The Phonological Alternations in the Noun of Instrument (fɪˤɑ:l)

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Abstract

The present paper aims at examining Arabic phonological alternations that occur when deriving the *noun of instrument* with the pattern *fɪˤa:l* from strong and weak trilateral verbs. To this end, the researcher chose 32 *nouns of instrument* from *Al-muˤjam al-wasi:T* (2001) that represent the strong and weak trilateral verbs evenly. The findings of the present study show that the *nouns of instrument* which are derived from strong trilateral verbs undergo systematic alternations since the non-high vowel /ɑ/ after the first radical alternates to the high vowel /ɪ/ and the short vowel after the second radical /ɑ/ corresponds to the long vowel /ɑ:/. *Nouns of instruments* which are derived from weak trilateral verbs can be classified into three classes: class one undergoes a systematic alternation where the non-high vowel /ɑ/

becomes a high vowel /ɪ/ and the short vowel /ɑ/ corresponds to the long vowel /ɑ:/. As for weak verbs, the following phonological processes are motivated: change of the non-high vowel /ɑ/ to a high vowel /ɪ/, ɑ-Assimilation Rule, Lengthening, and Insertion of the glottal stop /ʔ/ at the end of the *noun of instrument* preceded by a long vowel /ɑ:/. Finally, the third class has two phonological changes: the high back rounded sonorant /w/ alternates to the high front unrounded sonorant /j/. After that, the short vowel /ɑ/ is lengthened.

1. Introduction

Nouns in Arabic have different categories according to their morphology and their relationship to Arabic lexical roots. They yield a wide variety of lexical possibilities that contribute to rich Arabic lexicon. Most Arabic nouns are derived from trilateral or quadrilateral lexical roots. Arabic Nouns are derived from lexical roots through the application of certain morphological patterns. Patterns which are interlocked with root phonemes allow the formation of new actual words. These noun patterns carry particular kind of meaning such as the noun of instrument which is used to carry out the action (McCarthy, 1981).

Nouns of instruments (henceforth *NI*) have been introduced by Kufa School[1]. According to the Kufa School, the verb is the origin of derivatives such as derived *NIs,* simply because the human being apprehends the action before the abstract noun; therefore the *root noun* is a derivative. Thus, the *NI* will be considered as a derivative of another noun rather than a derivative of a verb. On the other hand, the Basra school believes that the *root noun* is the origin and the verb is a derivative, simply because the root noun indicates the action without any reference to the time of the action (Ibrahim, 2010:615).

Both of the two schools agree that most of the Arabic lexis have a trilateral root (f ʕ l) which indicates the potential action of all its derivatives. Al-khalil Bin Ahmed used the root (f ʕ l) as a standard pattern or criterion for rhyming in poetry. Arabic morphologists used this norm as a morphological scale to distinguish the different processes that the word form may undergo such as affixation, inflexions, tiers, umlaut and ablaut. Accordingly, every change that occurs in the word form must be adjusted and measured according to the morphological pattern. (Amairah, 2001).

Islam (2010) defines (*ism al-ʕalah*)- the Arabic term for *NI*- as the entity used to enact the base meaning, i.e. the instrument used to conduct an action. As the name suggests, *NIs* are nouns derived from verbs to indicate the name of an instrument of that verb. According to the Arabic Academy in Jordan, *NIs* fit into seven basic patterns arranged chronologically as follow[2]:

1. *Pattern   example   meaning*

  mɪfʕɑl   milqɑt   ' a pincer'

  mɪfʕæ:lɑh   miknæ:sɑh   'a sweeper'

  mɪfʕɑ:l   miftɑ:h   'a key'

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[1]The schools of Kufa and Basra were the first to develop Arabic rules, grammar and syntax. They appeared around late 700 AD (Goodchild, 2003:153).

[2] In this paper the researcher follows the IPA except for the emphatic sounds, which are as follow:

 T: voiceless post-dental emphatic stop.   S: voiceless post-dental sibilant emphatic.

 Z: voiced post-interdental emphatic fricative.   D: voiced post-dental emphatic stop.

faʕʕæ:lɑh	ʁassæ:lɑ	'a washing machine'
fæ:ʕılɑh	na:qılɑh	'a carrier'
fıʕa:l	fıra:ʃ	'mattress'
fɑ:ʕu:l	ħɑ:su:b	'a computer'

This paper is concerned only with the *NI* which has the pattern *fıʕa:l*. This pattern has been recognized by modern linguists in 1962. (Al-(Amairah, 2001:54). What distinguishes this pattern of *NI* from the other ones is the absence of /m/ at the beginning of the pattern (Al-Amairah, 2001:29).

The paper proceeds as follows: Section 1.2 presents some related studies in the field .Section 2 states the objectives of the current study. Section 3 describes the procedures that the researchers follow in conducting this study. Discussion and results are presented in section 4. Section 5 concludes.

2. Literature Review

Al-Amairah (2001) conducts a phono-lexical study on *NIs* .The importance of the study is due to the scientific development and industry that the world is witnessing nowadays. Accordingly, there is always a need to add new patterns for *NIs*. Al-Amairah mentions that there are 116 patterns for *NIs* in classical Arabic .The researcher discusses some of the paradigms of *Nis* and their relations with other derivational classes .The study also examines the *NI* statistically in order to know the iterative numerals for every paradigms. The researcher concludes that some irregular paradigms occur more frequently than some regular ones.

Laks (2015) examines morphological variations and changes in the formation of *NIs* in Hebrew. Non-participle templates always change into participle templates and never the other way around. Nonetheless, not all *NIs* change their templates. The researcher contends that the transition to the participle templates can be predicted based on systematic criteria. Such a change targets both morphological and thematic transparency between the *NIs* and the related verb. The participle *NI* corresponds to a thematic role that the verb assigns. The *NI* has to be agentive in order to be thematically transparent and undergo morphological change. The more transparent the thematic relation between the verb and the *NI* is, the greater the chance for morphological change. Morphologically, the formation of the participle form is also more transparent as it requires fewer changes between the verb and the *NIs*. The only changes that occur are affixation and vowel change of the base verb. The formation in the participle templates preserves the prosodic structure of the base verb. Lak's analysis also provides further support to the stem modification theory and shows that the formation of the *NI* is based on internal changes in the verbal base form.

3. Objective of the Study

In this paper, the researcher investigates the phonological alternations which occur when deriving the Arabic *NI* with the pattern *fıʕa:l* from strong verbs (verbs whose tri-consonantal

root do not include semi-vowels or a vowel sound) and from weak trilateral verbs (verbs whose tri-consonantal roots include a semi-vowel or a vowel sound).To our knowledge, there have been no studies that deal with phonological alternations when deriving the *NI* with the pattern *fiʕa:l*.

4. Methodology

The researcher chose 32 *nouns of instrument* from *Al-*muʕ*jam al-wasi:T* (2001) .These *NIs* have been divided into two groups: *NIs* which are derived from strong trilateral verbs and *NIs* which are derived from weak trilateral verbs in classical Arabic (see the Appendix).

5. Findings and Discussion

Upon examining the data of the *NI* with the pattern *fiʕa:l*, it was found that there are two types of alternation when deriving *NIs* from a strong trilateral root. To make our discussion concrete, let's take the following examples:

2. qatɑr-ɑ   qɪtɑ:r

   'ride a train: PAST-SUBJ'   'a train'

   qanɑʕ-ɑ   qɪnɑ:ʕ

   'wear a mask: PAST-SUBJ'   'a mask'

   fɑrɑʃ-ɑ   fɪrɑ:ʃ

    'put a matress: PAST-SUBJ'   'mattress'

In these *NIs* the vowel /ɑ/ after the first radical alternates to /ɪ/ and the vowel after the second radical /ɑ/ corresponds to /ɑ: /. The rules for these alternations can be summarized as in (3):

3. /ɑ/   / ɪ /

   [-high] − − − − − → **[+high]** $\Big/$ [CVCV:C]$_{IN.}$

   [-long]   [-long]

   [-back]   [-back]

   [-round]   [-round]

4. /ɑ/   /ɑ:/

   [-high] - - - - - - - → [-high] $\Big/$ [CVCV:C]$_{inst\ N.}$

   [-long]   **[+long]**

   [-back]   [-back]

[-round]   [-round]

This indicates that we have a systematic alternation when deriving the *NI* from the strong trilateral root. In other words, the derivation of *NIs* from strong trilateral roots is rule governed.

As indicated before, the derivation of *NIs* from strong trilateral roots is rule governed. The non- high vowel /ɑ/ becomes a high vowel /ɪ/ and vowel /ɑ/ corresponds to the vowel /ɑ:/. More examples include:

5. w**a**k**a**d-ɑ   w**ɪ**k**ɑ:**d

    'wear a belt: PAST-SUBJ'   'a belt'

    s**a**w**a**r-ɑ   s**ɪ**w**ɑ:**r

    'wear a bracelet: PAST-SUBJ'   'a bracelet'

Let's turn now to the second class of *NI* which are derived from weak roots. Consider following examples:
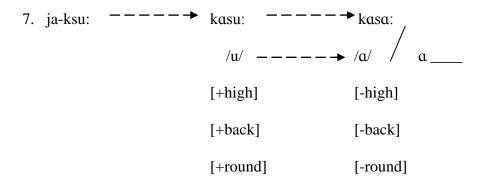
6. kɑsɑ: kɪsɑ:ʔ

    'provide with a costume: PAST-SUBJ'   'a costume'

    lɑwɑ: lɪwɑ:ʔ

    'raise a flag: PAST-SUBJ'   'a flag'

Note that the last radical in these two examples is a vowel since the last long vowel /a: / represents the last root consonant and the SUBJunctive past marker /a/. More importantly, the past PERFective verb /kɑsɑ:/ is derived from the IMPerFective /ja-ksu:/. The last long vowel /u:/ is orthographically written as /w/ in Arabic. Therefore, we assume that a progressive assimilation applies when an IMPF verb turns into a PRF one. In other words, the last vowel /u:/ assimilates to the preceding vowel /a/ as follows:

7. ja-ksu: − − − − − → kɑsu: − − − − − → kɑsɑ:

    /u/ − − − − − → /ɑ/ / ɑ ____

    [+high]   [-high]

    [+back]   [-back]

    [+round]   [-round]

Moreover, we would guess that the *NI* /kɪsɑ:ʔ/ have undergone the following derivation:

8. a. ja-ks-u   IMPF

    b. kɑsɑ-u   PRF

    c. kɪsɑ-u   GERUND

    d. kɪsɑ-ɑ   *a*-Assimilation

    e. kɪsɑ: LENGTHENING

    f. kɪsɑ:ʔ   GLOTTAL EPENTHESIS

First, the IMPF *ja-ks-u* turns into a PRF *kasa-u* by deleting the imperfective prefix *ja,* and adding a vowel /ɑ/ after the first radical. To change the PRF into a GERUND, the first vowel /ɑ/ turns into /ɪ/ as the pattern *fiʕa:l* indicates. A progressive assimilation turns the last vowel /u/, which represents the last radical, into /ɑ/. The two adjacent /ɑ/ vowels become one lengthened /ɑ:/. Finally, to maintain the third radical, we assume that /ʔ/ is inserted after the long vowel /ɑ:/ at the end of the *NI* which has the pattern *fiʕa:l*. The glottal epenthesis is triggered by the need to keep tri-consonantal roots.

10. Ø – – – ➔ [ʔ] / [ɑ: ____ #]$_{IN}$

As for the third class, it is noted that in these *NIs,* the vowel /ɑ/ after the first radical alternates to /ɪ/. In addition, the high back rounded sonorant /w/ is changed to high front unrounded sonorant /j/. This comes as no surprise since both are glides:

11. w – – – ➔ j / ɪ _____

    [+high]   [+high]

    [+round]   [-round]

    [+son]   [+son]

The reason behind such change is the fact that /w/ is preceded by a high front unrounded vowel /ɪ/. Therefore, /w/ *assimilates* to the features of the preceding vowel and hence becomes /j/.[3]

12. rɑwɑʃ-a   rɪyɑ:ʃ   'luxurious dress'

    ʕawɑð-a   ʕɪyɑ:ð   'shelter'

    ʃɑwɑr-a   ʃɪyɑ:r   'a nice dress'

Rules must apply in order: rule 2 must follow rule 1: the change of /ɑ/ into /ɪ/ is a prerequisite for the application of the assimilation rule.

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[3] This Rule was also suggested by Brame (1970).

6. Conclusion

This study shed light on the formation of NI which has the pattern fɪʕɑ:l. When deriving NIs from strong trilateral verbs there are two alternations: the non-high vowel /ɑ/ after the first radical alternates to the high /ɪ/, and the second vowel after the second radical /ɑ/ corresponds to the long vowel /ɑ:/. Accordingly, the derivation of *NIs* from strong trilateral roots is rule governed. On the other hand, *NIs* which are derived from weak trilateral verb can be classified into three classes: class one undergoes a systematic alternation where again the non-high vowel /ɑ/ becomes a high vowel /ɪ/ and the short vowel /ɑ/ corresponds to the long vowel /ɑ:/. As for class two, the following phonological processes are motivated: the non-high vowel /ɑ/ becomes a high vowel /ɪ/, *a*-assimilation rule, lengthening and glottal epenthesis. In the third class, the change of the non-high vowel /ɑ/ into a high vowel /ɪ/ creates a phonological environment for assimilation: /w/ changes to /j/ since it is preceded by the high vowel /ɪ/. Finally, the short vowel /ɑ/ is lengthened to /ɑ:/.

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Appendix

Strong roots

dahan-ɑ	dɪħɑ:n	'paint'
faraʃ-ɑ	fɪrɑ:ʃ	'mattress'
qatar-ɑ	qɪtɑ:r	'train'
qanaʕ-ɑ	qɪnɑ:ʕ	'mask'
ʁaraf-ɑ	ʁɪrɑ:f	'bushels'
laħam-ɑ	lɪħɑ:m	'bridle'
qalaʕ-ɑ	qɪlɑ:ʕ	'sail'
labas-ɑ	lɪbɑ:s	'clothes'
laθam-ɑ	lɪθɑ:m	'cloak veil'
laqaħ-ɑ	lɪqɑ:ħ	'vaccine'
lafaf-ɑ	lɪfɑ:f	'a cloth which is used to wrap the head'
ratad͡ʒ-ɑ	rɪtɑ:d͡ʒ	'door'
ʃaraʕ-ɑ	ʃɪrɑ:ʕ	'sail'
ħatar-ɑ	ħɪtɑ:r	'tire'
salaħ-ɑ	sɪlɑ:ħ	'weapon'
ʕaqal-ɑ	ʕɪqɑ:l	'head band'

Weak Roots

kasɑ:	kɪsɑ:ʔ	'costume'
wakad-ɑ	wɪkɑ:d	'belt'
rawaʃ-ɑ	rɪyɑ:ʃ	'luxurious dress'
safɑ:	sɪfɑ:ʔ	'drug'
sawar-ɑ	sɪwɑ:r	'bracelet '
sawak-ɑ	sɪwɑ:k	'a stick which is used to clean teeth'
ʕawað-ɑ	ʕɪyɑ: ð	'shelter'
lawɑ:	lɪwɑ:ʔ	'flag'
watar-ɑ	wɪtɑ:r	'tendon'
ʃawar-ɑ	ʃɪyɑ:r	'a nice dress'

wɑsɑm-ɑ	wɪsɑ:m	'accolade'
wɑqɑ:	wɪqɑ:ʔ	'a device used to protect people'
wɑkɑd-ɑ	wɪkɑ:d	'a rope used to pull cows'
wad͡ʒad͡ʒ-ɑ	wɪd͡ʒɑ:d͡ʒ	'veil'
wɑsɑd-ɑ	wɪsɑ:dɑh	'cushion'
ʔɑnɑ:	ɪnɑ:ʔ	'container'
ʔɑƟɑr-ɑ	ɪƟɑ:r	'bra'
ʁɑwɑƟ- ɑ	ʁɪƟɑ:ʔ	'any aid device'

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