The Formation of Arabic Passive Verbs: Lexical or Syntactic?[*]

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1. Introduction

This paper examines the productivity of the formation of passive verbs and their distribution in Modern Standard Arabic and Palestinian Arabic (hereafter MSA and PA, respectively). I account for the differences between the morphology of passivization in both languages, advancing two independent claims. First, I contend that passivization in MSA is syntactic, while PA passivization is lexical. This is based on morphological features of the operations in both languages, such as productivity, transparency, the type of morphological process and exclusivity. Second, I show that a word-based derivation captures the generalizations about passivization in these languages and therefore should be favored. Specifically, I argue passivization in PA can be explained on the basis of stem modification rather than the extraction of a consonantal root. This is because root extraction cannot account for the lexical gaps in passivization.

The paper is organized as follows. Section 2 discusses valence changing operations, their cross-linguistic application and differences. In section 3, I turn to verbal passivization and its syntactic-semantic and morpho-phonological features. This section observes the morpho-phonological differences between MSA and PA passivization that results, as I argue, from the component of the grammar where passivization takes place. I will show that the two types of morphology that characterize each operation of passivization coincide with other morpho-phonological criteria that distinguish between lexical and syntactic operations. I turn next in section 4 to present a word-based approach for passivization, arguing that it captures the underlined generalization with regard to existing and non-existing passive verbs, and should therefore be favored over a root-based derivation.

2. Valence changing operations

It is commonly assumed that different thematic realizations of the same concept (e.g. active and passive) are derived by valence changing operations. Such operations manipulate the thematic grids of verbs by

adding or reducing thematic roles, yielding predicates such as passive, causative and reciprocal verbs. While valence changing operations apply cross-linguistically, languages demonstrate various differences with regard to operations such as reflexivization (Reinhart & Siloni 2005, Horvath & Siloni 2005, 2008, Siloni 2005). Reinhart & Siloni (2005) suggest that thematic operations, which affect the syntactic valence of a verb, are allowed to apply in the lexicon or in the syntax, as formulated in the following parameter.

(1) The Lex-Syn Parameter (Reinhart & Siloni 2005)
     UG allows thematic operations to apply in the lexicon or in the syntax.

There are languages such as Hebrew and Hungarian whose parameter is set to 'lexicon', while there are languages such as French and Romanian, whose parameter is set to 'syntax'. The differences between such languages are manifested in syntactic-semantic features. In this framework, the grammar includes an active lexicon (Levin and Rappaport Hovav 1994, 1995, Reinhart 2002, Siloni 2002), which is more than a mere list of items, and allows the application of derivational operations. The lexicon is regarded as an interface between the conceptual system and the computational system. From the thematic point of view, it contains coded concepts, along with their thematic grids, and it functions as a computational component, which can perform valence changing operations pre-syntactically.

Thematic operations usually result in at least two related verbs. These realizations are mostly morphologically distinct (e.g. *katab* 'write' and *inkatab* 'be written' in PA). That is, valence changing operations are, to a large extent, manifested in morphological processes. Such related verbs in MSA and PA share the same consonants and are represented in different prosodic templates. Each template indicates the phonological shape of the verb, i.e. its vowels, its prosodic structure and its affixes (if any). The phonological shape of a verb is essential for determining the shape of other forms in the inflectional paradigm (Berman 1978, Bolozky 1978, Bat-El 1989, Aronoff 1994). The possible prosodic templates in MSA and PA are demonstrated in (2) and (3) respectively.

(2) MSA Prosodic Templates[1]

Perfect	Imperfect
faʕal	ya-fˤa/i/ul
faʕʕal	yu-faʕʕil
faaʕal	yu-faaʕil
ʾafˤal	yu-fˤil
tafaʕʕal	ya-tafaʕʕal
tafaaʕal	ya-tafaaʕal
ʾinfaʕal	ya-nfaʕil
ʾiftaʕal	ya-ftaʕil
ʾistafˤal	ya-stafˤil

(3) PA Prosodic Templates

Perfect	Imperfect
faʕal	yi-fˤa/i/ul
faʕʕal	yi-faʕʕel
faaʕal	yi-faaʕel
afˤal	yu-fˤil
tfaʕʕal	ya-tfaʕʕal
tfaaʕal	ya-tfaaʕal
infaʕal	ya-nfaʕil
iftaʕal	ya-ftaʕil
istafˤal	ya-stafˤil

3. Verbal passivization

Passivization involves an operation labeled saturation, which saturates the external theta role by existential closure (Chierchia 1989/2004, Reinhart and Siloni 2005). The theta role is assigned to a variable bound by an existential operator. The external argument is no longer syntactically accessible, but it is still accessible on the level of interpretation. Passivization applies to predicates that bear both an external and an internal theta role. The passive verb loses the ability to assign an accusative case, and the internal argument moves to the subject position to receive a case. Passivization does not include manipulation of the theta grid. Horvath and Siloni (2005, 2006, 2008) provide evidence that verbal passivization is syntactic. They base their argument on features such as semantic drifts, nominalizations and idioms. I argue that while this is the case in MSA passivization, PA passivization applies in the lexicon. I argue that the Lex-Syn parameter has morpho-phonological consequences as well (Laks 2006, 2007); once the parameter value is set, a cluster of three morpho-phonological properties follows. I will show morpho-phonological

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[1] This does not include inflectional pronoun suffixes, which are concatenated to the stem for agreement purposes.

evidence that PA passivization demonstrates similar morphological features that are also shared by other thematic operations such as reflexivization and reciprocalization.
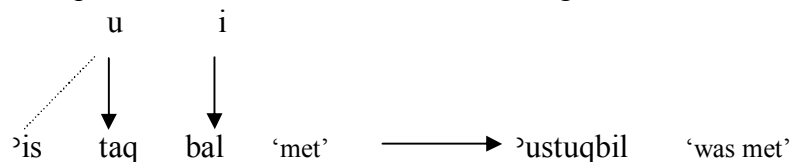
3.1. MSA passivization

Passivization applies productively in MSA. It is possible to form a passive counterpart for each transitive verb. Passivization is performed by melodic overwriting, in which the vocalic pattern of a transitive verb changes into *u-i and u-a* in the perfective (4a) and imperfective (4b) forms respectively.

(4)   MSA Passivization

| Base	Derived Form	
a. Perfective form		
kasar	kusir	'broke'
saaʕad	suuʕid	'helped'
ʾarsal	ʾursil	'sent'
tanaawal	tunuuwil	'handled'
ʾintaxab	ʾuntuxib	'elected'
ʾistaqbal	ʾustuqbil	'met'
b. Imperfective form		
yaksur	yuksar	'break'
yusaaʕid	yusaaʕad	'help'
yursil	yursal	'send'
yatanaawal	yutanaawal	'handle'
yantaxib	yuntaxab	'elect'
yastaqbil	yustaqbal	'meet'

When the verb exceeds the minimal word size (a binary foot), one of the vowels of the passive pattern spreads to the rest of the syllables. In the perfective form, the last vowel of the stem changes to /i/ and the preceding one to /u/. The /u/ spreads to the preceding syllable (5).

(5)   MSA perfective forms: Melodic Overwriting

         u   i

ʾis   taq   bal   'met'   ⟶   ʾustuqbil   'was met'

In the imperfective form, the first vowel turns into /u/ and the second one into /a/ which spreads to the rest of the word (6).

(6)   MSA imperfective forms: Melodic Overwriting

         u   a

yas   taq   bil   'meet'   ⟶   yustaqbal   'is met'
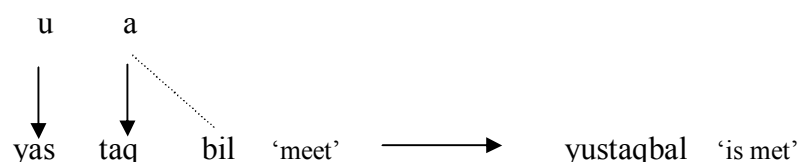
MSA passivization has several morpho-phonological features that coincide with the type of morpho-phonology that applies in the syntax.

3.1.1. Types of morphological processes

The relations between active predicates and their passive counterparts exhibit only melodic overwriting; the prosodic structure in both forms is identical and thus vacuously assigned. Melodic overwriting does not involve reference to the consonantal root (Bat El 2002) as it operates directly on the stem. Melodic overwriting applies to the segmental level only. It involves changing the quality of the stem vowels without changing the stem's prosodic shape and is therefore considered less intrusive. Other thematic operations in MSA such as decausativization, reflexivization and reciprocalization have different morphological manifestations. These operations are performed by more intrusive processes that manipulate the prosodic structure of the base by changing either the number of syllables or their structure. Other derived predicates in MSA are formed by either adding a prefix in the formation of a reflexive (7a) or a reciprocal verb (7b), or by gemination 4(7c,d) in the formation of causative verbs (7c,d). In both cases the prosodic structure of the base does not remain intact.

(7)   Lexical operations in MSA

Base		Derived form	
a. maššat'	'comb'	maššat'	'comb oneself'
b. kaatab	'correspond with'	takaatab	'correspond with each other'
c. raqas'	'dance'	raqqas'	'make X dance'
d. ħamal	'carry'	ħammal	'make X carry'

3.1.2. High productivity

The formation of MSA passive verbs is exception free and regarded as syntactic (Horvath and Siloni 2005, Laks 2007a,b). There are no morpho-phonological, syntactic or semantic constraints that block passivization and passive verbs can be formed from any transitive verb, regardless of its template. The morphological component of the grammar is 'blind' with regard to the template of transitive active verbs. It is a free mechanism that can take any transitive verb, change its vowels and form a passive counterpart. This transparent and non-conditioned formation is typical to processes that are assumed to apply in the syntax in general such as inflection and provides further support to the proposed nature of the syntax as a module of the grammar that manufactures forms productively with a relatively small portion of idiosyncrasies and blocking affects.

3.1.3. Exclusivity and transparency

MSA passive verbs have an exclusive passive meaning. Melodic overwriting of verbal forms has a unique function with regard to valence changing, as forms with the vocalic pattern of *u-i* or *u-a* do not host other types of predicates. This makes the morphological process that is responsible for passivization highly transparent as these overwritten forms are exclusively identified as passive. This correlates with the transparency of the processes that apply in the syntax in general. In contrast, verbs that are the result of lexical operations do not always have only one meaning, which makes the morphological process that is responsible for their formation less transparent. Templates that are formed by affixation or gemination can host many types of predicates. The *faᶜal* template, for example, is used for both causative verbs that are derived by adding a thematic role (e.g. *darras* 'teach', causative of *daras* 'study'), as well as for basic entries in the lexicon that are not derived from any other predicate (e.g. *mawwal* 'finance'). As I will demonstrate in 3.2 , PA passive forms, which are argued to be lexical, can have other meanings such as decausative or reflexive.

3.2. PA Passivization

The formation of passive verbs is different with regard to PA, where melodic overwriting does not apply and hence PA passive verbs are indeed rare. Such formation does not exist in other dialects of Arabic as well (see Hallman 2002, for example, for discussion of Lebanese Arabic). Nonetheless, there are passive forms in PA that are formed in two main templates: *infaᶜal* and *tfaᶜᶜal* (See also Rosenhouse 1991/1992, Younes 2000 and Tucker 2007).[2] This is performed by agglutinating the prefix *t-* on *in-* to active verbs in the *faᶜal* and *faᶜᶜal* templates respectively.

I contend that the difference between passivization in MSA and PA results from the component of the grammar where the operation applies. I argue that PA passivization is lexical and that morpho-phonological criteria restrict its application. PA passivization demonstrates several morpho-phonological features that fall under the nature of morpho-phonology that applies in the lexicon.

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[2] The data in this paper is also based on Elihay (2005).

3.2.1. Types of morphological processes

Passivization is possible is PA only when the input transitive verb is formed in certain templates, *faʕal* and *faʕʕal*. The former is used as a base for *infaʕal* passive verbs (8a), while the latter is used for the formation of *tfaʕʕal* passive verbs (8b).[3] In both cases, the morphological process that applies is relatively simple as it only involves adding a prefix *in-* or *t-* to the active verb form. However, such a formation is more intrusive with respect to the base form as it changes its prosodic structure by adding a new syllable. MSA passivization, in contrast, changes only the vocalic pattern, while the prosodic structure remains intact (see 3.1).

(8)   PA Passivization

Base	Derived Form	
a. faʕal → infaʕal formation		
baʕa	inbaʕ	'buy'
katab	inkatab	'write'
qal	inqaal	'say'
qara	inqara	'read'
saraq	insaraq	'steal'
ħaka	inħaka	'speak'
ħakam	inħakam	'sentence'
bana	inbana	'build'
ʕarad'	inʕarad'	'show'
b. faʕʕal → tfaʕʕal formation		
s'allaħ	ts'allaħ	'fix'
laxxas'	tlaxxas'	'sum up'
barra	tbarra	'acquit'
naffaz	tnaffaz	'implement'
raqqa	traqqa	'promote'

3.2.2. Low Productivity

PA is not entirely productive even with regard to *faʕal* and *faʕʕal* transitive verbs, in comparison to MSA passivization. There are transitive verbs formed in these two templates that do not have passive counterparts (9) for no apparent reason.

(9)   PA transitive verbs with no passive alternates

Base	Derived Form	
a. faʕal verbs		
wajad	*inwajad	'find'
rasam	*inrasam	'draw'
tarak	*intarak	'leave'
b. faʕʕal verbs		
zayyaf	*tzayyaf	'forge'
was's'a	*twassa	'recommend'
mawwal	*tmawal	'finance'

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[3] There are some cases where the *faaʕal* template is used for transitive verbs and their passive counterparts are formed in *tfaaʕal*, e.g. *qaas'as' → tqaas'as'* 'punish'. This is the same formation as the *faʕʕal → tfaʕʕal* one, which is more common.

Any of the transitive verbs in (9) could conceptually have a passive alternate. Indeed, such verbs do undergo passivization in other languages. The verb *zayyaf* 'forge' for example, has a passive alternate in MSA (*zuyyif* 'be forged') and no such alternate in PA. This low productivity is typical to thematic operations that apply in the lexicon in PA, such as reflexivization and reciprocalization (Laks 2007a,b). There are PA transitive verbs that do not have reflexive and reciprocal alternates. It follows that PA passivization is not productive as it also applies in the lexicon, like other operations.

3.2.3. The lack of exclusivity and transparency

Verbs that are derived via lexical operations can share more than one meaning, i.e. the same form is used as the output of more than one operation. The *infaʕal* and *tfaʕʕal* templates are not used exclusively for passive verbs, in contrast to the overwritten forms in MSA that are used only for passivization. PA passive templates also host other types pf predicates. The *tfaʕʕal*, for example, is used for the formation of predicates that are derived by other lexical operations such as decausativization (10a) and reflexivization (10b) as well as basic entries in the lexicon (10c).

(10)   Non-passive verbs formed in tfaʕʕal

a. Decausatives	
twassax	'get dirty'
tɣayyar	'change'
twarratˤ	'get mixed up'
b. Reflexives	
tɣassal	'wash'
tħammam	'bathe'
txabba	'hide oneself'
c. Basic entries	
twakkal	'have confidence'
twaqqaʕ	'expect'
tɣada	'have lunch'
traddad	'hesitate'
tħadda	provoke'

The *infaʕal* template, which is primarily used for passive and decausative predicates, can also host basic entries in the lexicon (11).

(11)   Basic entries formed in infaʕal
    intabah   'pay attention'
    inta:q   'be bearable'
    indˤamm   'join, become part of'
    infarad   'be unique'

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Consequently, verbs that are formed in the *infaᶜal* and *tfaᶜᶜal* templates are not automatically considered as passive, as they are used for various predicates. Again, MSA passive forms are immediately identified as passive, as templates with the *u-i* or *u-a* melody can only have a passive meaning.

In contrast to MSA passivization, the mechanism that forms passive verbs in PA is not 'blind' with regard to the template of the active counterpart. The morphological component in the grammar has to know the template of the active transitive verb and accordingly form its passive alternate in the appropriate template. There is a one-to-one relation between the templates of active and passive verbs in PA, while is MSA there is an across-the-board mechanism that forms any transitive verb, regardless of its template.

3.2.4. Blocking of passive verb formation in PA

There are many PA transitive verbs in other templates which have no passive alternates. The verbs in (12) are transitive verbs in templates such as *iftaᶜal* and *istafᶜal* that are appropriate candidates for passivization, but have no derived counterparts. Note that their MSA counterparts can easily undergo passivization by melodic overwriting (see (4)).

(12)   Blocking of passivization

Template	Base	Derived Form	
istafᶜal	istaxraj	---------	'extract'
	istaqbal	---------	'welcome'
	istawᶜab	---------	'absorb'
	istawrad	---------	'import'
	istaʾjar	---------	'hire'
	istaᶜrad'	---------	'review'
iftaᶜal	irtakab	---------	'commit'
	intaqad	---------	'criticize'
	iqtaraħ	---------	'suggest'
	intaxab	---------	'elect'
tfaᶜᶜal	tbanna	---------	'adopt'
	tħammal	---------	'bear, stand'
afᶜal	abt'al	---------	'cancel, disarm'
	alɣa	---------	'cancel'

Which factors prevent the formation of such passive verbs? There seems to be no thematic, syntactic or pragmatic reason for this blockage of

valence changing. Furthermore, passive counterparts of such verbs exist in other languages cross-linguistically (e.g. MSA, Hebrew and English).[4]

I claim that the reason is morpho-phonological. Forming such passive verbs in one of the passive templates would involve a rather complex morpho-phonology. Non-existing but theoretically possible forms such as *inqaraħ or *tqarraħ ('be suggested') and cannot be derived directly from transitive alternates *iqtaraħ* 'suggest' only by adding a prefix.[5] The morphological component cannot handle such formations and therefore they are entirely blocked. Such a restriction is typical of derivations that apply in the lexicon. The lexicon, in this view, contains a set of morphological rules for the formation of templates, which specify how new words can be formed (Booij 2004).

The low productivity of PA passivization and the morphological restrictions on it support the claim that it applies in the lexicon. There are far fewer restrictions on thematic operations that apply in the syntax, where the morpho-phonology is more transparent and less subject to constraints.

4. Forming PA passive verbs in a word-based derivation

The word-based approach, originally proposed in Aronoff (1976), is based on the notion that the lexicon consists of words rather than morphemes or roots. Word-based morphology is the idea that morphology is primarily a set of systematic relations between the forms and meanings of the words of a language, where words are created from existing words (see also Corbin 1989, Booij 2008). The source of morphological relations is the network of paradigmatic relations between the existing words of the language (Van Marle 1985, Spencer 1988, Corbin 1989, Anderson 1992, Steriade 2000, Stump 2001, McCarthy 2005 Booij 1996 among others).

There are two main approaches to the relation between a consonantal root and a vocalic template in Semitic languages, such as MSA and PA. The traditional approach attributes the core meaning of the stem to the consonantal root, which consists of 2-4 consonants in a specific order, thus expressing the semantic relations between stems. This view is structurally expressed by the multi-tiered representation proposed by McCarthy (1981),

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[4] See Doron 1999, 2003, Landau 2002, Horvath & Siloni 2005 and Meltzer 2006 for discussion of the productivity of passivization in Hebrew, and Ravid et al. 2003 and Armon-Lotem and Koren 2006 for the acquisition of Hebrew passivization.

[5] There are a few exceptions such as *iɣtasab* 'rape' and *inɣasab* 'be raped'. I assume such forms are lexicalized and that such formations are not an active part of PA morphology.

where the vocalic patterns are represented independently, on the basis of morphological categories. Deriving new forms involves the extraction of a consonantal root from the base form and associating it with a given template (Bat-El 1986). However, this approach invokes both a theoretical and empirical problem, known as the problem of transfer (Bat-El 1994). Recent research has revealed that the information transferred from the base to the derived form not only consists of the order of the consonants, but also which consonants occupy adjacent positions in the base, i.e. whether two or more consonants form a cluster.

Stem Modification is an alternative theoretical model, which can account for generalizations about morpho-phonological alternations as it allows for internal stem adjustments. It was first introduced in Steriade (1988) in the analysis of reduplication, and in McCarthy and Prince (1990) in the analysis of the formation of the MSA broken plurals and diminutives. This theory accounts for the transfer of information, such as vowel quality, consonant adjacency and prosodic structure, from a base to a derived form. It also supplies a uniform account for cases of non-Semitic languages exhibiting phenomena similar to those found in Semitic languages (Bat-El 2002). In addition, Guerssel and Lowenstamm's (1990, 1996) analysis of Classical Arabic verbs suggests that the vowel in a derived stem can be predicted on the basis of the quality of the lexically specified vowel of the base. Various studies have shown the lack of motivation for assuming a root-based derivation (Horvath 1981, Lederman 1982, Bat-El 1994, 2001, 2002, Heath 1987, Ratcliffe 1997, Rose 1998, Ussishkin 1999, 2005 Benmamoun 2000).

Why should a word-based derivation be favored in the case of passivization? The data presented in this paper provide further support for a word-based view. Specifically, the analysis provides support for the superiority of stem modification over root extraction (Bat-El 1994, Ussishkin 1999, 2005). If verbs in PA were formed by extracting a consonantal root, there would be no reason for gaps in passive verb formation. A consonantal root could be extracted from any transitive verb, regardless of its template. Examine, for example, the transitive verb *itrakab* 'commit', which has no passive counterpart 'be committed'. There seems to be no morphological restriction on extracting the consonantal root r-k-b and inserting it into one of the possible passive templates, *infaʕal* or *tfaʕʕal* (yielding non-existing forms like *inrakab* or *trakkab*). However, the data

show that this process of root extraction does not take place. I contend that this is because there is no such mechanism of root extraction at all in the language. Passive verbs are derived directly from their active alternates by applying word formation rules on existing words, when such application is possible. This is performed by stem modification, where the appropriate prefix *in-* or *t-* is agglutinated based on the template of the active verb. When the active verb is not in the *faʿal* or *faʿʿal* templates, such agglutination is impossible, since this would result in a verbal form that does not conform to one of the existing binyanim.

4. Conclusions

This paper provides insight into the distribution of MSA and PA verbal templates and their productivity in passivization. The differences between the two languages are summarized in (11).

(11) Morpho-phonological properties of MSA and PA passivization

Property	MSA	PA
Type of morphological process	**Segmental changes** - melodic overwriting	**Prosodic change** - affixation
Transparency and exclusivity	**Transparent** - a unique mechanism that applies to all transitive verbs The process is exclusive for passivization	**Less transparent** – the morphological mechanism considers the template of the active verb Non-exclusive process- PA passive templates host other types of predicates
Productivity	**High** - melodic overwriting applies across the board and is exception free	**Low** - passivization is restricted to two templates due to morpho-phonological constraints

These morphological differences suggest that the two types of passivization apply in different components of the grammar. Further research should reveal syntactic and semantic differences between them. The analysis provides support for favoring stem modification over root extraction. If we assumed root extraction, there would be no way to explain morpho-phonological differences between lexical and syntactic operations. Root extraction would apply in all operations, mapping the consonantal root to different vocalic templates but it could not explain the gaps in passive formation in PA. Such an analysis gives further rise to a surface-based account, in which forms are derived from actually occurring words, rather than a system in which forms are derived by relating to an entity that never occurs in isolation on the surface.

The analysis supports the existence of an interface between morphology and both the lexicon and the syntax (Borer 1991). I have shown that there are two types of morpho-phonology, each of which interacts with a different component of the grammar. The analysis reveals the interaction between morpho-phonological and thematic considerations, thereby supporting the interface between morpho-phonology and the lexicon and the syntax. It also supports the view of the lexicon as an independent component of the grammar that is active in the generation of words (Aronoff 1976, Anderson 1977, Scalise 1984, 1988, Booij 1996, 2008 among others).

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