Journal of Education, Teaching and Social Studies
ISSN 2642-2336 (Print) ISSN 2642-2328 (Online)
Vol. 4, No. 3, 2022
www.scholink.org/ojs/index.php/jetss

Original Paper

The Phonological Word in Najdi Arabic

Alwaleed A. Alsuhaibani[1*]

[1] King Khalid Military Academy, Department of Civil Studies, English Division, Riyadh, Saudi Arabia

[*] Alwaleed A. Alsuhaibani, King Khalid Military Academy, Department of Civil Studies, English Division, Riyadh, Saudi Arabia

Received: July 18, 2022 Accepted: August 10, 2022 Online Published: August 16, 2022

doi:10.22158/jetss.v4n3p55 URL: http://dx.doi.org/10.22158/jetss.v4n3p55

Abstract

Numerous studies on Arabic linguistics make reference to the phonological word (PW) as a constituent that serves as the domain for various phonological phenomena, however, there is no clear and precise definition in the Arabic linguistics literature of what actually constitutes as a PW and whether it consists of just the bare morphological stem or whether it includes affixes as well. The purpose of this paper is to gain a better understanding of the status of this phonological constituent in Najdi Arabic (NA), a variety of Arabic spoken in Najd, located in the central region of Saudi Arabia. Affixation and other phonological processes are thoroughly investigated to examine how they interact with the stem in an attempt to give an accurate and precise definition of the domain of the PW. Using syllabification and stress placement as reliable diagnostic tools, in addition to other phonological processes, it is concluded that the PW in NA consists of the morphological stem including all affixes (i.e. prefixes and suffixes, both inflectional and derivational) and functions words (e.g., prepositions). Evidence that supports this conclusion stems from the fact that the stem plus affixes comprise the domain for syllabification and the stress assignment rules as well.

Keywords

affix, assimilation, domain, Najdi Arabic, phonological word, stress

1. Introduction

The purpose of this paper is to present a detailed analysis of the phonological word (PW) in Arabic. Numerous studies on Arabic linguistics make reference to this phonological constituent as the domain for various phonological processes, however, there is no clear and precise definition in the Arabic linguistics literature of what actually constitutes as a PW. That is, it is not clear whether the PW in Arabic consists of just the bare morphological stem with no morphological affixes attached or whether some/all affixes are also included within the PW. To the best of my knowledge, there are no previous

studies that have attempted to investigate this issue. Therefore, the goal of this study is to fill in this gap by investigating the domain of the PW in Arabic.

The dialect investigated in this study is Najdi Arabic (NA), a variety of Arabic spoken in Najd, located in the central region of Saudi Arabia. NA is perhaps one of the least studied dialects of Arabic. Thus, another goal of this study is to also document NA itself.

In order to arrive at a clear and precise definition of the PW in NA, various phonological processes such as, assimilation, affixation, syllabification, and word stress will be investigated. Affixes in particular will be exhaustively investigated to examine the effect they have, if any, on the stem to which they attach and how they interact with word stress.

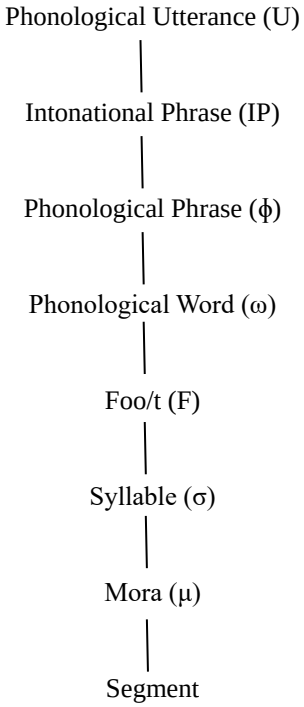
This paper is organized as follows. First, a brief overview of the PW and its place within the prosodic hierarchy is given in Section 2 below. Since stress will be used as a basic diagnostic tool to detect if any changes occur to the stem upon affixation, the stress facts in NA will be presented in Section 3, followed by a preliminary definition of the PW in NA in Section 4. The rest of the paper will be devoted to the analysis and discussion of the various affixes and phonological processes and how they affect the stem thereby reaffirming or otherwise the preliminary definition of the PW in NA.

2. The Phonological Word and the Prosodic Hierarchy

Phonologists recognize that many phonological processes have certain domains for their application. That is, they require reference to units or constituents at various levels within a word. For example, some phonological processes are limited to the domain of the syllable, as in some varieties of Spanish where an alveolar nasal /n/ changes into a velar nasal /ŋ/ when it is in the syllable rhyme, but remains /n/ elsewhere (Harris, 1983; Spencer, 1996). Other phonological processes have larger units or domains for their application such as the foot, the phonological word (also known as the prosodic word), the phonological phrase, etc. These domains form what linguists nowadays recognize as an ascending hierarchy of constituents known as the "prosodic hierarchy", where each constituent is dominated by the next constituent higher up. Although there is no general consensus on the number of constituents (or levels) included in the prosodic hierarchy, the constituents in the prosodic hierarchy shown in (1) below are recognized by most linguists (Selkirk, 1980; Booij, 1983; Roca, 1994).

Others have proposed additional constituents to be added to the hierarchy to account for various phenomena. For instance, although criticized by many linguists, Nespor and Vogel (1986) argued for an additional constituent, known as the "Clitic Group", to be placed immediately above the PW to account for the fact that clitics in some languages do not always participate with the phonological phenomena of the PW. Downing (1999) also proposed another constituent, the phonological stem, which is immediately dominated by the PW, to account for the fact that the phonological stem and PW have different minimality constraints and also different domains for phonological rules.

(1) The Prosodic Hierarchy



2.2 The Phonological Word (PW)

As shown in the prosodic hierarchy in (1) above, the PW is a phonological constituent that dominates the foot, which itself is dominated by the phonological phrase. But what exactly is the PW? The PW is basically a morphological structure, e.g., a stem, which has been mapped onto a phonological structure. It is often described as a string that can be preceded and followed by a pause (Nordquist, 2010). Thus, although the PW consists of at least a morphological stem, the PW and the morphological word (MW) do not necessarily coincide. In English, for example, while the members of a compound form a single MW, e.g., "hot dog", each member of the compound forms its own PW, which is evident by the fact that the phonological properties of a single member do not apply to the other members of the compound (Vogel, 2006).

Evidence that motivates the need for such a constituent stems from the fact that the domain specified by the PW is distinct from the one specified by the MW (Hall, 1999; Vogel, 2006). Furthermore, the PW across languages correctly specifies the domain of many phonological phenomena, both prosodic (e.g., word minimality constraints, syllabification, and word stress) and segmental (e.g., assimilation, phonotactic constraints, etc.). For example, the PW is argued to be the domain for syllabification in Germanic languages such as English (Raffelsiefen, 1999), German (Hall, 1999), Dutch (Booij, 1995), and also in Italian (Peperkamp, 1997) and Korean (Kang, 1992), among others. Also language-specific segmental phonological processes that are less widespread cross-linguistically, but are certainly no less important, also make reference to the PW as their domain. For instance, the domain for glide formation in French (Hannahs, 1995) and vowel harmony in Hungarian (Booij, 1984, Nespor & Vogel, 1986) and

Turkish (Waterson, 1965) is also the PW.

The exact definition of the domain of the PW is not the same in all languages. Cross-linguistically, the minimum domain of the PW is the morphological stem, however, the maximum domain varies from one language to another. This is due to the fact that languages display asymmetries in the inclusion/exclusion of prefixes, suffixes, clitics, and function words into the PW. In many languages, such as Italian, and Indonesian, prefixes are not included in the PW and act as independent constituents (Oostendorp, 1999). Likewise, the PW in Malay and Korean consists of the stem including suffixes, but excluding prefixes (Teoh, 1994; Zaharani, 1998; Han, 1995). Weise (1995) also argues that the PW in German consists of the stem plus a vowel-initial suffix. According to Kabak & Vogel (2001), the PW in Turkish consists of the stem and all suffixes up to what they call "phonological word adjoiners", which are a group of suffixes and clitics that join the PW by adjunction rather than inclusion due to their failure to participate with Turkish stress rules. Finally, Dresher (1994) reports that the PW in Tiberian Hebrew is the stem plus grammatical clitics.

As mentioned earlier, the PW correctly delimits the domain of various phonological phenomena. Conversely, these various phonological phenomena can also determine the domain of the PW itself. One of the most reliable diagnostic tools for determining the domain of the PW is stress (Russel, 1999; Raffelsiefen, 1999). That is, if an affix/clitic participates in the assignment of stress, then this can be taken as evidence that the affix/clitic is included in the PW; otherwise it is excluded from the PW. The domain of other phonological processes can also be taken as further evidence of the PW. Thus, in this study the PW in NA will be essentially determined according to the interaction of affixes with stress, in addition to other phonological processes.

3. Stress Assignment in NA

Stress in NA, as with other Arabic dialects, is quantity sensitive where heavy syllables usually attract stress. While Arabic dialects generally share the same mechanism for stress assignment, there are nevertheless many parametric variations that exist between the different dialects which result in differences in the exact placement of stress in each dialect. Such parametric variations include the notion of extrasyllabicity and extrametricality, and whether geminates occur word-finally, among others.

A number of studies have investigated stress placement in various Arabic dialects. However, Al-Ani's study of stress in Classical Arabic (Al-Ani, 1970) is perhaps one of the earliest and most notable studies. The stress patterns of NA closely resemble that of Classical Arabic, however, there are some minor differences. Thus, the analysis of the stress patterns in NA presented here is generally based on Al-Ani's analysis and it includes a number of modifications to account for the NA data.

Generally speaking, stress in NA is highly predictable as it may fall on one of the last three syllables of a word: the ultimate; the penultimate, or the antepenultimate syllable. Stress may never fall on a pre-antepenultimate syllable, however. Syllables in NA are either light (monomoraic) C(C)v; or heavy (bimoraic or greater) C(C)vC, C(C)vv(C), CvCC. Monosyllabic (bimoraic) words are always stressed (see

the examples in (3) below). As for multisyllabic words, the exact placement of stress depends on the position the heavy syllable(s) it contains, if any. All the stress patterns in NA are captured by the simple rule given in (2a) below where word-final consonants are crucially assumed to be "extrasyllabic" (also known as "extrametrical"). That is, word-final consonants do not contribute to syllable weight and act as if they were invisible to syllabification and the stress assignment rules, a phenomenon that is not uncommon cross-linguistically as long as the segment in question occurs at a designated edge (i.e., left or right) of the domain (Hayes, 1995). This means that in order for a syllable to count as heavy in word-final position, it must contain more segments than in word-internal position. Thus, the heavy syllable C(C)vC is considered light word-finally due to the extrasyllabicity of the final consonant. In contrast the heavy syllables C(C)vv(C) CvCC remain heavy word-finally in spite of the extrasyllabicity of the final consonant because C(C)vv(C) contains a long vowel, whereas CvCC contains an additional final consonant, which escapes extrasyllabicity. The extrasyllabicity of a word-final consonant is invoked by the rule in (2b) (Kenstowicz, 1994), which basically renders a final consonant extrasyllabic (i.e., invisible) before syllabification and stress assignment take place. Throughout this paper, extrasyllabicity is indicated by angled brackets < >, whereas a stressed syllable is indicated by placing the diacritic mark **[´]** above the nucleus of the syllable, i.e., the vowel. Finally, for syllabification purposes, each syllable in a word is placed between parentheses and separated from the other syllables by a dot **[.]**.

(2) a. *Word Stress Assignment (WSA) in NA*
Stress the rightmost heavy syllable if and only if it is one of the word's last three syllables; otherwise stress the antepenultimate syllable (initial syllable in disyllabic words).

b. *Word-Final Consonant Extrasyllabicity (WFCE)*
[+cons] → [+extrasyllabic]/ _____ #

Let us demonstrate how stress is assigned with examples from NA. In disyllabic words where both syllables are heavy, stress falls on the rightmost heavy syllable, as in (4) below. If the disyllabic word consists of just one heavy syllable, then that heavy syllable is stressed regardless of its position because it will always be the rightmost heavy syllable, as in (5) below. If the disyllabic word contains no heavy syllables, then stress falls on the initial syllable, as in (6) below. Likewise, if a trisyllabic word consists of two or more heavy syllables, then again the rightmost heavy syllable is stressed, as in (7) below. Also, if the trisyllabic word contains just one heavy syllable, then that heavy syllable is also stressed regardless of its position because it will always be the rightmost heavy syllable, as in (8) below. If the trisyllabic word contains no heavy syllables, then stress falls on the initial (antepenultimate) syllable, as in (9) below. In quadrisyllabic words or longer containing two or more heavy syllables, stress falls on the rightmost heavy syllable, as in (10) below. However, if the quadrisyllabic word or longer contains just one heavy syllable, then that heavy syllable is stressed if and only if it is one of the last three syllables of the word, as in (11) below. Otherwise, stress falls on the antepenultimate syllable as in (12) below.

(3)	/**bín**<t>/	"girl"	**CV́C**<C>
	/**báa**<b>/	"door"	**CV́v**<C>
	/**ktáa**<b>/	"book"	**CCV́v**<C>
(4)	/(kit)**.(táb)**<t>/	"(I) wrote"	(CvC)**.(CV́C)**<C>
	/(ħaað)**.(ríi)**<n>/	"attendees"	(CvvC)**.(CV́v)**<C>
	/(ʔal)**.(ktáa)**<b>/	"the book"	(CvC)**.(CCV́v)**<C>
(5)	/(**ká**a**).**(ti)<b>/	"writer"	(**CV́v).**(Cv)<C>
	/(ʤa)**.(náa)**<ħ>/	"wing"	(Cv).(**CV́v)**<C>
(6)	/(**dá).**(ra)/	"(he) knew"	(**CV́).**(Cv)
	/(**lí).**(ga)/	"(he) found"	(**CV́).**(Cv)
(7)	/(mak)**.**(ta)**.(báa)**<t>/	"libraries"	(CvC)**.**(Cv)**.(CV́v)**<C>
	/(ʃaa)**.(fát).**(hu)<m>/	"(she) saw them"	(Cvv)**.(CV́C).**(Cv)<C>
(8)	/(ki)**.(táb).**(na)/	"(we) wrote"	(Cv)**.(CV́C).**(Cv)
	/(**mák).**(ta)**.**(ba)/	"library"	(**CV́C).**(Cv)**.**(Cv)
(9)	/(**ʃá).**(ba)**.**(ka)/	"net"	(**CV́).**(Cv)**.**(Cv)
	/(**ʃá).**(ri)**.**(ka)/	"company"	(**CV́).**(Cv)**.**(Cv)
(10)	/(ma)**.**(kaa)**.(tíb).**(ku)<m>/	"your (MASC.) offices"	(Cv)**.**(Cvv)**.(CV́C).**(Cv)<C>
	/(mis)**.**(too)**.**(da)**.(ʕáa).**(tu)**.**(hu)<m>/"their storage rooms"		(CvC)**.**(Cvv)**.**(Cv)**.(CV́v).**(Cv)**.**(Cv)<C>
(11)	/(ʃa)**.**(ri)**.(káa).**(tu)**.**(hu)<m>/	"their companies"	(Cv)**.**(Cv)**.(CV́v).**(Cv)**.**(Cv)<C>
	/(ðˤa)**.(ráb).**(tu)**.**(ku)<m>/	"(I) beat you (PL.)"	(Cv)**.(CV́C).**(Cv)**.**(Cv)<C>
(12)	/(ʔaʃ)**.(ʃá).**(ba)**.**(ka)/	"the net"	(CvC)**.(CV́).**(Cv)**.**(Cv)
	/(ʔaʃ)**.(ʃá).**(ri)**.**(ka)/	"the company"	(CvC)**.(CV́).**(Cv)**.**(Cv)

Having laid out the stress facts in NA, we now turn to affixation processes and examine how they interact with the stress assignment rules. But first a preliminary definition of the domain of the PW in NA is given below.

4. A Working Definition of the Phonological Word

Let us begin with the following very simple definition of the PW in NA:

(13) *The Phonological Word (PW) in NA*

The domain of the PW consists of a morphological stem plus all affixes.

This preliminary definition will be tested in the following section.

5. Affixation

5.1 The Definite Article Prefix /ʔal-/

Adding the definite article prefix /ʔal-/ "the" to disyllabic stems consisting of light syllables results in a stress shift where it regresses from the stem's initial syllable to the prefix itself, as shown by the examples in (14) and (15) below.

(14) a. /ʔal-/ + /**gú**mar/ → [**ʔál**-gumar]$_{PW}$ "the moon"
b. /ʔal-/ + /**wá**lad/ → [**ʔál**-walad]$_{PW}$ "the boy"
c. /ʔal-/ + /**ʤí**bal/ → [**ʔál**-ʤibal]$_{PW}$ "the mountain"
d. /ʔal-/ + /**mú**ṭar/ → [**ʔál**-muṭar]$_{PW}$ "the rain"

(15) a. /ʔal-/ + /**ɣá**da/ → [**ʔál**-ɣada]$_{PW}$ "the lunch"
b. /ʔal-/ + /**ʕá**ʃa/ → [**ʔál**-ʕaʃa]$_{PW}$ "the dinner"
c. /ʔal-/ + /**fáð**a/ → [**ʔál**-faða]$_{PW}$ "the space"
d. /ʔal-/ + /**xá**la/ → [**ʔál**-xala]$_{PW}$ "the desert"

Before attaching the definite article prefix, the PW consists of the bare stem as the domain for stress assignment, which correctly places it on the initial syllable, as dictated by the stress rules. However, the examples in (14) and (15) show that the definite article prefix is incorporated into the PW and the expanded PW becomes the new domain for stress assignment where it is reassigned on the prefix according to the stress rules. The derivations of (14a) and (15a) are given in (16) and (17) below.

(16) Derivation of the words /**gú**mar/ "moon" and /**ʔál**-gumar/ "the moon":

Input:	/gumar/	/ʔal-gumar/
WFCE:	/guma<r>/	/ʔal-guma<r>/
Syllabification:	/(gu)**.**(ma)<r>/	/(ʔal)**.**(gu)**.**(ma)<r>/
WSA:	/**(gú).**(ma)<r>/	/**(ʔál).**(gu)**.**(ma)<r>/
Extrasyllabicity Revocation:	/**gú**mar/	/**ʔál**gumar/
Output:	[**gú**mar]$_{PW}$	[**ʔál**-gumar]$_{PW}$

(17) Derivation of the words /ɣáda/ “lunch” and /ʔál-ɣada/ “the lunch”:

Input:	/ɣada/	/ʔal-ɣada/
WFCE:	N/A	N/A
Syllabification:	/(ɣa)**.**(da)/	/(ʔal)**.**(ɣa)**.**(da)/
WSA:	/(**ɣá**)**.**(da)/	/(**ʔál**)**.**(ɣa)**.**(da)/
Extrasyllabicity Revocation:	N/A	N/A
Output:	[**ɣá**da]$_{PW}$	[**ʔál-**ɣada]$_{PW}$

In (16) above, the final consonant of the disyllabic word /gumar/ is rendered extrasyllabic according to the word-final consonant extrasyllabicity (WFCE) rule, given in (2b) earlier, causing the final syllable to be light. Now, since both syllables are light, stress falls on the initial syllable according to the word stress assignment (WSA) rule given in (2a). Finally, the extrasyllabicity of the final consonant is revoked yielding [**gú**mar]$_{PW}$. However, when the definite article prefix /ʔal-/ is attached, a third syllable is formed. Now the word consists of one heavy syllable followed by two light syllables. According to the WSA rule, stress falls on the rightmost heavy syllable, which in this case is the antepenultimate syllable.

5.2 The Dual Suffix /-een/ and the Sound Plural Suffixes /-iin/, /-aat/

As with the definite article prefixed discussed above, adding the dual suffix /-een/ or the masculine sound plural suffix /-iin/ and its feminine counterpart /-aat/ to words containing an epenthetic vowel or an unstressed vowel results in the deletion of that vowel. Furthermore, stress is reassigned so that it falls on the suffix. Consider the following examples.

(18)	/**ṣá**gar/ + /-een/	→	[ṣagr-**éen**]$_{PW}$	“two falcons”
	/**gí**dir/ + /-een/	→	[gidr-**éen**]$_{PW}$	“two pots”
	/**ná**mil/ + /-aat/	→	[naml-**áat**]$_{PW}$	“ants”
(19)	/**ħáa**ḍir/ + /-iin/	→	[ħaaḍ-**ríin**]$_{PW}$	“attendees (MASC.)”
	/**ħáa**ḍir/ + /-aat/	→	[ħaaḍ-**ráat**]$_{PW}$	“attendees (FEM.)”

The final vowel of the stems in (18) is epenthetic and is deleted upon suffixation of /-een, -aat/. Similarly, the final vowel of the stems in (19) is unstressed and is also deleted upon suffixation of the sound plural suffix /-iin, -aat/. More importantly, attaching these suffixes creates a new domain for the stress rules which reassign stress to the appropriate syllable, i.e., the final syllable. Evidently, these suffixes together with their host form a PW which serves as the domain for stress assignment.

5.3 Subject Affixes

Arabic has a non-concatenative root and pattern morphology where verbs are formed by mapping a consonantal root onto a template, which can be inflected for person, number, and gender by adding prefixes, suffixes, or both (also known as “circumfixes”). In the perfective mode, a triconsonantal root

is mapped onto a CvCvC verb template, whereas in the imperfective mode it is mapped onto a CCvC verb template. Table 1 below shows the paradigms for the triconsonantal root /ktb/ "to write" in the perfective/imperfective modes with subject affixes attached. The placement of stress is also shown.

Table 1. Subject Affixes in NA

Person	Perfective			
	Masculine		Feminine	
	Singular	Plural	Singular	Plural
1st	ki**táb**-t	ki**táb**-na	ki**táb**-t	ki**táb**-na
2nd	ki**táb**-t	ki**táb**-tu	ki**táb**-ti	ki**táb**-tin
3rd	ki**táb**	**ktá**b-aw	**ktá**b-at	**ktá**b-an
	Imperfective			
1st	**ʔá-k**tib	**ná-k**tib	**ʔá-k**tib	**ná-k**tib
2nd	**tá-k**tib	ta-kti**b-úun**	ta-kti**b-íin**	**tá-k**tib-in
3rd	**yá-k**tib	ya-kti**b-úun**	**tá-k**tib	**yá-k**tib-in

Since the third person, masculine, singular perfective form, i.e., /kitab/, has no prefixes or suffixes attached to it, it is generally considered by traditional Arab grammarians to be the base form or citation form. What these examples clearly show is that the domain for the stress assignment rules is the entire PW, which consists of the stem and all the affixes attached to it. For example, according to the stress assignment rules presented earlier, if the word contains one heavy syllable, then that heavy syllable is stressed, e.g., /ki**táb**-t/. If the word contains more than one heavy syllable, then the rightmost heavy syllable is stressed, e.g., /ya-ktib-**úun**/. If the word contains no heavy syllables, then the initial syllable is stressed, e.g., /**ktá**b-an/. The derivations of these words are shown in (20) below.

(20) Derivation of the words /kitáb-t/ "(I) wrote", /ya-ktib-úun/ "(they MASC.) write", and /ktáb-an/ "(they FEM.) wrote":

Input:	/kitabt/	/yaktibuun/	/ktaban/
WFCE:	/kitab<t>/	/yaktibuu<n>/	/ktaba<n>/
Syllabification:	/(ki)**.**(tab)<t>/	/(yak)**.**(ti)**.**(buu)<n>/	/(kta)**.**(ba)<n>/
WSA:	/(ki)**.(táb)**<t>/	/(yak)**.**(ti)**.(búu)**<n>/	/**(ktá).**(ba)<n>/
Extrasyllabicity Revocation:	/ki**tábt**/	/yakti**búu**n/	/**ktá**ban/
Output:	[ki**táb-t**]$_{PW}$	[ya-kti**b-úun**]$_{PW}$	[**ktá**b-an]$_{PW}$

Note also that the first vowel of the stem in the perfective mode is deleted when followed by a vowel-initial suffix, e.g., /ktáb-aw/, /ktáb-at/, and /ktáb-an/.

5.4 Object Affixes

Objects affixes exhibit the same behavior observed in subject affixes. When they are attached to the verb, stress is reassigned so that it falls on the syllable designated by the stress rules. Consider the forms in Table 1 above repeated below in Table 2 with the 3rd person singular masculine object suffix attached, e.g., /kitáb-t-ah/ "I wrote it (MASC.)".

Table 2. 3rd Person Singular Masculine Object Affixes in NA

Person	Perfective			
	Masculine		Feminine	
	Singular	Plural	Singular	Plural
1st	ki**táb**-t-ah	kitab-**náa-h**	ki**táb**-t-ah	kitab-**náa-h**
2nd	ki**táb**-t-ah	kitab-**túu-h**	kitab-**tíi-h**	kitab-**tín**n-ah
3rd	**ktá**b-ah	kta**b-óo-h**	**ktíb**-t-ah	kta**b-án**n-ah
	Imperfective			
1st	**ʔá-k**tib-ah	**ná-k**tib-ah	**ʔá-k**tib-ah	**ná-k**tib-ah
2nd	**tá-k**tib-ah	ta-kti**b-úu**n-ah	ta-kti**b-íin**-ah	ta-kti**b-ín**n-ah
3rd	**yá-k**tib-ah	ya-kti**b-úu**n-ah	**tá-k**tib-ah	ya-kti**b-ín**n-ah

Once again, we observe here that the input domain for the stress assignment rules is the entire string. That is, the stem plus all attached affixes constitute the PW to which the stress rules apply. Compare, for example, the derivations of /ktáb-aw/ "they wrote" with /ktab-óo-h/ "they wrote it".

(21) Derivation of the words /ktáb-aw/ and /ktab-óo-h/

Input:	/ktabaw/	/ktabooh/
WFCE:	/ktaba<w>/	/ktaboo<h>/
Syllabification:	/(kta)**.**(ba)<w>/	/(kta)**.**(boo)<h>/
WSA:	/**(ktá).**(ba)<w>/	/(kta)**.(bóo)**<h>/
Extrasyllabicity Revocation:	/**ktá**baw/	/kta**bóo**h/
Output:	[**ktá**b-aw]$_{PW}$	[kta**b-óo-h**]$_{PW}$

The exact same observation is also attested with all of the other object affixes.

5.5 Possessive Affixes

As with subject and object affixes, possessive affixes have the same effect as they form a PW along with their host, i.e., the stem, which in turn becomes the domain for stress assignment. This is illustrated in Table 3 below using the noun /**mák**tab/ "office". The derivations of /**mák**tab-i/ "my office"

and /mak**táb**-kum/ "your (MASC., PL.) office" are given in (22).

Table 3. Possessive Affixes in NA

Person	Masculine		Feminine	
	Singular	Plural	Singular	Plural
1st	**mák**tab-i	mak**táb**-na	**mák**tab-i	mak**táb**-na
2nd	mak**táb**-k	mak**táb**-kum	mak**táb**-ʦ	mak**táb**-kin
3rd	**mák**tab-ah	mak**táb**-hum	mak**táb**-ha	mak**táb**-hin

(22) Derivation of the words /**mák**tab-i/ and /mak**táb**-kum/:

Input:	/maktabi/	/maktabkum/
Extrasyllabicity:	N/A	/maktabku<m>/
Syllabification:	/(mak)**.**(ta)**.**(bi)/	/(mak)**.**(tab)**.**(ku)<m>/
Stress Assignment:	/**(mák).**(ta)**.**(bi)/	/(mak)**.(táb).**(ku)<m>/
Extrasyllabicity Revocation:	N/A	/mak**táb**kum/
Output:	[**mák**tab-i]$_{PW}$	[mak**táb**-kum]$_{PW}$

5.6 Prepositions

With the exception of /l-/ "to/for", /b-/ "in", and /fi-/ "in", all prepositions in NA satisfy the word minimality requirement, which states that a word must be at least bimoraic. This bimoracity requirement is satisfied by a monosyllabic preposition containing two moras (e.g., /táħt/ "under", /báʕd/ "after") or a disyllabic preposition (e.g., /**ʕá**la/ "on", /**wá**ra/ "behind"). All bimoraic prepositions are freestanding words as they may occur independently by themselves and they also bear stress. Furthermore, they may serve as hosts to which affixes can be attached. For example, in (23a) below the preposition /táħt/ "under" occurs as a freestanding word and unattached to the following noun, whereas in (23b) it serves as the host to the object suffix /-aha/ which replaces the deleted noun.

(23) a. /táħt ʔaṭ-**ṭáa**wla/ "under the table"

b. /**táħ**t-aha/ "under it"

The monomoraic prepositions, on the other hand, are not freestanding words and therefore must join the following word to form a PW to which the stress rules apply. However, like bimoraic prepositions, monomoraic prepositions can also serve as hosts for other affixes, in which case they do bear stress provided they are bimoraic. For example,

(24) a. /fi-/ + /**fá**ðа/ → [**fí**-faðа]$_{PW}$ “in space”
b. /fi-/ + /-ha/ → [**fíi**-ha]$_{PW}$ “in it”

In cases where both the hosting monomoraic preposition along with the suffix attached to it fail to satisfy the word minimality requirement, they both join the preceding word to form a PW, as shown in the examples in (25) below.

(25) a. /**gíi**l-at/ → [**gíi**l-at]$_{PW}$ “(it) was said”
b. /**gíi**l-at/ + /l-na/ → [**gíi**l-at]$_{PW}$ [**lí**-na]$_{PW}$ “(it) was said to us”
c. /**gíi**l-at/ + /l-i/ → [gii**l-át**-l-i]$_{PW}$ “(it) was said to me”

In (25a), the passive verb /giil/ and the object suffix /-at/ join together to form a PW and stress is assigned accordingly. In (25b), the preposition /l-/ and the 1st person plural object suffix /-na/ join together to form a separate PW and stress is assigned accordingly. Note that the vowel /i/ is epenthisized after /l-/ to satisfy the word mimimality requirement. In (25c), however, the preposition /l-/ and the 1st person singular object suffix /-i/ join together but fail to satisfy the word minimality requirement. As a result, they both join the previous word and a PW is established to which the stress rules apply yielding [gii**.lát.**li]$_{PW}$.

5.7 The Case Ending /-in/

Classical Arabic contains three definite/indefinite case markers. The indefinite case markers are the nominative /-un/; the accusative /-an/; and the genitive /-in/. For example,

(26) a. /**ʤáa**ʔa **wá**lad-un qa**síi**r-un/
came boy-(NOM) short-(NOM)
“A short boy came.”
b. /ra**ʔáy**-tu **wá**lad-an qa**síi**r-an/
saw-(I) boy-(ACC) short-(ACC)
“I saw a short boy.”
c. /ma**rár**-tu bi-**wá**lad-in qa**síi**r-in
passed-I by-boy-(GEN) short-(GEN)
“I passed by a short boy.”

These case endings, both definite and indefinite, are lost in virtually all Arabic dialects spoken today except for NA, which still retains the genitive indefinite case marker, though the other two indefinite case markers and all three definite case markers are lost as well. NA is perhaps one of the very few dialects, if not the only one, that still uses the indefinite genitive case marker /-in/ in various syntactic structures. For example,

(27) a. /**fík**rit-in **zée**n-a/
idea-(GEN) good
"a good idea"
b. /**fík**rit-in **zée**nat-in bal**ħéel**/
idea-(GEN) good-(GEN) very
"a very good idea"
c. /**ʔá**na ʕaaz**m-ín**-l-i **wáa**hid/
I invited-(GEN)-for-me one
"I have invited someone"

As with all the other affixes discussed earlier, the indefinite genitive case marker /-in/ integrates with its stem host to form a PW, which in turn becomes the domain for stress assignment, as can be seen in the following examples.

(28) a. /**bín**t/ + /-in/ + /-l/ + /-i/ → [bin**t-ín**-li]$_{PW}$ "a daughter of mine"
b. /**bée**t/ + /-in/ + /-l/ + /-ik/ → [bee**t-ín**-lik]$_{PW}$ "a house of yours"
c. /**ʕáazm**/ + /-in/ + /-l/ + /-i/ → [ʕaaz**m-ín**-li]$_{PW}$ "invited"

5.8 The Negation Marker /ma-/

The last affix to be examined is the negation particle /ma-/ which occurs as a bound morpheme that attaches to the following word to form a PW and consequently become the domain for stress assignment. Consider the examples in (29) below.

(29) a. /ma-/ + /**dá**ra/ → [**má**-dara]$_{PW}$ "(he) didn't know"
b. /ma-/ + /**ríka**ḍ/ → [**má**-rikaḍ]$_{PW}$ "(he) didn't run"

To sum up this section on affixation, I have shown that virtually all affixes in NA are incorporated into the stem to which they attach to form a PW. This is supported by the fact that the entire PW consisting of the stem and all affixes becomes the target domain for stress assignment. In the following section I discuss some phonological assimilatory processes which give further evidence to the proposed definition of the PW in NA.

6. Assimilation Processes

6.1 Emphasis Spread

Arabic contains a set of emphatic consonants, /ṣ – ṭ – ḍ/, whose presence effects neighboring segments in a word in a process known as emphasis spread, which basically involves retracting the tongue root. Thus, emphasis spread is in effect a kind of assimilatory process where segments in a word assimilate

in "backness" to emphatic consonants (McCarthy, 1994). The effect of emphasis is mostly notable in neighboring vowels which are generally backed as a result of emphatic influence. The set of emphatics in NA include /ṣ – ṭ – ð̣/ and the occurrence of any of these consonants in a word results in emphasis spreading to the all the segments in the stem and beyond into any affixes attached as well (Alsuhaibani, 2022). For instance, in (30) below emphasis spreads from the emphatic consonant to all the vowels in the word, including affixes, which is indicated by a dot underneath the letter. However, in (31) emphasis does not spread across word boundaries, indicated by (#), into the preceding word, which strongly indicates that the domain for emphasis spread in NA is the PW, which is the stem plus all affixes.

(30) a. /ʔạṣ-ṣạbbạạb-ạạt/ "the coffee pourers (FEM.)"
b. /tạ-ð̣ụmm-ạh/ "(she) hugs him"

(31) a. /gill # ʔạṣ-ṣạbbạạb-ạạt/ "say the coffee pourers (FEM.)"
b. /gill # tạ-ð̣ụmm-ạh/ "say (she) hugs him"

6.2 /l/ Assimilation of the Definite Article

When the definite article prefix /ʔal-/ "the" is attached to a stem, /l/ assimilates to the first consonant of the stem if it begins with one of the following coronal consonants (known in the Arabic linguistics literature as the "sun letters"): /ʃ, s, ṣ, t, ṭ, ð, ð̣, θ, d, z, n, r/. It remains /l/ elsewhere, i.e., before all the other non-coronal consonants (known as the "moon letters") as shown in Table 4 below.

Table 4. Arabic "Sun" and "Moon" Letters

Sun Letters (assimilation)			Moon Letters (no assimilation)		
Indefinite	Definite	Gloss	Indefinite	Definite	Gloss
ʃáms	ʔaʃ-ʃáms	"the sun"	gúmar	ʔál-gumar	"the moon"
séef	ʔas-séef	"the sword"	báab	ʔal-báab	"the door"
ṣéef	ʔaṣ-ṣéef	"the summer"	fíil	ʔal-fíil	"the elephant"
tíin	ʔat-tíin	"the fig"	múṭar	ʔál-muṭar	"the rain"
ṭíin	ʔaṭ-ṭíin	"the mud"	ʔamíir	ʔal-ʔamíir	"the prince"
ðill	ʔá ð-ðill	"the shame"	wálad	ʔál-walad	"the boy"
ð̣íll	ʔáð̣-ð̣ill	"the shade"	kálb	ʔal-kálb	"the dog"
θóob	ʔaθ-θóob	"the dress"	gídir	ʔál-gidir	"the pot"
dárs	ʔad-dárs	"the lesson"	ʤdáar	ʔal-ʤdáar	"the wall"
zaráaf-a	ʔaz-zaráaf-a	"the giraffe"	yóom	ʔal-yóom	"the day"
núur	ʔan-núur	"the light"	xáatam	ʔal-xáatam	"the ring"

raʔíis	ʔar-raʔíis	“the president”	ɣaríib	ʔal-ɣaríib	“the stranger”
lsáan	ʔal-lsáan	“the tongue”	qurʔáan	ʔal-qurʔáan	“the Quran”
			háram	ʔál-haram	“the pyramid”
			ħáram	ʔál-ħaram	“the campus”
			ʕínab	ʔál-ʕinab	“the grape”

Assimilation of /l/ to the following segment occurs only upon prefixation of the definite article /ʔal-/. It is blocked stem-internally or across words, as shown by the following examples.

(32) No /l/ assimilation word-internally:

a. /sulṭaan/ → *suṭṭaan “sultan”

b. /ʤald/ → *ʤadd “whipping”

(33) No /l/ assimilation across words:

a. /ʕali # ʔakal # tiffaaħa/ → *ʕali ʔakat tiffaaħa “Ali ate an apple.”

b. /ʔaħmad # saʔal # suʔaal/ → *ʔaħmad saʔas suʔaal “Ahmed asked a question.”

These examples clearly show that when the definite article prefix /ʔal-/ attaches to the stem, it is incorporated into the phonological word thereby triggering the application of the assimilation rule provided its conditions are met, i.e., the stem begins with a coronal consonant.

6.3 Voicing Assimilation

The final consonant of the stem in nouns and verbs assimilates in voicing to the initial consonant of subject, object, and possessive suffixes if they share the same place of articulation. That is, the voicing feature of the initial consonant of the suffix spreads regressively to the stem’s final consonant, as shown in the following examples.

(34) a. /rígad + **-t**/ → [rigá**t-t**]$_{PW}$ “(I) slept”

b. /bára**d** + **-t**u/ → [barát**-t**u]$_{PW}$ “(you (PL.)) felt cold”

c. /sára**g** + **-k**/ → [sará**k-k**]$_{PW}$ “(he) robbed you”

a. /wála**d** + **-ʦ**/ → [walá**t-ʦ**]$_{PW}$ “your (FEM.) son”

In contrast, the devoicing of the stem’s final consonant does not occur across words, as shown by the following examples.

(35) a. /rígad # taħt/ → *rígat taħt “(he) slept downstairs”

b. /sárag # kírsi/ → *sárak kírsi “(he) robbed you”

a. /wálad # ʦibíir/ → *wálaʦ ʦibíir “your (FEM.) son”

No voicing assimilation occurs stem-internally either. However, this is due to the fact that the phonotactics of Arabic forbid homorganic consonants that share the same place of articulation from co-occurring immediately next to each other stem-internally (Greenberg, 1950; McCarthy, 1986, 1988, 1994). Thus, ill-formed words such as *madtab and *ʕagkab do not exist as they are ruled out by Arabic well-formedness constraints. What the examples in (35) above clearly show is that environment for final consonant devoicing is the PW, which consists of the stem and the suffix.

7. Conclusion

This paper has presented a detailed analysis of affixation and assimilation processes in NA and examined their effect on the morphological stem in an attempt to give an accurate and precise definition of the domain of the phonological word as a constituent in NA. By using stress placement as a primary diagnostic tool in addition to a number of phonological processes, the preliminary definition of the PW given at the beginning of this paper is confirmed. That is, the PW in NA consists of the morphological stem including all affixes (i.e. prefixes and suffixes, inflectional and derivational) attached to. This conclusion is supported by the fact that the entire morphological word – consisting of the stem and all affixes – constitutes the domain for the stress assignment rules. Thus, in order for a word to be correctly stressed, the stress rules scan and syllabify the entire input word thereby placing stress on the appropriate syllable accordingly.

Furthermore, bimoraic prepositions form their own PW and occur as freestanding, independent words that bear stress. They may also serve as the host for other affixes, in which case the whole string forms a PW. Monomoraic prepositions, on the other hand, never occur as independent words or have stress of their own. As a result, they must attach onto an adjacent word where they both form a PW and stress is assigned accordingly. However, as with bimoraic prepositions, monomoraic prepositions may also be the host for other affixes, in which case they form their own PW and bear stress if and only if they conform to the word minimality constraint. Otherwise they attach to the preceding word and form a PW. Finally, the case suffix /-in/ and the negation prefix /ma-/ also form a PW with the stem to which they attach.

The definition of the PW in NA, which is a Semitic language, is consistent with Dresher's (1994) definition of the PW in Tiberian Hebrew, which is also a Semitic language. According to Dresher, a phonological word in Tiberian Hebrew is "...any word surrounded by spaces. Such words may include grammatical and prosodic clitics. Grammatical clitics are morphemes that obligatorily cliticize onto their host; such clitics may never stand as independent words..." (p. 9). Dresher also explains that "A cliticized word has no main stress of its own, but participates with the word(s) to which it is cliticized in a single phonological word, with one main stress" (p. 9).

The fact that these two closely-related languages share the same definition of the PW suggests that this is also the case with other Arabic dialects, which are certainly more closely-related to NA than Tiberian Hebrew is to NA. However, due to the lack of studies on this particular topic in the Arabic linguistics

literature, this issue remains inconclusive at this point and requires further research on the PW in other Arabic dialects.

References

Al-Ani, S. (1970). *Arabic Phonology: An Acoustical and Physiological Investigation*. The Hague: Mouton. https://doi.org/10.1515/9783110878769

Alsuhaibani, A. (2022). An acoustic study of emphasis spread in Najdi Arabic. *Studies in Linguistics and Literature*, *3*(6), 63-80. https://doi.org/10.22158/sll.v6n3p63

Booij, G. (1983). Principles and parameters in prosodic phonology. *Linguistics*, *1*(21), 249-280. https://doi.org/10.1515/ling.1983.21.1.249

Booij, G. (1983). Neutral vowels and the autosegmental analysis of Hungarian vowel harmony. *Linguistics*, *22*, 629-641. https://doi.org/10.1515/ling.1984.22.5.629

Booij, G. (1995). *The Phonology of Dutch*. Oxford: Clarendon Press.

Downing, L. (1999). Prosodic stem ≠ prosodic word in Bantu. In T. Hall, & U. Kleinhenz (Eds.), *Studies on the Phonological Word: Current Issues in Linguistic Theory* (Vol. 174, pp. 73-98). Amsterdam: John Benjamins. https://doi.org/10.1075/cilt.174.05dow

Dresher, B. (1994). The prosodic basis of the Tiberian Hebrew system of accents. *Language*, *70*(1), 1-52. https://doi.org/10.2307/416739

Greenberg, J. (1950). The patterning of root morphemes in Semitic. *Word*, *2*(6), 162-181. https://doi.org/10.1080/00437956.1950.11659378

Hall, T. (1999). The phonological word: A review. In T. Hall, & U. Kleinhenz (Eds.), *Studies on the Phonological Word: Current Issues in Linguistic Theory* (Vol. 174, pp. 1-22). Amsterdam: John Benjamins. https://doi.org/10.1075/cilt.174

Han, E. (1990). The phonological word in Korean. *Japanese/Korean Linguistics*, *2*, 117-129.

Hannahs, S. (1995). The phonological word in French. *Linguistics*, *6*(33), 1125-1144. https://doi.org/10.1515/ling.1995.33.6.1125

Harris, J. (1994). *English Sound Structure*. Oxford: Blackwell.

Hayes, B. (1995). *Metrical Stress Theory: Principles and Case Studies*. Chicago: University of Chicago Press.

Kabak, B. & Vogel, I. (2001). The phonological word and stress assignment in Turkish. *Phonology*, *18*, 315-360. https://doi.org/10.1017/S0952675701004201

Kang, O. (1992). *Korean Prosodic Phonology*. Doctoral Dissertation. University of Washington.

Kenstowicz, M. (1994). *Phonology in Generative Grammar*. Cambridge, MA: Blackwell.

McCarthy, J. (1986). OCP effect: Gemination and antigemination. *Linguistic Inquiry*, *172*, 207-263.

McCarthy, J. (1988). Feature geometry and independence: A review. *Phonetica*, *43*, 84-108. https://doi.org/10.1159/000261820

McCarthy, J. (1994). The phonetics and phonology of Semitic pharyngeals. In P. Keating (Ed.), *Papers in Laboratory Phonology 3: Phonological Structure and Phonetic Form* (pp. 191-283). Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9780511659461.012

Nespor, M., & Vogel, I (1986). *Prosodic Phonology*. Dordrecht, Foris.

Nordquist, R. (2019, November 4). *What are phonological words*? ThoughtCo. Retrieved from https://www.thoughtco.com/phonological-word-1691507

Oostendorp, M. (1999). Italian s-voicing and the structure of the phonological word. In T. Hall, & U. Kleinhenz (Eds.), *Studies on the Phonological Word: Current Issues in Linguistic Theory* (Vol. 174, pp. 195-212). Amsterdam: John Benjamins. https://doi.org/10.1075/cilt.196.12oos

Peperkamp, S. (1997). *Prosodic Words*. Doctoral Dissertation. University of Amsterdam.

Raffelsiefen, R. (1999). Diagnostics for prosodic words revisited: The case of historically prefixed words in English. In T. Hall, & U. Kleinhenz (Eds.), *Studies on the Phonological Word: Current Issues in Linguistic Theory* (Vol. 174, pp. 133-202). Amsterdam: John Benjamins. https://doi.org/10.1075/cilt.174.07raf

Russel, K. (1999). The "word" in two polysenthetic languages. In T. Hall, & U. Kleinhenz (Eds.), *Studies on the Phonological Word: Current Issues in Linguistic Theory* (Vol. 174, pp. 203-222). Amsterdam: John Benjamins. https://doi.org/10.1075/cilt.174.08rus

Roca, I. (1994). *Generative Phonology*. Routledge.

Selkirk, S. (1980). The role of prosodic categories in English word stress. *Linguistic Inquiry*, *11*, 563-605.

Spencer, A. (1996). *Phonology: Theory and Description*. Oxford: Blackwell.

Teoh, B. (1994). *The Sound System of Malay Revisited*. Kuala Lumpur: Dewan Basha dan Pustaka.

Vogel, I (2006). The phonological word. In R. Asher, & J. Simpson (Eds.), *Encyclopedia of Language and Linguistics* (2nd ed., pp. 531-534). Amsterdam: Elsevier. https://doi.org/10.1016/B0-08-044854-2/00043-2

Waterson, N. (1956). Some aspects of the phonology of the nominal forms of the Turkish word. *Bulletin of the School of Oriental and African Studies*, *3*(18), 81-117. https://doi.org/10.1017/S0041977X00088066

Wiese, R. (1996). *The Phonology of German*. Oxford: Clarendon Press.

Zaharani, A. (1998). *Phonology and Morphology Interface in Malay: An Optimality Theoretic Account* (Doctoral Dissertation). University of Essex.