International Journal of Innovation and Applied Studies
ISSN 2028-9324 Vol. 9 No. 2 Nov. 2014, pp. 819-828

http://www.ijias.issr-journals.org/

Constraints on Tunisian Arabic Epenthesis

Mounir Jouini

Higher Institute of Languages of Nabeul
University of Carthage
Tunisia

ABSTRACT: The aim of this paper is twofold. First, it studies the epenthesis of [ɪ] in Tunisian Arabic (TA) in different environments (C+CC and V:C+C), where it focuses on the way the exact site of the epenthetic vowel is determined (e.g. C+CC > CvCC rather than CCvC). It shows that the reason why a CCC cluster is broken into CvCC rather than CCvC owes to the preference of TA to violate juncture contiguity instead of domain contiguity. This discussion is fully set within Optimality Theory and related sub-theories such as Generalized Alignment and Correspondence Theory. Second, the paper argues that the syllable formed by the epenthetic vowel (CvC) should be added to the TA syllable inventory as a separate syllable type. The evidence comes from stress assignment and shows that the syllable, despite its having a CVC shape, has to be considered as light. This subsequent discussion is set within moraic theory and adopts the technique of mora-sharing in order to satisfy both requirements of monomoraic weight and coda moraicity following the principle of Weight-by-Position. By doing so, it solves the long-standing problem of how to interpret the stress shift in derivatives such as [ˈtik.tib] (*you write*) and [tik.ˈtib] (*it was written*).

KEYWORDS: Epenthesis site, Relativized Contiguity, mora-sharing, new TA syllable type, stress shift.

1 INTRODUCTION

Within the Theory of Constraints and Repair Strategies [1], epenthesis is interpreted as a repair strategy that is triggered when an ill-formed structure is to surface. Within Optimality Theory (OT), it refers to an output candidate with an extra segment that has no correspondent in the input form. OT [2] is constructed entirely out of constraints. It holds that at the heart of grammar there are constraints rather than rules. Optimal linguistic forms are the outcome of a harmonic evaluation of different output candidates against a set of hierarchically ranked constraints, with the constraints at the top of the hierarchy overpowering the ones below them. Accordingly, since epenthesis is a necessary operation that languages resort to in order to block the formation of marked structures, this means that some well-formedness (or markedness) constraints are ranked higher than the faithfulness (or correspondence) constraints that militate against the insertion of segments. For instance, TA has a constraint against initial triconsonantal clusters. Whenever such a sequence is to be formed as a result of morphological concatenation, an epenthetic [ɪ] breaks it into CvCC (where the lower-case v indicates the epenthetic vowel as opposed to the upper-case V which represents full vowels). The result is a violation of DEPENDENCE, the constraint that militates against output segments having no correspondents in the input form. Crucial enough is the exact locus of the epenthetic vowel, which is determined by the relative ranking of two constraints of the CONTIGUITY family, namely DOMAIN-CONTIGUITY and JUNCTURE-CONTIGUITY [3]. TA prefers to rank the former constraint higher.

One of the interesting discussions raised in this paper is the status of the epenthetic vowel. Contrary to [4], the argument is made here that the syllable with the epenthetic vowel is moraic, yet it shares a mora with the following coda in accordance with the general phonology of TA, which favors codas to be moraic and to participate in syllabic weight. Accordingly, following the rule of Adjunction-to-mora [5], one mora will dominate the epenthetic vowel and the following coda (that is the second consonant in a CCC cluster). The fact that the syllable is never stressed does not owe to nonmoraicity but rather to the general observation that TA never stresses monomoraic syllables. One of the most telling examples in this respect is the passive form [tɪkˈla] (*it was eaten*) where stress, which is generally penultimate in TA, falls onto a CV ultima at the expense of the penultimate CvC. This is explained below as a case of a forced violation of NONFINALITY in order to satisfy the higher ranking Weight-to-stress Principle (WSP).

2 EPENTHESIS IN CCC CLUSTERS

Like the other Maghrebi dialects of Arabic, TA is subject to the high ranking constraint REDUCE [6], which is responsible for syncope, among its other effects. Syncope drops short vowels in open syllables, leaving behind the many observable complex margins. TA, allows a maximum of two consonants at word edges and up to three word-medially. The data in table 1. illustrate this observation.

Table 1. TA clusters across the word

Word-initial clusters		Word-medial clusters		Word-final clusters	
ktib	*he wrote*	yiktbu	*they write*	ktibt	*I/you wrote*
žmaʕ	*he gathered*	tažmʕu	*you (pl) gather*	žmaʕt	*I/you gathered*
ʕmal	*he did*	naʕmlu	*we do*	ʕmalt	*I did*

The CCC clusters in column two above are permissible only word-medially. The reason they do occur in such constructions is because they are not tautosyllabic. Their consonants are rather shared between the syllable on the left and the one on the right. When a triconsonantal cluster is to occur at word edges as a result of concatenation, epenthesis is triggered. The data in table 2. below show how the concatenation of the passive formative /t/ to the left of a CC-initial stem calls for [ɪ] insertion.

Table 2. Epenthesis with the passive formative

C-initial stems				CC-initial stems			
šaaf	*he saw*	**tšaaf**	*it was seen*	kti	*he wrote*	**tɪktib**	*it was written*
qaal	*he said*	**tqaal**	*it was said*	kla	*he ate*	**tɪkla**	*it was eaten*
kassar	*he broke*	**tkassar**	*it was broken*	ʕmal	*he did*	**tɪʕmal**	*it was done*

When the passive formative attaches to the verbs in column 1, it creates a CC sequence that is tolerated word-initially, but when it attaches to the ones in column 2, it forms an impermissible CCC onset that triggers epenthesis. Within OT, the fact that the candidate with an extra segment is selected as optimal means that the constraint hierarchy has a markedness constraint against initial CCC clusters that is ranked higher than correspondence constraints against insertion. This constraint conflict is summarized as follows. First, there is the constraint *COMPLEX [2], which bans syllable nodes to branch. With regard to the onset position, this constraint requires that only one consonant be present under the onset node. Knowing that "all consequences of constraints are also constraints" [7], constraints on consonant sequences are also posited.

Table 3. Constraints on TA clusters

Constraint name		Argument
*COMPLEX	[2]	No more than one C or V may associate to any syllable position node
*$_\sigma$[CC	[8]	Onsets are simple
*$_\sigma$[CCC		Triconsonantal onsets are not allowed

The first two constraints above have the same argument. They both require that onsets be simple. The third constraint is designed following [8]. It is true that a constraint such as *CCC appeared in the literature as early as 1970, with the study of Yawelmani [9], and that within OT, such a constraint is used in works such as [10], [11], and [12], yet it is not deemed satisfactory for the present analysis. The reason is that CCC clusters are allowed in TA (word-medially as shown above), and such a constraint bans all CCC sequences. However, the constraint *$_\sigma$[CCC immediately states that the banned structure is a CCC sequence that occurs word-initially. This constraint ranks higher than the correspondence constraints MAXIMALITY (MAX) and DEPENDENCE (DEP) [13]. MAX requires input segments to be realized in the output form. The reason is that he CCC problem could be solved by the deletion of one of the consonants to render it CC, which is a permissible initial sequence. This is not a possible solution in TA, since the system makes resort to epenthesis to break the cluster. The epenthetic vowel has no correspondent in the input form, thus it violates DEP. TA prefers to epenthesize a vowel rather than to delete a consonant, or in other terms, it prefers to violate DEP rather than MAX. Accordingly MAX ranks higher than DEP but lower than $*_\sigma$[CCC.

Table 4. Constraint tableau: $*_\sigma$[CCC >>MAX>>DEP

/CCC/	$*_\sigma$[CCC	MAX	DEP
a. [CCC]	*!		
b. [CC]		*!	
c. [CɪCɪC]			*!*
d. ? [CɪCC]			*
e. ? [CCɪC]			*

The tableau above shows that other constraints are needed to account for [ɪ]-epenthesis in TA. Candidate (a) is immediately ruled out because it violates the high-ranking constraint $*_\sigma$[CCC. Candidate (b) attempts to satisfy $*_\sigma$[CCC by deleting one consonant of the cluster, thus fatally violating MAX. The rest of the candidates violate DEP. Candidate (c) is eliminated because it incurs two violation by epenthesizing two vowels (interpreted as gradient rather than categorical, DEP indirectly minimizes epenthesis). The problem arises with candidates (d) and (e) which tie, since they both epenthesize only one vowel, but differ as to the exact locus; between C_1 and C_2 or between C_2 and C_3. This issue can be solved by two constraints of the CONTIGUITY family. Reference [3] uses constraints of this family to account for epenthesis in two groups of Arabic dialects, which he terms the Cairene group and the Iraqi group.

Table 5. Epenthesis in the Cairene and Iraqi groups

Cairene Arabic			**Iraqi Arabic**		
VC#	ka.tab	*he wrote*	VC#	ki.tab	*he wrote*
VC**C**+**C**	ka.tab.**t***i*.lu	*I wrote to him*	VC**C**+**C**	ki.ta.**b***i***t**.la	*I wrote to her*
VC**C**#**C**	ka.tab.**t***i*. **g**a.waab	*I wrote a letter*	VC**C**#**C**	ki.ta.**b***i***t**. mak.tuub	*I wrote a letter*

The two dialects of Arabic break the triconsonantal cluster in different ways. In the Cairene group the epenthetic vowel is inserted between the second and the third consonants (CCC → CCiC), while in the Iraqi group it is inserted between the first and the second consonants (CCC → CiCC). The more important generalization is that contiguity is violated in different ways: in Cairene it is violated between morphemes (-btl- > -btil-), while in Iraqi it is violated within tautomorphemic segments (-btl- > -bitl-). Within the theory of *Relativized Contiguity* [3] it is suggested that contiguity constraints be relativized to prosodic domains, such as the syllable, the foot, and the prosodic word. Two of these constraints will account for the difference in the locus of epenthesis.

Table 6. Contiguity constraints

	Constraint name	**Constraint argument**
General schema	Output-CONTIGUITY (O-CONTIG) [2]	The portion of S_2 standing in correspondence forms a contiguous string. Range (R) is a single contiguous string in S_1.
Relativized contiguity	DOMAIN CONTIGUITY (D-CONTIG) [3] JUNCTURE CONTIGUITY (J-CONTIG) [3]	Contiguity between correspondents within a domain D: For some domain D within S_2, all correspondents αβ in D must be contiguous. Where D = {Syllable, Foot, PrWd, etc.} Contiguity between correspondents across identical domains:For two identical domains D and D_{+1} in S_2, where β is the final correspondent in D and α is the first correspondent in D_{+1}, α and β must be contiguous. Where D = {Syllable, Foot, PrWd, etc.}

The relevant domain D for epenthesis here is the syllable. Epenthesizing [ɪ] within a syllable violates D-CONTIG, while epenthesizing it between syllables violates J-CONTIG. The relative ranking of the two constraints relies on whether a given language prefers the structure CvCC or CCvC. Accordingly, CvCC is derived by the ranking J-CONTIG>> D-CONTIG, while CCvC follows from the ranking D-CONTIG>> J-CONTIG. TA obviously prefers to violate J-CONTIG rather than D-CONTIG, since it breaks the CCC cluster into CɪCC. This accounts for the choice of, for instance, [tɪkla]over *[tkɪla](from /t+kla/ (3rd masc. sg. + passive + eat). The hierarchy developed earlier proves to work except for the locus of epenthesis, which is now determined by the relative ranking of the two contiguity constraints. The complete hierarchy is given in table 7 below, along with two additional constraints. The first cares for the realization of morphemic segments and the second governs the alignment of the prefix /t/ with the left edge of the stem. Both constraints rank high alongside *[$_\sigma$CCC as any violation of either one of them is fatal.

Table 7. Additional constraints and final constraint hierarchy

Additional constraints	REALIZE-MORPHEME (RM) [14] ALIGN AFFIX(ALIGN-AFF)	Morphemes in the underlying representation must receive some phonological exponence on the surface The edge of an affix and the edge of a stem must coincide PREF|$_\omega$ and $_\omega$|SUFF
Constraint hierarchy	*[$_\sigma$CCC; RM; ALIGN-AFF >> MAX >> D- CONTIG >> J-CONTIG >> DEP	

This hierarchy correctly predicts the site of epenthesis in TA and succeeds in selecting the optimal output. The tableaux below illustrate the constraint interaction with regard to [tɪktib] (*it was written*) from the input /t+ktib/ and [tɪkla](*it was eaten*) from /t+kla/.

Table 8. *Constraint tableau*: /ktib/, t|$_\omega$→[tɪktib]

/ktib/, t|$_\omega$	*[$_\sigma$CCC	RM	ALLIGN-AFF	MAX	D-CONTIG	J-CONTIG	DEP
a. [tktib]	*!						
b. [ktib]		*!		*			
c. [ktibt]			*!				
d. [tkib]				*!			
e. [tkɪtib]					*!		*
f.☞[tɪktib]						*	

Table 9. *Constraint tableau*: /klaa/, t|$_\omega$→[tɪkla]

/klaa/, t|$_\omega$	*[$_\sigma$CCC	RM	ALLIGN-AFF	MAX	D- CONTIG	J-CONTIG	DEP
a [tkla]	*!						
b. [kla]		*!		*			
c. [klat]			*!				**
d. [tla]				*!			
e. [tkɪla]					*!		*
f. ☞ [tɪkla]						*	*

The reason why the input vowel in /klaa/ is long and it surfaces as short has to do with the cross-linguistically attested phenomenon of final-vowel shortening. It is of no immediate concern here.

3 EPENTHESIS IN CC CLUSTERS

Contrary to epenthesis in CCC clusters, epenthesis in CC clusters occurs at the right edge of the word. What is interesting is that biconsonantal clusters are generally allowed in TA, whether in onset or in coda position. There is one context that triggers [ɪ]-epenthesis, which is the affixation of the negative affix in TA is /ma__š/. Compare for instance [ma-ktib-š] (*he didn't write*) and [ma-maat-**ɪ**š] (*he didn't die*), or [ma-qraa-š] (*he didn't read*) and [ma-šriit-**ɪ**š] (*I didn't buy*). When the stem ends in a VC sequence or in a long vowel, the [š]-particle affixation does not call for epenthesis. On the contrary, when the verb ends in a long vowel followed by a consonant TA resorts to [ɪ]-epenthesis to break the impermissible sequence *V:CC [15]. Within OT, this type of epenthesis is dealt with in a straightforward way, by positing a constraint against the impermissible sequence. Just like the constraint against triconsonantal clusters, constraints involving certain sequences of segments are quite common in OT literature. Examples of them are given in table 10 below.

Table 10. Examples of constraints on segmental sequences

Constraint	Constraint argument
*V:C]$_{\sigma}$	Against long vowels in closed syllables [16]
*V.V	Against vowel hiatus [17]
*VV	Against long vowels [18]
*V:C:	Against a long vowel and geminate consonants being parsed as one syllable [2]
*VVN	Against long vowels followed by nasal codas [8]

None of the constraints above captures the impermissible sequence at hand. I suggest the constraint *V:CC]$_{\sigma}$, which bans tautosyllabic sequences of a long vowel and two consonants. This constraint is in conflict with the correspondence constraint Dep, which requires the sequence /V:C+C/ to surface with no additional segments. With the ranking *V:CC]$_{\sigma}$ >>Dep, epenthesis is possible, yet it is not the only solution. Some of the candidate analyses may resort to shortening the vowel to turn the sequence VVC+C into VC+C, which is permissible as in [makt**<u>ibš</u>**] above. Such a sequence will satisfy *V:CC]$_{\sigma}$, Dep and Max (since all the segments in the input form and the output form have their respective correspondents). Shortening the input vowel is an instance of violation of Identity (Ident), a correspondence constraint that militates for the identity between input and output segments in terms of any given feature F, which is in this case the feature [+long]. This constraint has to be ranked above the other correspondence constraints. The required ranking is *V:CC]$_{\sigma}$>> Ident >> Max >> Dep. This hierarchy is illustrated with two tableaux for [ma-ktib-š]and [ma-maat-**ɪ**š]. The first constraint tableau shows that bases that are not concerned with [ɪ]-epenthesis are not affected by the hierarchy. The second tableau shows that the constraint hierarchy functions in a way that epenthesis is the only permissible process to apply; candidates that resort to vowel shortening or deletion incur a fatal violation of the higher ranked constraint Ident and Max.

Table 11. Constraint tableau: /ktib/+ ma|$_{\omega}$+ $_{\omega}$|š→ [maktibš]

/ktib/; ma|$_{\omega}$; $_{\omega}$|š	*V:CC]$_{\sigma}$	Align-aff	Ident	Max	Dep
a. ☞[maktibš]					
b. [maktibɪš]					*!

Table 12. *Constraint tableau:* /maat/+ ma|$_{\omega}$+ $_{\omega}$|š→ [mamaatɪš]

/maat/; ma|$_{\omega}$; $_{\omega}$|š	*V:CC]$_{\sigma}$	Allign-Aff	Ident	Max	Dep
a. [mamaatš]	*!				
b. [mamatš]			*!		
c. [mamtɪš]				*!	
d.☞ [mamaatɪš]					*

4 The CvC syllable

What is shared among all the syllables formed by the epenthetic [ɪ] is that they are never stressed, whether they are initial or final. A generalization about stress in TA is relevant at this level. TA stresses a heavy penultimate otherwise a superheavy (CVVC or CVCC) ultima. This means that TA does not prefer stress to fall onto the final syllable unless forced by the weight of a final superheavy syllable. In that case, the preferred penultimate stress is sacrificed in order to satisfy the Weight-to-Stress Principle (WSP). Below are examples of different environments of stress in TA. In the third column the derivations comprise the epenthetic vowel.

Table 13. Epenthesis in CC clusters

Penultimate stress	Ultimate stress	Stress and epenthesis
ˈθaʕ.lab *a fox*	maž.ˈnuun *crazy*	tɪk.ˈtib *it was written*
ˈktib.ha *he wrote it*	bar.ˈmažt *I/you programmed*	tɪk.ˈla *it was eaten*

Most of TA stress follows columns 1 and 2. The examples under column 3 are very interesting, not only because they are exceptional but also because they exhibit strange patterns of stress that are not attested elsewhere. In [tɪk.ˈtib], stress falls onto the final syllable even though it is not superheavy, and in [tɪk.ˈla] it even falls onto a final (surface) CV and avoids the otherwise preferred penultimate. Furthermore, the penultimate in both forms has a CVC shape, which always attracts stress in the absence of a following superheavy syllable. Interestingly, in TA there is another example that is very similar to [tɪk.ˈtib], which is [ˈtik.tib] (*you write*). Within CV-theory, this pair of words is very problematic, because in both cases the syllabic structure is CVC.CVC. Such a structure wrongly predicts penultimate stress for *[ˈtɪk.tib], as the penultimate syllable is analyzed as bimoraic. Indicating the syllable with the epenthetic vowel as CvC rather than CVC is just for convenience and does not solve the problem, as in both cases there is a C+V+C sequence. CV-theory misses the point that a CvC syllable never attracts stress because of its weight rather than length. Accordingly, the issue is better tackled within moraic theory [19].

The reason why penultimate CvC in [tɪk.ˈla] and [tɪk.ˈtib] never attracts stress is because it is monomoraic. This makes sense, especially when we know that the epenthetic [ɪ] is the shortest vowel in TA with a duration ranging between 20 and 35ms [15]. There are two ways to interpret CvC as monomoraic. The first one is to consider its coda as nonmoraic, thus the mora will dominate the epenthetic vowel only, as shown in Fig. 1.

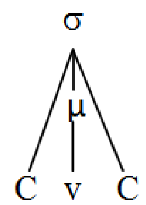

Fig. 1. Non-moraic codas

Although this representation is possible, and in fact found in a number of systems such as Khalkha Mongolian and Lardil [20], it does not fit into the generalization that Arabic has 'Weight-by-Position' set to '*on'.* That is, if codas are elsewhere moraic, then how would we account for their non-moraicity in CvC syllables. The second alternative, which is followed here, is to adopt the notion of 'mora-sharing' where two segments share one mora ([5], [21], [22], [23], and [24]) in accordance with an Adjunction-to-Mora Rule introduced in [5].

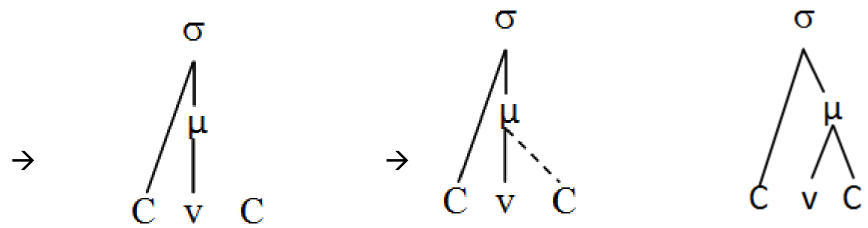

Fig. 2. Adjunction to mora

Interpreting CvC syllables in terms of mora-sharing explains in a straightforward way why they never attract stress. Under Fig. 3 below, there are representations of [tɪk.ˈtib], [ˈtik.tib] and [tɪkˈla].

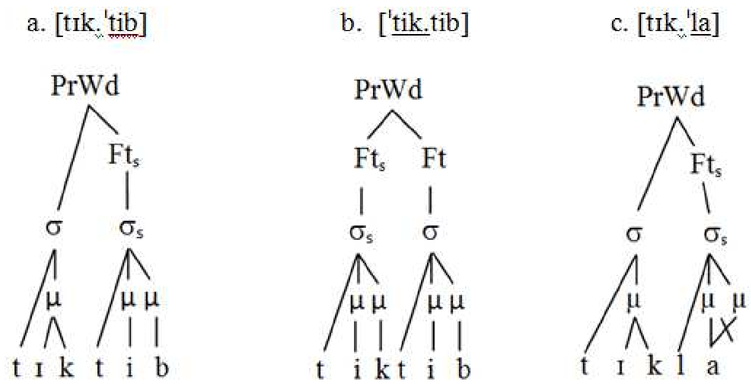

Fig. 3. Stress and monomoraic CvC

In (a), stress falls onto the heavy ultima, as the penult is light. In (b) the initial CVC projects its own foot by virtue of being bimoraic. The final CVC is interpreted as bimoraic in accordance with the representation of [tɪkˈtib]. With two heavy syllables in a sequence, stress prefers to fall onto the penultimate syllable, distinguishing thus between [tɪkˈtib] and [ˈtiktib]. The example under (c), along with all similar passive derivations from CCV stems, is quite strange when it comes to stress. In [tɪk.ˈla], not only is stress final but also it falls onto a CV syllable, while the penult is of the form CvC. The illustration solves the mystery by analyzing the final CV as bimoraic, with a failure to parse the second mora. The preceding CvC is monomoraic, thus unstressable.

Within OT, the interaction between stress and prosodic constituents (mora, syllable, foot, prosodic word, etc.) is captured in terms of constraints. For instance, the fact that the monomoraic CvC never attracts stress reflects the high ranking of the constraint WSP. The fact that TA allows final stress when the word ends in a superheavy syllable means that WSP outranks NONFINality, the constraint that bans final stress. Below, the stress constraints that are *relevant* for the present matter are presented. Following is the ranking argument.

Table 14. Epenthesis in CC clusters

Constraint name	Argument
WEIGHT-TO-STRESS PRINCIPLE (WSP) [2]	Heavy syllables are prominent in foot structure
FOOT BINARITY (FTBIN) [2]	Feet are binary at some level of analysis
PARSE SYLLABLE (PARSE-σ) [25]	Syllables must be footed
NONFINALITY (NONFIN) [2]	No head of PrWd is final in PrWd.

TA prefers to stress a bimoraic syllable, whose presence is guaranteed by the minimal word requirement (PrWd=μμ). Accordingly, WSP will always militate for stressing a bimoraic syllable no matter where it is in the word. It could even be final, and that reflects that WSP outranks NONFIN.FTBIN ranks high, as degenerate feet and ternary feet are banned in TA. PARSE-σ ranks above NONFIN to ensure that syllables are parsed into feet so that NONFIN could evaluate them. Accordingly, the stress hierarchy is WSP; FTBIN >> PARSE-σ >>NONFIN. Combined with the epenthesis hierarchy, it gives the one presented in Fig. 4 below.

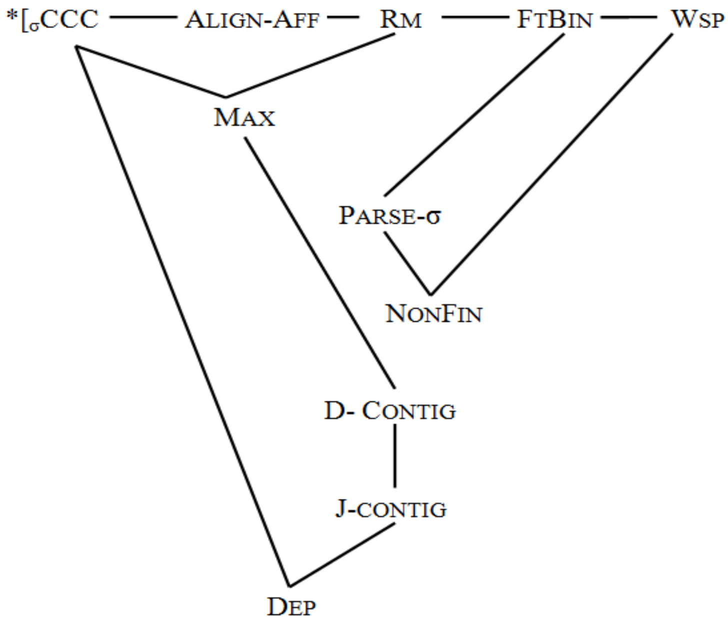

Fig. 4. A combined hierarchy for stress and epenthesis

Constraint tableaux illustrating the distinction between [ˈtik.tib] and [tɪk.ˈtib] are presented under tables 15 and 16. They show how the hierarchy successfully distinguishes between the two forms in terms of stress assignment and syllabification.

Table 15. /ktib/+ t|$_\omega$→ [tɪkˈtib] it was written

/ktib/; t|$_\omega$	*[$_\sigma$CCC	ALLIGN-AFF	RM	FT-BIN	WSP	MAX	PARSE-σ	NON-FIN	D-CONTIG	J-CONTIG	DEP
a. [ˈtktib]	*!							*			
b. [ˈktib]			*!			*		*			
c. [ˈktibt]		*!						*			
d. [ˈtɪk]tib				*!	*		*			*	*
e.☞tɪk[ˈtib]							*	*		*	*

Table 16. /ktib/+ ti|$_\omega$→ [ˈtik.tib] you (sg.) write

/ktib/; ti|$_\omega$	*[$_\sigma$CCC	ALLIGN-AFF	RM	FT-BIN	WSP	MAX	PARSE-σ	NON-FIN	D-CONTIG	J-CONTIG	DEP
a. [ˈtktib]	*!					*$_{(i)}$		*			
b. [ˈktib]			*!			*		*			
c.[ˈktib]ti		*!					*				
d. ti[ˈkib]						*!		*			
e.[tik][ˈtib]								*!			
f.☞ [ˈtik][tib]											

5 CONCLUSION

It has been shown in this paper that TA, like many other systems, resorts to epenthesis to break the impermissible CCC sequences. The exact locus of the epenthetic vowel is governed by the relative ranking of the two contiguity constraints D-CONTIG and J-CONTIG, where it has been argued that TA ranks the former higher than the latter by virtue of prioritizing domain contiguity over juncture contiguity. In other words, it prefers to epenthesize the default [ɪ] between morphemic boundaries rather than domain-internally.

The paper also argued for the need to recognize a new syllable type in the TA syllable inventory, namely the one formed by the epenthetic vowel [ɪ]. This syllable is a monomoraic CvC, where the mora is shared among the nucleic [ɪ] and the following coda, thus satisfying both the required monomoraicity and weight-by-position which is attested in the other syllable types. Among the advantages of the analysis presented here is that it offers a straightforward interpretation of the stress shift in minimal pairs such as [ˈtik.tib] (*you write*) and [tɪk.ˈtib] (*it was written*) by virtue of introducing the monomoraic, hence unstressable, CvC syllable.

REFERENCES

[1] Paradis, C. “On Constraints and Repair Strategies”, *The Linguistic Review,* vol. 6, pp. 71-97, 1988.
[2] Prince, A. and Smolensky, P. *Optimality Theory: constraint interaction in generative grammar*. Maiden: Blackwell. 2004. (Revision of (1993) technical report, Rutgers University Center for Cognitive Science.) Rutgers Optimality Archive – 537
[3] Lamontagne, G. “Relativized contiguity, Part I: Contiguity and syllabic prosody”, Ms. University of British Columbia, Vancouver, Rutgers Optimality Archive – 150, 1996.
[4] Piggott, G. L. “Epenthesis and syllable weight”, *Natural Language and Linguistic Theory* vol. 13, no.2,pp. 283-326, 1995.
[5] Broselow, E. *Parametric variation in Arabic dialect phonology*, In: E. Broselow, M. Eid & J. J. McCarthy (eds.), Perspectives on Arabic linguistics IV, Amsterdam & Philadelphia: Benjamins, pp. 7-45, 1992.
[6] Kirchner, R. “Synchronic Chain Shifts in Optimality Theory”, *LinguisticInquiry* vol. 27, pp. 341-350, 1996.
[7] Norton, R. Derivational Phonology and Optimality Phonology: Formal Comparison and Synthesis. University of Essex, Rutgers Optimality Archive – 613, 2003.
[8] Kager, R. *Stem Disyllabicity in Guugu Yimidhirr*, in: M. Nespor and N. Smith (eds.), Dam phonology, HIL phonology papers II, The Hague:Holland Academic Graphics, pp. 59-101, 1996.
[9] Kisseberth, C. “On the Functional Unity of Phonological Rules”, *Linguistic Inquiry* vol. 1, pp. 291-306, 1970.
[10] Bye, P. *Virtual Phonology: Multiple opacity and rule sandwiching in North Saami*. PhD dissertation, University of Tromso. Rutgers Optimality Archive – 498, 2001.
[11] Nelson, N. *Asymmetric Anchoring*. PhD Dissertation, Rutgers University. Rutgers Optimality Archive – 604, 2003.
[12] McCarthy, J. *The length of stem-final vowels in Colloquial Arabic*, In: M. T. Alhawary and E. Benmamoun, (eds.), Perspectives on Arabic Linguistics XVII-XVIII*,* Amsterdam: Benjamins, pp. 1-26, 2005.
[13] McCarthy, J. and Prince, A. (1995). *Faithfulness and Reduplicative Identity*. In: J. Beckman, L. W. Dickey, and S. Urbanczyk (eds.), University of Massachusetts Occasional Papers in Linguistics: Papers in Optimality Theory, Amherst, MA: GLSA publications, vol. 18, pp. 249-384, 1995.
[14] Kurisu, K. *The Phonology of Morpheme Realization*. Ph.D. dissertation, University of California at Santa Cruz. Rutgers Optimality Archive – 490, 2001.
[15] Ghazali, S. “Du statut des voyelles en arabe”, *Etudes Arabes: Analyses-Théories,* vol. 2/3 no. 8, pp. 199-219, 1979.
[16] Lee, B. “No restructuring constraint and level conditions”. Ms., Seoul National University and University of Massachusetts, Amherst. Rutgers Optimality Archive –167, 1996.
[17] Orgun, C. O. *Sign-Based Morphology and Phonology with special attention to Optimality Theory*. Ph.D. dissertation. University of California, Berkeley, Rutgers Optimality Archive – 171, 1996.
[18] Benua, L. *Identity effects in morphological truncation*. In: J. Beckman, L. W. Dickey, and S. Urbanczyk (eds.), University of Massachusetts Occasional Papers in Linguistics: Papers in Optimality Theory, Amherst, MA: GLSA publications, vol. 18, pp. 77-136, 1995.
[19] Hayes, B. “Compensatory Lengthening in Moraic Phonology”, *Linguistic Inquiry,* vol.20, no. 2, pp. 253-306, 1989.
[20] Zec, D. “Sonority constraints on syllable structure”, *Phonology*,vol. 12, no. 1, pp. 85-129, 1995.
[21] Broselow, E., M. Huffman, Su-I Chen & R. Hsieh, *The timing structure of CVVC syllables,* In: M. Eid (ed.) Perspectities on Arabic linguistics VII, Amsterdam & Philadelphia: john Benjamins, pp. 119-138, 1995.
[22] Broselow, E. Su-I Chen & M. Huffman, “Syllable weight: convergence of phonology and phonetics”, *Phonology* vol. 14, 47-82, 1997.
[23] Watson, J. *The Phonology and Morphology of Arabic,* Oxford: Oxford University Press, 2002.

[24] Watson, J. "Syllabification patterns in Arabic dialects: long segments and mora-sharing", *Phonology,* vol.24, pp. 335-356, 2007.

[25] Hammond, M. The Phonology of English, A Prosodic Optimality-Theoretic Approach. Oxford: Oxford University Press, 1999.