq]	-	-	-	'he coordinated'
[mu+	[nassaq]]	+AP]	-	[munassiq]	'coordinator'sing.masc.
[[mu+	[nassaq]]	+AP]	+uːna]	[munassiquːna]	'coordinators' pl.masc.
	CLASS 3 VERBS				
	[saːʕad]	-	-	-	'he assisted'
[mu+	[saːʕad]]	+AP]	-	[musaːʕid]	'Assistant' masc.
[[mu+	[saːʕad]]	+AP]	+uːna]	[musaːʕiduːna]	'Assistants' pl.masc.
	CLASS 4 VERBS				

	[ʔaxbar]	-	-	-	'he informed'
[mu+	[ʔaxbar]]	+AP]	-	[muxbir]	'informer' sing.masc.
[[mu+	[ʔaxbar]]	+AP]	+uːna]	[muxbiruːna]	'informers' pl.masc.

CLASS 5 VERBS

	[taxarradʒ]	+AP]	-	-	'he graduated'
[mu+	[taxarradʒ]]	+AP]	-	[mutaxarridʒ]	'graduate' sing.masc.
[[mu+	[taxarradʒ]]	+AP]	+uːna]	[mutaxarridʒuːna]	'graduates' pl.masc.

CLASS 6 VERBS

	[tasaːmaħ]	-	-	-	'he tolerated'
[mu+	[tasaːmaħ]]	+AP]	-	[mutasaːmiħ]	'tolerant person' sing. masc.
[[mu+	[tasaːmaħ]]	+AP]	+uːna]	[mutasaːmiħuːna]	'tolerant people' pl.masc.

CLASS 7 VERBS

	[ʔinʕazal]	-	-	-	'he isolated himself'
[mu+	[ʔinʕazal]]	+AP]	-	[munʕazil]	'isolated' sing.masc.
[[mu+	[ʔinʕazal]]	+AP]	+uːna]	[munʕaziluːna]	'isolated' pl.masc.

CLASS 8 VERBS

	[ʔittafaq]	-	-	-	'he agreed'
[mu+	[ʔittafaq]]	+AP]	-	[muttaffiq]]	'person in agreement' sing.masc.
[[mu+	[ʔittafaq]]	+AP]	+uːna]	[muttaffiquːna]	'people in agreement' pl.masc.

CLASS 9 VERBS

	[ʔiħmarr]	-	-	-	'it became red'
[mu+	[ʔiħmarr]]	+AP]	-	[muħmirr]*	'that which makes something red'

CLASS 10 VERBS

	[ʔistaθmar]	-	-	-	'he invested'
[mu+	[ʔistaθmar]	+AP]	-	[mustaθmir]	'investor' sing.masc.
[[mu+	[ʔistaθmar]	+AP]	+uːna]	[mustaθmiruːna]	'investors' pl.masc.

3.1.6 Derivation of Passive Participles of Class I Tri-consonantal Verb Stem and Subsequent Inflections   V   →   AP

This process involves adding the nominalizing prefix *ma-* to a word base at Level 1 followed by other affixes at both Levels 1 and 2 ordered hierarchically as shown below:

(16)   der.pfx   verb base   infl.sfx   →   New word

[[ma+   [ʔamar]]   +uːna]   →   [maʔmuːruːna]

'they are ordered' pl.masc.

These morphological processes are illustrated in the data below:

Level Ordering of Affixes in the Derivation of Passive Participles of Class 1 Verb Stems in MSA and Subsequent Inflections

Prefix		Infixes and Suffixes			
Level 1 Aff]	[Verb Base]	[Level 1 aff]	[Level 2 aff]	Derived PP	Gloss
	[sadʒan]	-	-	-	'he imprisoned'
[ma+	[sadʒan]]	+PP]	-	[masdʒuːn]	'prisoner' masc.
[[ma+	[sadʒan]]	+PP]	+uːna]	[masdʒuːnuːna]	'prisoners' pl.masc.
	[radd]	-	-	-	'he returned'
[ma+	[radd]]	+PP]	-	[marduːd]	'returned' sing.masc.
[[ma+	[radd]]	+PP]	+uːna]	[marduːduːna]	'returned' (people) pl.masc.
	[saʔal]	-	-	-	'he asked'
[ma+	[saʔal]]	+PP]	-	[masʔuːl]	'responsible' (person) masc.
[[ma+	[saʔal]]	+PP]	+uːna]	[masʔːluːna]	'responsible' pl.masc.
	[qaːl]	-	-	-	'he said'
[ma+	[qaːl]]	+PP]	-	[maquːl]	'utterance'
[[ma+	[qaːl]]	+PP]	+at]	[maquːlat]	'utterances'
	[waʕad]	-	-	-	'he promised'
[ma+	[waʕad]]	+PP]	-	[mawʕuːd]	'promised' sing.masc.
[[ma+	[waʕad]]	+PP]	+at]	[mawʕuːdat]	'promised' pl.masc/fem.

3.1.7 Derivation of Passive Participles of Classes 2-10 Verb Stem and Subsequent Inflections (Verb → Passive Participle)

As is the case with PPs derived from Class 1 verbs, this process also involves prefixing the nominalizing prefix *mu-* at level 1 followed by other level 2 affixes hierarchically ordered as shown below:

(17)   der.pfx   verb base   infl.sfx   →   Derived PP

    [[[mu+   [nassaq]]   +uːna]   →   [munassaquːna]

                          'coordinated' pl.masc.

These morphological processes are illustrated in the data below:

Prefix Level aff]	[Verb Base]	Suffixes [Level 2 aff]	Derived PP	Gloss
	CLASS 2 VERBS			
	[nassaq]	-	-	'he coordinated'
[mu+	[nassaq]]	-	[munassaq]	'coordinated' sing.masc.
[[mu+	[nassaq]]	+uːna]	[munassaquːna]	'coordinated' pl.masc.
	CLASS 3 VERBS			
	[xaː t̠ˤab]	-	-	'he addressed'

[mu+	[xaːt̪ˤab]]	-	[muxaːt̪ˤab]	'Addressee' sing.masc.
[[mu+	[xaːt̪ˤab]]	+uːna]	[muxaːt̪ˤabuːna]	'Addressees' pl.masc.

CLASS 4 VERBS

	[ʔadʒbar]	-	-	'he compelled'
[mu+	[ʔadʒbar]	-	[mudʒbar]	'compelled' sing.masc.
[[mu+	[ʔadʒbar]	+uːna]	[mudʒbaruːna]	'compelled' pl.masc.

CLASS 5 VERBS

	[tadarrab]	-	-	'he practiced' intr.
[mu+	[tadarrab]]	-	[mutadarrab]	'practiced' sing.masc.
[[mu+	[tadarrab]]	+uːn]	[mutadarrabuːn]	'trained' pl.masc.

CLASS 6 VERBS

	[tanaːwal]	-	-	'he dealt with'
[mu+	[tanaːwal]]	-	[mutanaːwal]	'dealt with' sing.masc.
[[mu+	[tanaːwal]]	+at]	[mutanaːwalat]	'dealt with' pl.masc/fem

CLASS 7 VERBS

	[ʔintaħal]	-	-	'the impersonated'
[mu+	[ʔintaħal]	-	[muntaħal]]	'impersonated' sing. masc.
[[mu+	[ʔintaħal]	+uːn]	[muntaħaluːn]	'impersonated' pl.masc.

CLASS 8 VERBS

	[ʔintaxab]	-	-	'he elected'
[mu+	[ʔintaxab]]	-	[muntaxab]	'elected' sing.masc.
[[mu+	[ʔintaxab]]	+uːn]	[muntaxabuːn]	'elected' pl. masc.

CLASS 9 VERBS

	[ʔiħmarr]	-	-	'it became red'
[[[mu+	[ʔiħmarr]]	-	[muħmarr]	'reddened' sing.masc.
[[[mu+	[ʔiħmarr]]	+at]	[muħmarrat]	'reddened' pl.masc./fem.

CLASS 10 VERBS

	[ʔistaxradʒ]	-	-	'he extracted'
[[[mu+	[ʔistaxradʒ]]	-	[mustaxradʒ]	'extracted' sing.masc.

3.1.8 Derivation of the [faʕlaːn] Adjective and Subsequent Inflections (Verb → Adjective)

This involves affixing to the verb base the adjective forming suffix -ʕaːn followed by other affixes in a hierarchical manner as shown below:

(18)   verb base der.aff infl.sfx   →   Derived Adjective

   [[[taʕib] +Adj] +uːn]   →   [taʕbaːnuːn]

                                        'tired' (people) pl.masc.

These morphological processes are illustrated in the data below:

Prefix		Infixes and Suffixes			
Level 1 Aff]	**[Verb Base]**	**[Level 1 aff]**	**[Level 2 aff]**	**Derived Adjective**	**Gloss**
	[taʕib]	-	-	-	'he was tired'
-	[[taʕib]	+Adj]	-	[taʕbaːn]	'tired' sing.masc.
-	[[taʕib]	+Adj]	+uːn]	[taʕbaːnuːn]	'tired' pl.masc.
	[ɣad̪ˤib]	-	-	[ɣad̪ˤib]	'he was angry'
-	[[ɣad̪ˤib]	+Adj]	-	[ɣad̪ˤbaːn]	'angry' sing.masc.
-	[[ɣad̪ˤib]	+Adj]	+uːn]	[ɣad̪ˤbaːnuːn]	'angry' pl.masc.
	[naʕis]	-	-	-	'he dozed'
-	[[naʕis]	+Adj]	-	[naʕsaːn]	'dozing' sing.masc.
-	[[naʕis]	+Adj]	+uːn]	[naʕsaːnuːn]	'dozing' (pl.masc.
	[xasir]	-	-	-	'he lost'
-	[[xasir]	+Adj]	-	[xasraːn]	'loser' sing.masc.
-	[[xasir]	+Adj]	+uːn]	[xasraːnuːn]	'losers' (pl.masc.
	[ʕaˌt̪ˤiʃ]	-	-	-	'he was thirsty'
-	[[ʕaˌt̪ˤiʃ]	+Adj]	-	[ʕaˌt̪ˤʃaːn]	'thirsty' sing.masc.
-	[[ʕat̪ˤiʃ]	+Adj]	+uːn]	[ʕaˌt̪ˤʃaːnuːn]	'thirsty' pl.masc.
	[ʃabiʕ]	-	-	-	'he was satisfied'
-	[[ʃabiʕ]	+Adj]	-	[ʃabʕaːn]	'satisfied' sing.masc.
-	[[[ʃabiʕ]	+Adj]	+uːn]	[ʃabʕaːnuːn]	'satisfied' pl.masc.

3.1.9 Derivation of Adjectives from Adverbs and Subsequent Inflections (Adverb → Adjective)

This involves affixing to the adverb the adjective forming- suffix *-ijj* at level 2, which may be followed by other suffixes at level 2 hierarchically ordered as shown below:

(19)   Adverb   der.sfx infl.sfx →   Derived word

[[[ʔamaːm]   +ijj]   +uːn] →   [ʔamaːmijjuːn]

'to the fore'(people) pl.masc.

The derivational and inflectional processes are illustrated as follows:

Level Ordering of Affixes in the Derivation of Adjectives from Adverbs and Subsequent Inflections

Prefix		Suffixes			
Level 1 aff]	**[Adverb]**	**[Level 2 aff]**	**[Level 2 aff]**	**Derived Adjective**	**Gloss**

Prefix	[Adverb]	Level 1 aff	Level 2 aff	Derived word	Gloss
	[ʔamaːm]	-	-		'infront'
-	[[ʔamaːm]	+ijj]	-	[ʔamaːmijj]	'at the fore' sing.masc.
-	[[[ʔamaːm]	+ijj]	+uːn]	[ʔamaːmijjuːn]	'at the fore' pl.masc.
	[wasatˤ]	-	-	[wasatˤ]	'in the middle'
-	[[wasatˤ]	+ijj]	-	[wasatˤijj]	'to the middle' sing.masc.
-	[[[wasatˤ]	+ijj]	+uːn]	[wasatˤijjuːn]	'to the middle' pl.masc.
	[xalf]				'behind'
-	[[xalf]	+ijj]	-	[[xalfijj]	'to the rare' sing.masc.
-	[[[xalf]	+ijj]	+uːn]	[xalfijjuːn]	'to the rare' p.masc.
	[dʒaːnib]	-	-	[dʒaːnib]	'beside'
-	[[dʒaːnib]	+ijj]	-	[[dʒaːnibijj]	'by the side' sing.masc.
-	[[[dʒaːnib]	+ijj]	+uːn]	[dʒaːnibijjuːn]	'by the side' pl.masc.

3.1.10 Derivation of Adverbial Nouns and Subsequent Inflections (Adverb → Noun)

This process involves affixation where affixes are attached to the adverb in a linear manner as shown below:

(20)   Adverb   der.aff   infl.aff →   New word

(i)   [[[ʔamaːm] +N]   +PL]   →   [ʔaʔimma(t)]
    'Imams' pl.masc.

(ii)   [[[wasatˤ] +N]   +PL]   →   [wusatˤa:ʔ]
    'mediators' pl.masc.

The derivational and inflectional processes are illustrated as follows:

Level Ordering of Affixes in the Derivation of Nouns from Adverbs and Subsequent Inflections

Prefix Level 1 aff]	[Adverb]	Infixes and Suffixes Level 1 aff]	[Level 2 aff]	Derived Noun	Gloss
-	**[ʔamaːm]**	-	-	-	'in front'
-	[[ʔamaːm]	+N]	-	[ʔimaːm]	'Imam' (muslim leader) masc.
-	[[[ʔamaːm]	+N]	+PL]	[ʔaʔimma(t)]	'Imams' pl.masc.
-	**[wasatˤ]**	-		-	'middle'
-	[[wasatˤ]	+N]	-	[wasiːtˤ]	'mediator' masc.
-	[[[wasatˤ]	+N]	+PL]	[wusatˤa:ʔ]	'mediators' pl.masc.
-	**[xalf]**	-	-	-	'behind'

-	[[xalf]	+N]	+at	[xali:fat]	'successor' (caliph) masc.
-					
-	[[[xalf]	+N]	+PL]	[xulafa:ʔ]	'successors' pl.masc.

3.1.11 Formation of the Broken Plural and Subsequent Inflection (Noun → Noun)

This inflectional process involves modification of the internal structure of the stem in the singular form. The data below illustrates some examples of broken (irregular) plurals in MSA.

(21)   Noun (sing)   infl.aff   infl.aff   infl.aff   →   Noun (Broken pl.)

(i)   [[[[kita:b]   +PL]   +u]   +ha:]   →   [kutubuha:]
                                                                                        'her books'

(ii)   [[[ʕilm]   +PL]   +na:]   →   [ʕulu:muna:]
                                                                                        'our sciences' .

This inflectional process may be illustrated as follows:

Level Ordering of Affixes in the Formation of Broken Plurals and Subsequent Inflections

Prefix Level 1 Aff]	[Noun Base]	Infixes and Suffixes Level 1 Aff]	[Level 2 aff]	[Level 2 aff]	Broken plural	Gloss
-	**[kita:b]**	-	-	-	-	'book'
-	[[kita:b]	+PL]	-	-	[kutub]	'books'
-	[[[kita:b]	+PL]	+u]	-	[kutubu]	'books' nom.
-	[[[[kita:b]	+PL]	+u]	+ha:]	[kutubuha:]]	'her books'
-	**[ʔusta:ð]**	-	-	-	-	'teacher' masc.
-	[[ʔusta:ð]	+PL]	-	-	[ʔasa:tiðat]	'teachers' pl.msc.
-	[[[ʔusta:ð]	+PL]	+u]	-	[ʔasa:tiðatu]	'teachers' pl.msc.ind.
-	[[[[ʔusta:ð]	+PL]	+u]	+na:]	[ʔasa:tiðatuna:]	'our teachers' pl.msc.
-	**[ħaqq]**	-	-	-	-	'a right'
-	[[ħaqq]	+PL]	-	-	[huqu:q]	'rights'
-	[[[ħaqq]	+PL]	+u]	-	[huqu:qu]	'rights' ind.
-	[[[[ħaqq]	+PL]	+u]	+kum]	[huqu:qukum]]	'your rights' pl.masc.

3.1.12 Level Ordering in Verb Inflections (Verb → Verb)

As stated earlier in this study, inflectional affixes are used to mark tense, gender, possession, case and definiteness. The addition of inflectional affixes occurs strictly at Level 2 of the hierarchy. The following examples illustrate the process of adding inflectional affixes to the verb in MSA:

(22)   infl.pfx   Verb base   infl.sfx   infl.sfx   infl.sfx   →   Verb

(i)   [[[ʔa + [xaradʒ]]   + na:]   + hum] →   [ʔaxradʒna:hum]
                'he went out'   'we removed them' pl.masc.

(ii)   -   [[[[ʕalim]]   +V]   + tum:]   + u:ni:] →   [ʕallamtumu:ni:]

'he/it knew'   'you taught me' pl.masc.

These morphological processes can be illustrated as follows:

Level Ordering of Affixes in the Inflection of Verbs

Prefix Level 2 aff]	[Verb Base]	Level 2 aff]	[Level 2 aff]	[Level 2 aff]	New verb	Gloss
		Infixes and Suffixes				
-	**[xaradʒ]**	-	-	-	-	'he went out'
[ʔa+	[xaradʒ]]	-	-	-	[ʔaxradʒ]	'he removed'
[[ʔa+	[xaradʒ]]	-	+na:]	-	[ʔaxradʒna:]	'we removed'
[[[ʔa+	[xaradʒ]]	-	+na:]	+ha:]	[ʔaxradʒna:ha:]	'we removed her'
-	**[ʕalim]**	-	-	-	-	'he knew'
-	[[ʕalim]	+V]	-	-	[ʕallam]	'he taught'
-	[[[ʕalim]	+V]	+at]	-	[ʕallamat]	'she taught'
-	[[[[ʕalim]]	+V]	+at]	+hum]	[ʕallamathum]	'she taught them' pl.masc.

4.0   Conclusion

In this paper, we have outlined the various morphological processes involved in the derivation and inflection of MSA words within the limitations of lexical morphology. We have established that indeed the MSA lexicon is hierarchically sructured. This is evident in the fact that both inflectional and derivational word formation processes in MSA can be displayed on a series of strata which are interlinked. The processes begin with an underived lexical item which goes through a level 1 morphological process of affixation. Thereafter, the derived word goes through another morphological process of affixation at level 2.

We have also established that the MSA lexicon is organized into two strata; which we labeled Stratum 1 and Stratum 2. Stratum 1 consists of two morphological processes; namely: primary derivation and primary inflection. We identified, under primary derivation, processes such as the derivation of infinitive and deverbative verbal nouns, active and passive participles, adverbial nouns as well as nouns of instrument and place. Primary inflection includes the formation of broken plurals, dimunitives and elatives.

Stratum 2 involves secondary derivation and secondary inflection where Secondary derivation is a regular process that involves the affixation of level 2 affixes to the word stem such as the derivation of adjectives from nouns as well as from adverbs. Secondary inflection is manifested in the affixation of morphemes to represent gender, number, tense, case, definiteness and possession. The discussion has concluded that the Lexical Morphology's hierarchical structure of the lexicon is as much valid as it is also applicable to the MSA lexicon.

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