

Epenthesis in Jerash Fallaahi Dialect: An Autosegmental Analysis

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Abstract:

The study aims to investigate the phonological epenthesis processes which are manifested in Jerash Falla:hi Dialect (JFD), a rural Jordanian dialect spoken in the north of Jordan by almost 130,000 people and has never been investigated before. The study uses a non-linear approach, namely, the autosegmental approach to analyze the phonological epenthesis processes. The data are collected by recording spontaneous conversations of twenty participants of Jerash Falla:hi people who are native speakers of this dialect. The analysis shows that JFD displays two types of epenthesis, namely, vowel epenthesis and consonant epenthesis. Vowel epenthesis involves the insertion of the high short vowel /i/, or the high back vowel /u/, or the short low central vowel /a/ in certain cases within the word boundary or within an adjacent utterance; word-finally and word- medially. The second type is consonant epenthesis, which involves the insertion of the glottal stop /ʔ / within the word boundary. In this type, the glottal stop can only occur word initially.

Keywords: Jerash Fallahi Dialect, phonological processes, autosegmental analysis, vowel epenthesis, consonant epenthesis

1. Introduction

Phonological processes are usually used to represent the way in which certain sounds undergo phonological changes or alternations in specific environments. These changes normally occur when such segments combine to form words (Hall, 2011). One of the major phonological processes that influences the way of pronouncing some groups of segments is known as segment epenthesis or segment insertion. Wolfgang (1984:31) states that “phonological processes serve the communicative function of language by serving their proper functions: pronounceability and perceptibility.”

In the theory of phonology, it is known that epenthesis refers to the process of inserting a vowel or a consonant to avoid creating syllables which are not part of the syllable templates in a certain language or dialect. Hall (2011) points out that the function of the epenthetic vowel or the epenthetic consonant is to repair an input that does not match the structure of a language, or to allow the syllabification of stray consonants. Therefore, epenthesis operates in many languages and dialects to satisfy syllable-based phonotactic constraints.

The purpose of this study is to investigate the epenthesis processes in Jerash fallahi dialect (Henceforth JFD) which has never been studied before, by applying the autosegmental approach. JFD is a rural Jordanian dialect, spoken by almost 130,000 people who live in the province of Jerash in the north of Jordan, nearly 70 miles away from Amman, the capital of Jordan.

1.1. Literature review

There are many studies that dealt with epenthesis in different languages and dialects in the Arab area. However, few of them dealt with the rural 'fallahi' dialects. Irshied (1984) investigates the process of epenthesis in Bani Hassan dialect, which is a Bedouin Jordanian dialect. He indicates that the epenthesis in this dialect depends on the quality of the consonants in the cluster. When the first radical of the cluster word-finally is less sonorant than the second radical in the nominal stem CVCC, epenthesis occurs. Following the Sonorant Hierarchy, from the most sonorant to the least sonorant, epenthesis in Bani Hassan dialect takes place when the cluster consists of an obstruent followed by a sonorant word finally, as in the words /dafn/ [dafɪn] ‘burial’ and /ħarg/ [ħarg] ‘a burn’.

Furthermore, Watson (2002) considers some ways of syllable repair processes in Arabic, such as the epenthesis of a vowel and the prosthesis of a consonant. For example, the vowel /i/ is inserted after the second consonant to avoid having a sequence of three consonants. For instance, in Cairene Arabic the word /ʔ ult + lak/ ‘I told you m. s’ is realized as /ʔ ult[i]lak/, and the word /kull + hum/ ‘all of them’ is realized as /kull[u]hum/. As for the prosthesis of a consonant, she mentions that in some languages as Arabic, all syllables require an onset, and the requirement for a syllable to take an onset is met through prosthesis of a minimal consonant. Therefore, the glottal stop /ʔ / and the high short vowel /i/ are inserted to satisfy this requirement, such as in the words /ʔ il-walad/ ‘the boy’, and /ʔ il-bint/ ‘the girl’.

In another study regarding the epenthesis of the Arabic dialects, Kiparsky (2003), states that the location of the epenthetic vowel differs from one dialect to another. For example, the vowel may occur before C2 or C3 in a medial C1C2C3 cluster. In terms of syllable structure and syllabification patterns, Kiparsky (2003) typologically classifies Arabic dialects into three groups: VC-dialect, CV-dialect, and C-dialect. In the CV-dialects (also known in the literature as ‘onset’ dialects, like Cairene Arabic) the epenthetic vowel is inserted between C2 and C3; in the VC-dialects (also known in the literature as ‘coda’ dialects, like Iraqi) the epenthetic vowel is inserted between C1 and C2 in the C-dialects, no

epenthesis occurs and triconsonantal clusters are realized. Kiparsky (2003) provides the examples below of CV- versus VC-dialects.

- (1) Cairene /ʔul-t-l-u/ [ʔul.ti.lu] 'I said to him'
Iraqi /gil-t-l-a/ [gi.lit.la] 'I said to him'

In analyzing the epenthesis process in Djelfa dialect of Algerian Arabic, Slimani (2017) concludes that word-final C(C)VVCC and C(C)VCCC syllables and word-initial CCC clusters are banned on the grounds that two contiguous semi syllables are not tolerated in the dialect and accordingly, motivate /i/ epenthesis. For instance, when the negative morpheme /ʃ/ is suffixed to words ending in (C)CVVC syllables, it yields phonologically ill-formed structures which are repaired by /i/ insertion, such as the words /ma ʃ a:f-f/ 'he did not see', /ma kla:t-t-ʃ/, 'she did not eat' which are realized as /ma ʃ a:fiʃ/ and /ma kla:tif/, respectively.

In a recent study, Elashhab (2018) studies the epenthesis processes of the dialects of Iraq, Oman, Egypt, and Sudan. The researcher proved that the outputs of epenthesis in Iraqi and Omani are governed by the same constraint, namely the Syllable-Alignment-Left constraint, while in Egyptian and Sudanese the outputs are governed by distinct output constraints, and the predicted conspiracy is not observed. In Omani and Iraqi Arabic, the Syllable-Alignment-Left constraint succeeded in accounting for epenthesis and syncope, since the outputs of epenthesis in these two dialects are governed by the same constraint, fulfilling the prediction of a conspiracy effect. Hence, Omani and Iraqi provide concrete evidence that there is symmetry between epenthesis and syncope since their outputs correspond to each other.

Furthermore, Elashhab (2018) mentions in her study that the purpose of the epenthesis process in the four dialects is to separate the clusters of three consecutive consonants which are hard to pronounce, such as:

- (2) CCC CCVC Egyptian and Sudanese
 CCC CVCC Omani and Iraqi

She provides the following examples from the four dialects to illustrate the epenthesis process. The Omani data are taken from a native speaker of Omani; the informant is a male graduate student. Iraqi data are based on Majdi (1992) and Broselow (1990). The data of Egyptian are based on Davis and Zawaydeh (1997). The Sudanese data are collected from a Sudanese professor in a Libyan university. Elashhab (2018:2)

- (3)
The Omani dialect: CCC CVCC
/tabx+kum/ [ta.bux.kum] 'your cooking (pl)'
/la9b+hum/ [la.9ub.hum] 'their playin'

- The Iraqi dialect: CCC CVCC
/gil+t-la/ [gi.lit.la] 'I said to him'
/bint+na/ [bi.nit.na] 'our daughter'

- The Egyptian dialect: CCC CCVC

/ʔul+t-lu/ [ʔul.ti.lu] 'I said to him'
 /ruħ+t-lak/ [ruħ.ti.lak] 'I went to you'

The Sudanese dialect: CCC CCVC
 /ʔakl+na/ [ʔak.la.na] 'our food'
 /Tefl+ha/ [Tif.la.ha] 'her child'

It is clear that the previous studies show that there are different purposes and different ways of the epenthesis of some sounds in the dialects and languages. For instance, the purpose of the epenthesis process in Iraqi, Omani, Egyptian, and Sudanese dialects is to separate the clusters of three consecutive consonants which are hard to pronounce. On the other hand, in Jordanian Bedouin dialect, epenthesis depends on the quality of the consonants in the cluster, it follows the Sonorant Hierarchy, from the most sonorant to the least sonorant, while in Cairene dialect, the epenthesis of a vowel and the prosthesis of a consonant occurs as a way of syllable repair process.

Therefore, this paper will study the epenthetic sounds in JFD to determine the phonological epenthesis processes which are manifested in this dialect.

1.2. Research questions

The study aims to answer the following questions:

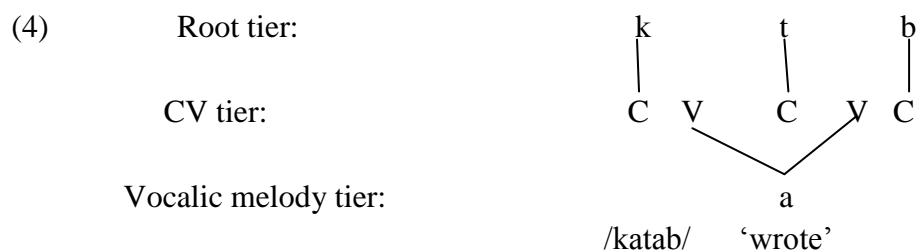
1. What are the phonological epenthesis processes which are manifested in JFD?
2. Are the phonological epenthesis processes obligatory or optional in JFD?
3. Does the autosegmental approach account for getting the appropriate representation of the phonological epenthesis processes or not?

1.3. The autosegmental approach

The autosegmental approach is considered one of the non-linear phonological theories in the field of phonology which focuses on the hierarchical nature of relationships among the phonological units. It posits a richer architecture in that the phonemic representation is described as consisting of two or more tiers of phonological representation. The tiers are linked to each other with association lines in a standard autosegmental way. For instance, the syllable, the stress, the phonological processes, and the distinctive features are organized in a well-established internal hierarchical order (McCarthy, 1979/1982).

The autosegmental approach was first proposed by Goldsmith (1976). He proposes a solution to the problem of tone in the African Languages by representing the underlying phonological representation as a multi-tiered rather than as a linear string of segments. He reveals that tones are given an autonomous representation from the rest of the segments so that regular segments would be presented at one level, and tones would be at another level where the two levels of representation are being synchronized via association lines. A significant modification came in John McCarthy's (1979a, b and 1980) work on Arabic. He proposes a solution for representing Arabic verbs since they are structured around a root consisting of consonants only. McCarthy (1979a) formalizes a theory which he termed the prosodic theory of nonconcatenative morphology to account for getting a correct analysis of the different binyanim 'ʔwza:n', 'measures' in Arabic. The theory is based on that consonants and vowels of Arabic words belong to separate morphologically defined tiers. McCarthy (1979 a) presents an

important development by showing that the derivation of words from consonantal roots in Arabic could be analyzed autosegmentally. He indicates that representing verbs in Arabic is done on three tiers: the root tier, the skeletal tier or the CV tier, and the vocalic melody tier. For example, the tri-consonantal verbal root /ktb/ is analyzed as follows, where association lines are drawn between the tiers:



Accordingly, due to the importance of the autosegmental approach and its benefits in dealing with the major phonological issues, McCarthy's (1991) model of the autosegmental approach will be applied to represent the epenthesis processes in JFD.

2. Method

2.1. Sample /participants

The participants of the study were twenty persons (10 females and 10 males). These twenty participants were purposely selected as sample for this study to represent the various demographic factors such as gender, age, marital status, level of education, and occupation. The following table summarizes the demographic distribution of the study's participants:

Table (1): The Demographic Distribution of the Study's participants in Jerash

Subjects	Gender	Age	Marital status	Education	Occupation
1	female	30	Married	Graduate	civil servant
2	male	52	Married	no formal education	retired soldier
3	female	47	Married	primary school	house wife
4	male	55	Married	primary school	farmer
5	male	28	Unmarried	Graduate	teacher
6	female	62	Married	no formal education	house wife
7	male	35	Married	Graduate	teacher
8	male	63	Married	Graduate	retired civil servant
9	female	40	Married	secondary school	unemployed
10	male	58	Married	no formal education	farmer
11	male	23	Unmarried	Graduate	unemployed
12	female	50	Married	Diploma	civil servant
13	male	67	Married	no formal education	former farmer
14	female	60	Married	no formal education	house wife
15	female	25	Unmarried	Graduate	unemployed
16	male	45	Married	Diploma	tour guide
17	female	55	Married	Graduate	retired teacher
18	female	53	Divorced	no formal education	house wife
19	female	37	Married	Graduate	civil servant
20	male	54	Married	primary school	Farmer

2.2. Data collection

To investigate the types of epenthesis in JFD, the researcher collects data from recordings of conversations and dialogues from the twenty participants of Jerash Falla:hi people who are native speakers of this dialect. This source is obtained by the researcher herself. Given that the nature of this study is a descriptive and a qualitative one, the purposive sampling technique is, thus the most appropriate one because it gives the researcher the needed control on her sample to meet the nature and the objective of the study.

The data from these participants were collected during the period from August 2017 until October 2017. A sophisticated mobile phone was used in the process of recordings in order to clearly capture the phonological epenthesis processes of the speakers through their speech. The participants' spontaneous conversations were recorded during either family meetings or individual meetings, allowing them to talk freely about various topics. Then, the conversations were transcribed by using the International Phonetic Alphabet (IPA) transcription in a clear and natural way and the words that displayed the phonological epenthesis processes were isolated and analyzed in regard to their types.

3. Results

The analysis of the recordings shows that epenthesis in JFD is considered one of the repair strategies to create a syllable according to the syllable template of the language. It occurs whenever violations of language universal, or certain principles take place. Furthermore, the data identifies two types of epenthesis, namely, vowel epenthesis and consonant epenthesis. Vowel epenthesis involves the insertion of the high short vowel /i/, or the high back vowel /u/, or the short low central vowel /a/ in certain cases: word-finally and word- medially. The second type is consonant epenthesis which involves the insertion of the glottal stop /ʔ/. However, in this case, the glottal stop can only occur word initially. The following sections will provide adequate data to illustrate the two types of epenthesis clearly.

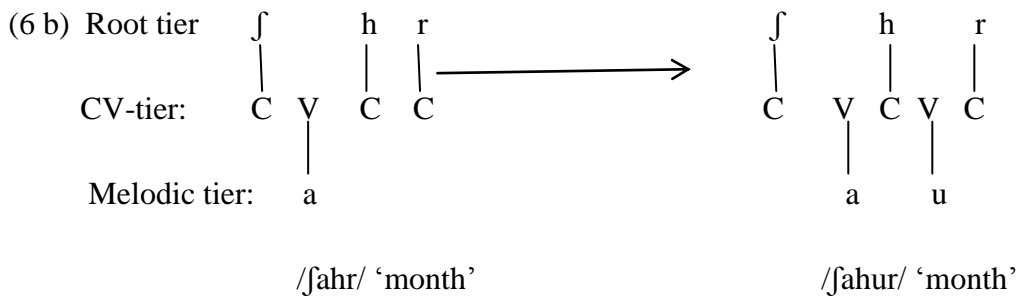
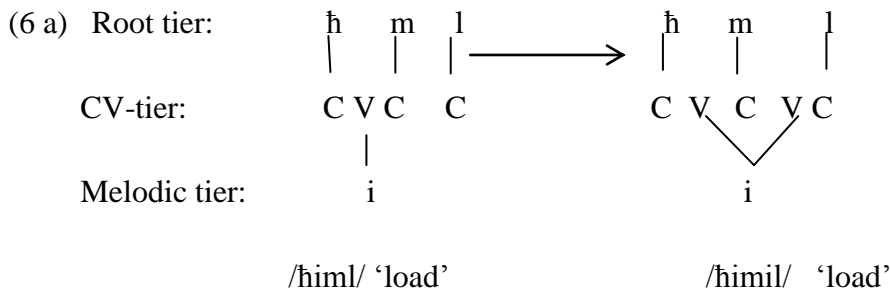
3.1. Vowel epenthesis

Vowel epenthesis in JFD takes place in several ways: First, the high short vowel /i/, or the high back vowel /u/, is prepausally inserted in the CVCC nominal stems to break up the impermissible consonant cluster word-finally. Thus, these forms surface as CVCVC structure, as shown in data (5):

(5)	/tibn/	[tibin]	‘hay’	/fahɾ/	[fahur]	‘month’
	/sihr/	[sihir]	‘magic’	/baɣl/	[baɣul]	‘mule’
	/Sagr/	[Sagur]	‘falcon’	/baħr/	[baħur]	‘sea’
	/sidʒn/	[sidʒin]	‘prison’	/ħiml/	[ħimil]	‘load’
	/ħumr/	[ħumur]	‘red ones’	/ʃuɣl/	[ʃuɣul]	‘work’

The data in (5) show that the vowels are inserted obligatorily with the CVCC nominal stems in the dialect, and thus, they surface as CVCVC. This obligatory insertion of the vowels occurs to break up the consonant clusters word-finally to avoid the violation of the Sonority Sequencing Principle (SSP) (see Katamba, 1989:104).

In terms of the autosegmental approach, the process of vowel epenthesis in the words /ħimil/ ‘load’ and /fahur/ ‘month’ is represented as follows:



However, the study also shows that in JFD these epenthetic vowels can occur optionally with the same form of the CVCC structure and surface either as CVCVC or as CVCC. This is evident in data (7 a) and (7b), respectively:

(7 a)	/dars/	[daris] ~ [dars]	‘lesson’
	/ħilm/	[ħilim] ~ [ħilm]	‘dream’
	/dʒamʕ/	[dʒamiʕ] ~ [dʒamʕ]	‘collecting’
	/ħarg/	[ħarig] ~ [ħarg]	‘a burn’
	/nifT/	[nifiT] ~ [nifT]	‘petrol’
	/kinz/	[kiniz] ~ [kinz]	‘treasure’
	/sumk/	[sumuk] ~ [sumk]	‘thickness’
	/dʒurħ/	[dʒuruħ] ~ [dʒurħ]	‘wound’
	/xurdʒ/	[xurudʒ] ~ [xurdʒ]	‘a pouch put on the back of a horse or a donkey’

(7 b)	/kabd/	[kabid] ~ [kabd]	‘liver’
	/nafʃ/	[nafis] ~ [nafʃ]	‘self’
	/nasx/	[nasix] ~ [nasx]	‘copying’
	/ʕabd/	[ʕabid] ~ [ʕabd]	‘slave’
	/xasf/	[xasif] ~ [xasf]	‘lessening’
	/nasf/	[nasif] ~ [nasf]	‘blasting’
	/nafʃ/	[nafij] ~ [nafʃ]	‘ruffle’

Although the data in (7 a) and (7 b) have the same structure as the data in (5), it has two possible outputs. The data in (7 a) show that the vowel insertion applies optionally, even if the leftmost consonant in the final consonant cluster is less sonorous than the rightmost one. The data in (7 b) also show that the vowel insertion applies optionally, even if the two consonants of a consonant cluster have the same degree of sonority. An interpretation to the optionality of vowel insertion in this case is referred to the SSP, which is responsible for the organization of the syllable structure. Hence, it is

clear that vowel epenthesis in JFD applies obligatorily whenever a final –CC cluster violates the SSP and optionally otherwise. In this regard, Sakarna (1999) indicates that in ʕabba:dy dialect, the epenthetic vowel in the CVCC form between the consonant clusters is the low short vowel /a/ not the high vowels /i/ and /u/. For instance, the words /taxt/ ‘bed’, and /baxt/ ‘luck’ are realized as / taxat/, and / baxat/ in ʕabba:dy dialect, while they are realized as /taxit/, and /baxit/ in JFD. In regard to verbs, JFD does not have the form of CVCC as a verb. Thus, the vowel epenthetic rule cannot apply to the verbs in the dialect.

The second case of vowel epenthesis in JFD is the medial epenthesis of the vowels /u/ or /i/ within two adjacent words in the same utterance. Brame (1973) indicates that the verb and the subject suffix in MSA form constitute one lexical constituent. Thus, when suffixes are put with stems to form phrases, or when words are put together into sentences, three or four consonant clusters may arise phrase internally or across the word boundary. Such clusters are not allowed in several Arabic dialects, including JFD. Hence, a vowel is inserted between the first and the second consonants in the three consonant clusters to produce well-formed syllable structures in the dialect. Consider the following data:

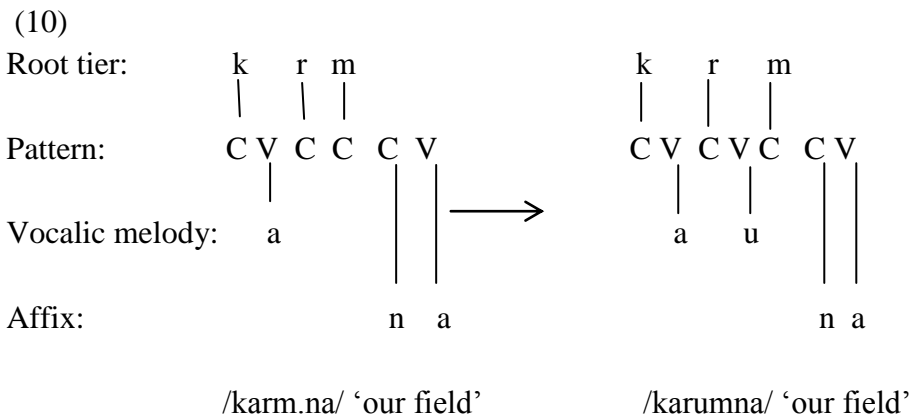
(8)	/bint xa:li/	[binitxa:li]	‘the daughter of my uncle’
	/nimt baki:r/	[nimitbaki:r]	‘I slept early’
	/ħuzn ʃadi:d/	[ħuzunʃadi:d]	‘extreme sadness’
	/nifT xali:dʒi/	[nifiTxali:dʒi]	‘Gulf oil’
	/gult lu/	[gulutlu]	‘I told him’

It is worth mentioning that in the words /bint/ ‘girl’, /nimt/ ‘I slept’, and /gult/ ‘I said’, the insertion of the vowels in JFD is optional since there is no violation of the (SSP). However, when they are followed by another word that starts with a consonant, the vowel insertion becomes obligatory because they form tri-consonantal clusters.

In addition, words which are followed by suffixes that start with a consonant segment, apply the same process. By contrast, words followed by suffixes that start with a vowel segment, are not affected by this process because they do not form tri-consonantal clusters. Compare the data in (9 a) and the data in (9 b) below:

(9 a)	/karm-na/	[karumna]	‘our field’ 1st, pl.
	/karm -ha/	[karumha]	‘her field’ 3rd, sg., f.
	/karm -ku/	[karumku]	‘your field’ 2nd, pl./du., ms.
	/karm -ʃen/	[karumʃen]	‘your field’ 2nd, pl./du., f.
	/karm.hum/	[karumhum]	‘their field’ 3rd, pl./du., ms.
	/karm -hen/	[karumhen]	‘their field’ 3rd, p i/d u ., f.
	/karm -ha/	[karumha]	‘her field’ 3rd, sg. f.
(9 b)	/karm -u/	[karmu]	‘his field’ 3rd, sg., ms.
	/karm - ak/	[karmak]	‘your field’ 2nd, sg. ms.
	/karm - iʃ/	[karmiʃ]	‘your field’ 2nd, sg. f.

In terms of the autosegmental approach, the word /karm.na/ ‘our field’ which is realized as /karumna/ ‘our field’ is represented as follows:



The third case of vowel epenthesis in JFD is also a medial epenthesis of the vowels /u/, /i/, or /a/ when there are CCCC clusters across word boundary within the same utterance. In this case, the process of epenthesis can occur by inserting two vowels. The first vowel is inserted between the first two consonants and the second vowel is inserted between the second two consonants, as shown in data (11):

- | | | |
|-------------------|---------------|-------------------|
| (11) /karm Sʁi:r/ | /karumSʁi:r/ | ‘a small field’ |
| /nifT kθi:r/ | /nifiTkiθi:r/ | ‘a lot of petrol’ |
| /ħarg kbi:r/ | /ħarugkabi:r/ | ‘a big burn’ |

The data in (8, 9a and 11) show that JFD does not tolerate CCC or CCCC clusters. Thus, a medial vowel is inserted between the first and the second consonants in the case of three consonant clusters, while in the case of four consonants, two vowels are inserted in the word; the first one is inserted between the first two consonants and the second one is inserted between the second two consonants. i.e. the epenthetic vowels occur to break up the tri-consonantal clusters in (8) and (9 a), and to break up the quadri-consonantal clusters in (11). Regarding the kind of the inserted vowels in the epenthetic process in the dialect, the data show that it depends on the quality of the stem vowel in the word. For instance, when the stem vowel in the word is /i/, it is obligatory that the epenthetic vowel will be /i/, and when the stem vowel is /u/, the epenthetic vowel will be /u/. Consider the following data in (12 a) and (12 b):

- | | | | |
|--------|---------|----------|------------|
| (12 a) | /ʃitf/ | [ʃitif] | ‘shoulder’ |
| | /Simʁ/ | [Simiʁ] | ‘glue’ |
| | /siħr/ | [siħir] | ‘magic’ |
| | /ħiml/ | [ħimil] | ‘load’ |
| | /tibn/ | [tibin] | ‘hay’ |
| | /bint/ | [binit] | ‘girl’ |
| | /ʃilm/ | [ʃilim] | ‘science’ |
| | /silm/ | [silim] | ‘peace’ |
| | /sidʒn/ | [sidʒin] | ‘prison’ |
| | /dʒism/ | [dʒisim] | ‘body’ |

(12 b)	/ʃuɐl/	[ʃuɐul]	‘work’
	/ʃumr/	[ʃumur]	‘age’
	/dʒurħ/	[dʒuruħ]	‘wound’
	/xubz/	[xubuz]	‘bread’
	/kuSn/	[kuSun]	‘branch’
	/furn/	[furun]	‘oven’
	/ħukm/	[ħukum]	‘judgment’
	/rudʒm/	[rudʒum]	‘scree of stones’
	/xurdʒ/	[xurudʒ]	‘a bag put on the back of a donkey or a horse’

The process of epenthesis that is seen in data (12 a) and (12 b) is referred to as a regressive vowel harmony, which is active among the speakers in the dialect. On the other hand, when the stem vowel in the word is the low short central vowel /a/, the epenthetic vowel alternates between the /u/ and the /i/ vowels. The epenthesis of the /u/ vowel can be explained in terms of their agreement in the backness feature, while the epenthesis of the /i/ vowel can be explained by the agreement in the feature unrounded. As data (13) show:

(13)	/Sagr/	[Sagur]	‘falcon’
	/galb/	[galub]	‘heart’
	/ħarf/	[ħaruf]	‘letter’
	/sagf /	[saguf]	‘ceiling’
	/baɪl/	[baɪul]	‘mule’
	/taxt/	[taxit]	‘bed’
	/baxt/	[baxit]	‘luck’
	/naħt/	[naħit]	‘curving’

3.2. Consonant epenthesis

Consonant epenthesis in JFD involves the insertion of the glottal stop /ʔ/ word- initially, followed by the /i/ or the /u/ vowels. In this case, there are four situations: First, JFD as one of the Jordanian dialects requires syllables to form onsets because it does not allow onsetless syllables. Hence, the glottal stop /ʔ/ is inserted to be the onset of the first syllable in measure I imperative verbs, then the high short vowel /i/ or the high back round vowel /u/ are inserted to be the nucleus of this syllable. Measure I imperative verbs have the canonical shape CCVC. Consider the following examples in (14):

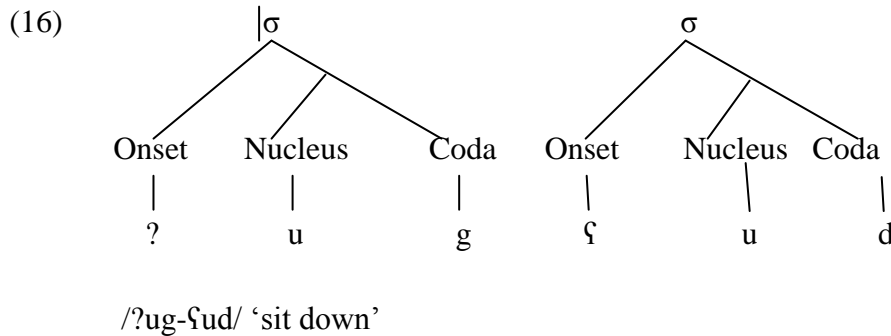
Measure I imperative verbs

(14)	/ktub/	‘write’	/drus/	‘study’
	/ʃrab/	‘drink’	/ftaħ/	‘open’
	/gʃud/	‘sit down’	/rmi/	‘throw’

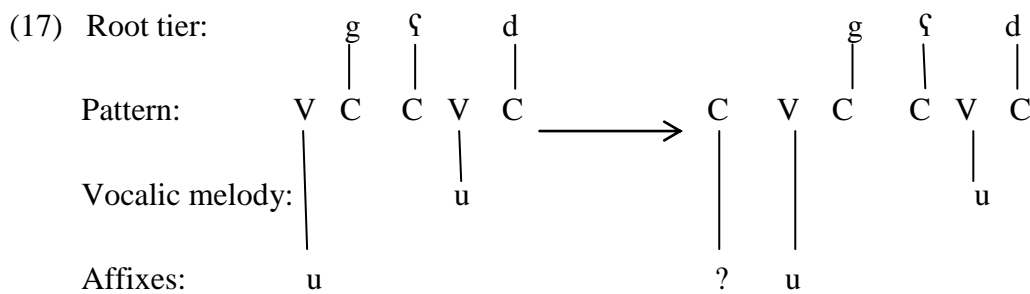
However, these forms are not used by JFD speakers. Instead, the second person singular masculine forms are used by adding the vowels /u/ or /i/ as a prefix to the stem, creating onsetless syllables word-initially. Thus, to remedy this violation of the syllable structure, the glottal stop /ʔ/ is inserted, producing the following forms with well- formed syllables, as in (15):

- (15) /u-ktub/ : /ʔuk-tub/ ‘write’ /i-ʃrab/ : /ʔiʃ-rab/ ‘drink’
 /u-drus/ : /ʔud-rus/ ‘study’ /i-ftaħ/ : /ʔif-taħ/ ‘open’
 /uɡʃud/ : /ʔuɡ-ʃud/ ‘sit down’ /i-rmi/ : /ʔir-mi/ ‘throw’

The well-formed syllable structure of the imperative verb /ʔuɡ-ʃud/ ‘sit down’ is represented as follows:



In terms of the autosegmental approach, the imperative verb /u-ɡʃud/ ‘sit down’, which is realized as /ʔuɡ-ʃud/, is represented as follows:

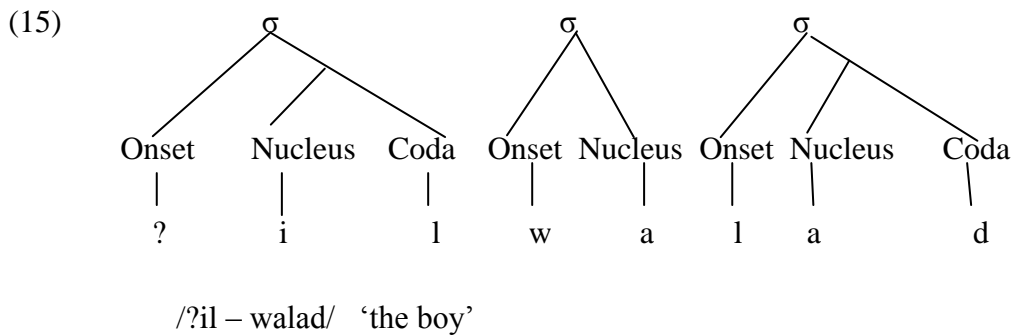


/u-ɡʃud/ ‘sit down’ (an onsetless syllable) /ʔuɡ-ʃud/ ‘sit down’ (an onset syllable)

As for the quality of the prosthetic vowel in this type of epenthesis, it depends on the quality of the vowel in the stem. If the vowel in the stem is /u/, the epenthetic vowel is /u/, such as the verb /ktub/ ‘write’, which is realized as /ʔuk-tub/, and the verb /drus/ ‘study’, which is realized as /ʔud-rus/. This phenomenon also occurs due to a regressive vowel harmony process, which is active in JFD, as mentioned earlier. However, if the vowel in the stem is /a/ or /i/, the epenthetic vowel in both cases is the vowel /i/ because the feature unrounded, in which these vowels share, can play a major role in this process. For example, the verb /ftaħ/ ‘open’, and the verb /rmi/ ‘throw’ are realized as /ʔif-taħ/, and /ʔir-mi/, respectively.

The second case of the glottal stop insertion occurs with few common vowel-initial morphemes in the dialect which may occur in an utterance in the initial position, such as, the definite article /l/, the relative pronouns, as /ili/ ‘for me’ and /illak/ ‘for you’, and the first and the second independent pronouns, as /ani/ ‘I’, /inti/ ‘you. fem’, and /inta/ ‘you. mas’. When these morphemes occur in an utterance initial- position, the requirement for a syllable to take an onset is met through the glottal stop

insertion. Thus, the epenthesis of the glottal stop in the word /il-walad/ ‘the boy’ is realized as /ʔil-walad/ and is represented as follows:



The third case of the consonant epenthesis in JFD is the insertion of the glottal stop and the high front vowel /i/ at the beginning of the nominals that start with an onset with two clusters. Although several studies indicate that all Jordanian dialects allow two consonant clusters word- initially (Al-ghazo, 1987; Al-Sughayer, 1990; Sakarna, 1999; Abo- Abbas, 2003; Rakheih ,2008, and Mashaqba 2015, among others), the collected data from JFD show that the glottal stop and the high short front vowel /i/ are inserted in front of these two clusters in their onset. The data also show that the insertion of the glottal stop and the vowel /i/ applies obligatorily with adjectives that denote colors and defects; meanwhile, they apply optionally with nouns. Consider the data in (16 a) and (16 b):

- (16 a)
- | | | | | | | | |
|---------|---|-----------|------------|---------|---|------------|----------|
| /ħmar/ | : | /ʔih-mar/ | ‘red’ | /Sfarr/ | : | /ʔiS-far/ | ‘yellow’ |
| /xDarr/ | : | /ʔix-Dar/ | ‘green’ | /zragg/ | : | /ʔiz-rag/ | ‘blue’ |
| /swad/ | : | /ʔis-wad/ | ‘black’ | /byaD/ | : | /ʔib-yaD/ | ‘white’ |
| /ʕwar/ | : | /ʔiʕ-war/ | ‘eyeless’ | /xwaθ/ | : | /ʔix-waθ/ | ‘fool’ |
| /Traʃ/ | : | /ʔiT-raʃ/ | ‘deaf’ | /ʕma/ | : | /iʕ-ma/ | ‘blind’ |
| /xras/ | : | /ʔix-ras/ | ‘muteness’ | /ʕradʒ/ | : | /ʔiʕ-radʒ/ | ‘lame’ |
| /hbal/ | : | /ʔih-bal/ | ‘fool’ | /dʒrab/ | : | /ʔidʒ-rab/ | ‘dirty’ |
- (16 b)
- | | | | |
|----------|---|-------------|--|
| /ʕma:m/ | ~ | /ʔiʕ-ma:m/ | ‘uncles’ (brothers of the father) |
| /xwa:l/ | ~ | /ʔix-wa:l/ | ‘uncles’ (brothers of the mother) |
| /ʕnib/ | ~ | /ʔiʕ-nib/ | ‘grapes’ |
| /ʕla:m/ | ~ | /ʔiʕ-la:m/ | ‘flags’ |
| /sla:k/ | ~ | /ʔis-la:k/ | ‘wires’ |
| /sla:l/ | ~ | /ʔis-la:l/ | ‘baskets’ |
| /mʃa:T/ | ~ | /ʔim-ʃa:T/ | ‘combs’ |
| /ʃla:b/ | ~ | /ʔiʃ-la:b/ | ‘dogs’ |
| /gna:b/ | ~ | /ʔig-na:b/ | ‘trimming’ |
| /dʒba:l/ | ~ | /ʔidʒ-ba:l/ | ‘mountains’ |
| /kma:dʒ/ | ~ | /ʔik-ma:dʒ/ | ‘a type of bread’ |
| /mru:dʒ/ | ~ | /ʔim-ru:dʒ/ | ‘meadows’ |
| /rda:n/ | ~ | /ʔir-da:n/ | ‘sleeves’ |
| /ʃra:k/ | ~ | /ʔiʃ-ra:k/ | ‘a kind of bread’ |
| /ʃra:ʕ/ | ~ | /ʔiʃ-ra:ʕ/ | ‘a container made of cow’s skin for keeping yoghurt’ |

4. Results and conclusions

This study presents the phonological epenthesis processes in JFD using the autosegmental approach. The data identifies two types of epenthesis, the insertion of the vowel, and the insertion of the consonant. The insertion of the vowel involves the insertion of the high short vowels /i/, /u/, or /a/ word-finally and word- medially. The second type is the consonant insertion, which involves the insertion of the glottal stop /ʔ/ word initially.

Regarding vowel epenthesis, the study displays three ways of inserting the short vowels: First, the short vowels /i/, or /u/ are inserted in the CVCC nominal stems to break up the impermissible consonant cluster word-finally, presenting the CVCVC form. In this case the insertion of the vowels occurs obligatorily to break up the consonant clusters word-finally to avoid the violation of the Sonority Sequencing Principle (SSP), however, the insertion of the vowels is optional when there is no violation of the (SSP).

The second case is the medial epenthesis of the vowels /u/ or /i/ within two adjacent words in the same utterance. In JFD, when the words are attached to suffixes to form phrases, three or four clusters may arise phrase internally or across the word boundary. Such clusters are not allowed in the dialect. Therefore, a vowel is inserted between the first and the second consonants in the three consonant clusters to produce well-formed syllable structures. The third case of vowel epenthesis is also a medial epenthesis of the vowels /u/, /i/, or /a/ when there are CCCC clusters across word boundary within the same utterance. In these cases, the process of epenthesis is considered obligatory to avoid syllables with tri and quadri consonantal verbs and this can occur by inserting two vowels; the first vowel is inserted between the first two consonants and the second vowel is inserted between the second two consonants.

On the other hand, consonant epenthesis involves the insertion of the glottal stop /ʔ / word- initially, followed by the vowels /i/ or /u/. In this case, there are four situations: First, the glottal stop /ʔ / is inserted with the vowels /i/ or /u/ to the onset with measure I imperative verbs which have the canonical shape CCVC. Secondly, the glottal stop is inserted with few common vowel-initial morphemes in the dialect, which may occur in an utterance in the initial position. Thirdly, the glottal stop and the high front vowel /i/ are inserted at the beginning of the nominals that start with an onset with two clusters. The data show that the insertion of the glottal stop and the vowel applies obligatorily with adjectives that denote colors and defects; by contrast, they apply optionally with nouns. Finally, the glottal stop is inserted in the passive form with the tri-consonantal and the quadri-consonantal verbs in the perfective form.

Finally, the study shows that applying the autosegmental approach in representing the phonological epenthesis processes is an appropriate and adequate way to clarify these processes clearly.

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The transcription system used in this article

1. The transcription system used to represent the consonants in this article is the International Phonetic Alphabet (IPA) except for the following:

[h]: The voiceless pharyngeal fricative.

[T]: The emphatic counterpart of the plain /t/.

[S]: The emphatic counterpart of the plain /s/.

[D]: The emphatic counterpart of the plain /ð/.

[L]: the emphatic counterpart of the plain /l/.

[R]: The emphatic counterpart of the plain /r/.

2. IPA Symbols for vowels:

Description	IPA Symbols
Short low central unrounded	a
Long low central unrounded	a:
Short high back rounded	u
Long high back rounded	u:
Short high front unrounded	i
Long high front unrounded	i:
Short mid front unrounded	e
Long mid front unrounded	e:
Short mid back rounded	o
Long mid back rounded	o: