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The Interaction between Assimilation and Anti-Gemination: The definite Article 'I' Assimilation in Turaif Arabic.

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Abstract

Bakovic (2005), states that the avoidance of "sufficiently similar" adjacent consonants, similar except for a small subset of specific features, is the result of interaction between assimilation process and anti-gemination (here, epenthesis); that is to say, epenthesis applies between adjacent non-identical consonants if and only if assimilation between the non-identical consonants would lead to the creation of a geminate. **Pajak** (2009), following Bakovic, provides data from the phonological behavior of pro-clitics and the Coronal Place Assimilation, CPA, in Polish in support of the primary consequence of this analysis and shows that there are contextual constraints on geminates and argues that geminate is avoided via epenthesis in a non-vowel adjacent contexts. In this paper, using Optimality Theory (McCarthy and Prince (1993, 1994) and Prince and Smolensky (1993)), this paper presents an account for the definite article "l" assimilation found in the phonology of the dialect of Turaif Arabic (TA henceforth); a dialect spoken in the northern region of Saudi Arabia. The data show that it is not only adjacent consonants with a small subset of specific features that could result in assimilation but also adjacent consonants that are very different with no shared feature/s or with one and only one shared feature, (+coronal); in addition, the data in one hand support the essence of Pajak's segmental condition on germination; that is to say, gemination always occurs in vowel-adjacent consonants in VCCV contexts. However, on the other hand, the paper, contradicting Pajak's finding, shows that single-vowel-adjacent contexts are also good environment for

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assimilation and germination; neither epenthesis nor deletion is required in a single-vowel-adjacent geminate. I attribute the behavior of the definite article 'l' to a number of highly-ranked interacting constraints in the dialect, *C_{defart}CC, Max (C), and Dep (V). it appears that this phenomenon is just a language specific phenomenon that occurs only and only with the definite article 'l' in Turaif Arabic.

Key Words: Assimilation, Gemination, Dialect, Variation, Cluster

Introduction

Bokvic (2005), studying data from Lithuanian and English hypothesizes that the avoidance of adjacent consonants that are "sufficiently identical" that is identical except for possible differences in a small subset of specific features is the result of the interaction between assimilation and gemination process. In other words, the application of one process (epenthesis) is dependent on the potential result of another (assimilation). Put it differently, epenthesis applies between adjacent consonant if and only if assimilation between them leads to the formation of a geminate. In Lithuanian, for instance, as 1a and b below show, the verbal prefix /at/ and /ap/ are realized as /at^{j}i/ and ap^{j}i/ respectively when prefixed to a stem beginning with a consonant that is sufficiently identical to the consonant of the prefix:

1-a. at^{j}i-t^{j}eis^{j}t^{j}i "to adjudicate" (Bokovic 2005 289)
b. ap^{j}i-put^{j}i **"**to grow rotten"

However, in 2a and b below, the verbal prefix /at/ and /ap/ are realized as /at/ and ap/ respectively because the verbal prefix are prefixed to a stem beginning with a consonant that is sufficiently different consonant:

2- a. at-ras^{j}t^{j}i "to find" (Bokovic 2005 290)
b. ap-kal^{j}b^{j}et^{j}i "to slander"

The other piece of evidence Bokovic provides is the behavior of the English past tense suffix /d/. The suffix is realized as /t/ when it is

preceded by a voiceless consonant (e.g. stop+d becomes stopt); this is because the voiced sound /d/ assimilates to the voiceless sound /p/ resulting in the voiceless sound /t/; in this case, since no geminate is created, no epenthesis takes place. On the other hand, the same suffix /d/ is realized as a /ed/ separated from the preceding /t/ or /d/ sound with a schwa (e.g. need+d becomes needed and seat+d becomes seated). This schwa comes as a result of epenthesis to avoid adjacent identical consonants. In other words, without the schwa, geminates, /dd/ or /tt/ would be created; the latter would result from assimilation; the sound /d/ would assimilate to the sound /t/ creating a geminate.

Pajak (2009) provides other pieces of evidence from Polish data in support of Bokovic's analysis of sufficiently similar adjacent consonant avoidance. In Polish, according to Pajak, sequences of obstruent sounds must agree in voicing which is achieved through regress voicing assimilation. This is done word-internally and across clitics or word boundaries. In case of regressive voicing assimilation of monoconsonanal proclitics (v and z), assimilation always takes place even if geminates are created provided that geminates are adjacent to vowels:

3- a. v+fɔtɛlu ~ f+fɔtɛlu "in the armchair" (Pajak and Bokovic 2009 4)

b. z+sunɔ̃t͡ɕ ~ s+sunɔ̃t͡ɕ "to slip down"

In 3a and b, we see that the proclitic /v/ is assimilated to the following voiceless sound /f/; and the proclitic /z/ assimilates the following voiceless sound /s/. In both cases, geminates are created.

However, assimilation is avoided via epenthesis in word-initially before another consonant.

4- a. v+ftɔrɛk ~ v+ftɔrɛk *f+ftɔrɛk *fɛ+ftɔrɛk "on Tuesday" (Pajak and Bokovic 2009 5)

b. z+skawɔ̃ ~ zɛ+skawɔ̃ * s+skawɔ̃ *sɛ+skawɔ̃ "with a rock"

In 4a and b, a schwa is epenthesized between the monoconsonantal proclitics /v/ and /z/ and the following sounds. Assimilation or geminate

does not apply when adjacent to another consonant. Pajak concludes from those data that avoidance of assimilation in word-initially before another consonant is a segmental context which he refers to as “non-vowel-adjacent” and it is a condition on anti-gemination-driven epenthesis in Polish.

Another piece of evidence Pajak provides is the Coronal Place Assimilation, CPA. CPA is a process of regressive assimilation where the adjacent coronal consonants agree in subcoronal place of articulation. This process applies to the Polish monoconsonantal proclitic /z/ only in vowel-adjacent consonants as the following example shows.

5- a. z+ʐabɔ̃ ~ ʐ+ʐabɔ̃ ‘with a frog’ (Pajak and Bakovic 2009 23)
b. s+ʂazɛt͡ɕ ~ ʂ+ʂazɛt͡ɕ ‘to become gray’

In 5a and b, we see that the proclitic /z/ is assimilated to the following sound in both cases. However, in contexts where non-vowel-adjacent geminate is expected, CPA does not apply. Instead, epenthesis applies.

6- a. z+znakjɛm *z+znakjɛm ‘with a sign’
zɛ+znakjɛm
b. z+stazɛt͡ɕ+ɕɛ̃ *s+stazɛt͡ɕ+ɕɛ̃ ‘to become old’
zɛ+stazɛt͡ɕ+ɕɛ̃

We see in 6a and b that CPA does not apply; instead, a schwa is epenthesized between the proclitic and the following consonant. This is because the context is a non-vowel-adjacent context. In another paper, Pajak states that single-vowel-adjacent geminate in Polish are also avoided pre-consonantly; thus, degemination is applied.

7- a. sevill-a “Seville” sevil-ski “Sevillian” *sevill-ski”
b. frantsus “Frenchman” frantsu-ski “Fench” *frantsus-ski”

In 7a and b, we see that geminates are banned due to the presence of an adjacent following consonant.

Again, Pajak's main idea is that the constraints against geminate incorporate contextual information (word position and adjacent segments). Moreover, the avoidance of sufficiently similar adjacent consonant is a result of interaction of anti-gemination and assimilation process. In other words, where geminate is expected epenthesis applies.

In this paper, using Optimality Theory (McCarthy and Prince (1993, 1994) and Prince and Smolensky (1993)), I provide an account for the definite article "l" assimilation found in the phonology of the dialect of Turaif Arabic (TA henceforth); a dialect spoken in the northern region of Saudi Arabia. In this dialect, as the examples in tables (1) and (2) below show, in a VCCV context, the definite article 'l' fully assimilates to the following [+coronal] consonants, whereas it does not assimilate to [-coronal] consonants.

1- ʔal- tareeχ	ʔat-taareeχ "the history"
2- ʔal-θuub	ʔaθ-θuub "the dress"
3- ʔal-daab	ʔad-daab "the snake"
4- ʔal-ðeeb	ʔað-ðeeb "the wolf"

Table (1): The definite article "l" before (+coronal) in VCCV

1- ʔal- baab	ʔal-baab "the door"
2- ʔal-faas	ʔal-faas "the axe"
3- ʔal-mara	ʔal-mara "the woman"
4- ʔal-kalb	ʔal-kalb "the dog"

Table (2): The definite article "l" before (-coronal) in VCCV

We see from table (1) that the definite article "l" fully assimilates to the following (+coronal) sound in the VCCV context; whereas it does not assimilates to the following (-coronal) sound in the same context. Surprisingly, in the same dialect in a VCCCV context, the definite article 'l' fully assimilates to all the following [+/- coronal] sounds, as the following examples show:

1- ʔa**l- b**reek	ʔa**b-b**reek "the brake"
4- ʔa**l-k**raaʕ	ʔa**k-k**raaʕ "the goat"
3- ʔal-traab	ʔat-traab "the soil"
4- ʔal-ryaal	ʔar-ryaal "the riyal"

Table (3): The definite article "l" before (+/-coronal) in VCCCV

We see from table (3) that the definite article "l" in the VCCCV contexts does not only fully assimilate to the following (+coronal) sounds, "t" and "r" but it also fully assimilates to the following (-coronal) sounds, "**b**" and "**k**".

2. Data

What makes Turaif Arabic phonologically interesting compared to other the Standard Arabic is that the definite article "l" fully assimilates to (-coronal) sounds in VCCCV clusters. This is different from Standard Arabic where the definite article "l" only assimilate to (+coronal) sounds. It is propose that the assimilation of the definite article "l" to the (-coronal) sound results from the ban of having three adjacent consonants in the dialect the first of which is the definite article.

The following two tables show the consonants and vowels found in this dialect of Arabic.

Manner ↓ / Place →	Labial	Labio dental	Interdental	Dental		Post-alveolar	Palatal	Velar	Uvular	Pharyngeal	Glottal
				Plain	Emphatic						
Plosive	b			t d	T D			k g	q		ʔ
Fricative/affricate	f		θ ð	s z Z	S	ʃ dʒ		x ɣ		ħ ʕ	h
(Central) approximant	w					r	j				
(Lateral) approximant				l							
Nasal	m					n					

Table (4) Consonant inventory of Turaif Arabic.

	Front	Central	Back
High	ii i		uu u
Mid			
Low		aa a	

Table (5) Vowel inventory of Turaif Arabic.

2.1. The definite article "l" in the VCCV context:

In this dialect, when the definite article 'l' is followed by [+coronal] consonants in VCCV context, it fully assimilates to them in place, voicing and manner. The following table shows all the (+ coronal) sounds to which the definite article assimilates:

1- ʔal- tareeχ	ʔat-taareeχ	"the history"
2- ʔal-θuub	ʔaθ-θuub	"the dress"
3- ʔal-daab	ʔad-daab	"the snake"
4- ʔal-ðeeb	ʔað-ðeeb	"the wolf"
5- ʔal-ramil	ʔar-ramil	"the sand"
6- ʔal-zahra	ʔaz-zahra	"the rose"
7- ʔal-suuq	ʔas-suuq	"the market"
8- ʔal-ʃams	ʔaʃ-ʃams	"the sun"
9-ʔal-Suum	ʔaS-Suum	"the fast"
10- ʔal-Daw	ʔaD-Daw	"the light"
11- ʔal-Taalib	ʔaT-Taalib	"the student"
12- ʔal-Zulm	ʔaZ-Zulm	"the unfair"
13- ʔal-leel	ʔal-leel	"the night"
14- ʔal-nesl	ʔan-nesl	"the offspring"
15- ʔal- dʒaaluun	ʔadʒ- dʒaaluun	"the gallon"

Table (6): The definite article "l" before (+coronal) consonants in VCCV.

The above table (6) above shows that in a VCCV context that the definite article 'l' fully assimilates the following [+coronal] sounds in place, manner and voicing. In other words, there is only one feature that group the definite article 'l' with those [+coronal] sounds; it is [+coronal]. On

one hand, the data supports the existence and the low ranking of Pajak's proposed markedness constraint *NoGem/V-V. However, on the other hand, the data shows that it is not as Bokovic (2005) claims that is only adjacent consonants with a small subset of specific features could result in assimilation but also adjacent consonants that are very different except for only one feature, (here, coronality).

On the other hand, when the definite article 'l' is followed by [- coronal] consonants, assimilation does not apply.

1- ʔal-ʔarD	ʔal-ʔarD	"the land"
2- ʔal-baab	ʔal-baab	"the door"
3- ʔal-juum	ʔal-juum	"today"
4- ʔal-ħaleeb	ʔal-ħaleeb	"the milk"
5- ʔal-χeer	ʔal-χeer	"the virtue"
6- ʔal-ʕeen	ʔal-ʕeen	"the eye"
7- ʔal-ɣaaz	ʔal-ɣaaz	"the gas"
8- ʔal-faas	ʔal-faas	"the axe"
9- ʔal-quus	ʔal-quus	"the bow"
10- ʔal-kasal	ʔal-kasal	"the laziness"
11- ʔal-maaʔ	ʔal-maaʔ	"the water"
12- ʔal-habeelah	ʔal-habeelah	"the idiot"
13- ʔal-walad	ʔal-walad	"the boy"

Table (7): The definite article "l" before (-coronal) consonants in VCCV.

The above table (7) shows that the definite article 'l' does not assimilate to the following [-coronal] sounds in the VCCV context.

2.2. The definite article "l" in the VCCCV context:

On the other hand, when the definite article 'l' appears in a VCCCV context, it fully assimilates to all [+/-coronal] consonants.

1- ʔal-traab	ʔat-traab	"the soil"
2- ʔal-θfaal	ʔaθ-θfaal	"the bread container"
3- ʔal-dmaaɣ	ʔad-dmaaɣ	"the head"

4- ʔal-ðraaʕ	ʔað-ðraaʕ	"the arm"
5- ʔal-ryaal	ʔar-ryaal	"the Riyal"
6- ʔal-zkaam	ʔaz-zkaam	"the common cold"
7- ʔal-snaafi	ʔas-snaafi	"the decent man"
8- ʔal-ʃraaʕ	ʔaʃ-ʃraaʕ	"the cover"
9- ʔal-Sχaam	ʔaS-Sχaam	"the sorrow"
10- ʔal-Dmaadah	ʔaD-Dmaadah	"the bandage"
11- ʔal-Tlaabah	ʔaT-Tlaabah	"the problem"
12- ʔal-ZraaT	ʔaZ-ZraaT	"the stool"
13- ʔal-lħaam	ʔal-lħaam	"the welding"
14- ʔal-nʕaas	ʔan-nʕaas	"the awakeness"
15- ʔal- dʒfaar	ʔadʒ- dʒfaar	"the young male goats"
16- [1]ʔal-ʔ.....		
17- ʔal-breek	ʔab-breek	"the brake"
18- ʔal- j.....		
19- ʔal-ħlimah	ʔaħ-ħlimah	"the nipple"
20- ʔal-χbaal	ʔaχ-χbaal	"the craziness"
21- ʔal-ʕtebah	ʔaʕ-ʕtebah	"the stair/step"
22- ʔal-ɣmaas	ʔaɣ-ɣmaas	"the soup"
23- ʔal-fruuχ	ʔaf-fruuχ	"the chicks"
24- ʔal-qraʕah	ʔaq-qraʕah	"the hairless head"
25- ʔal-kmaχah	ʔak-kmaχah	"the stupid"
26- ʔal-mʕazah	ʔam-mʕazah	"the goat"
27- ʔal-hbaal	ʔah-hbaal	"the craziness"
28- ʔal-wlaɣah	ʔaw-wlaɣah	"the Wlaqhah"

Table (8): The definite article "l" before (+/-coronal) consonants in VCCCV.

The above table (8) shows the definite article 'l' assimilates fully to all the following [+/-coronal] sounds. Epenthesis or deletion does not apply. This

[1] Words beginning with the sound /ʔ/and /j/ are not found in TA because of the difficulty in pronunciation.

data contradicts Pajak's (2005) findings; in other words, geminates are not avoided in a single-vowel-adjacent context. Moreover, the data show that although there is not any shared feature between the definite article 'l' and the following [-coronal] sounds, assimilation of the definite article 'l' occurs. Again, we see that it not as Bokovic (2005) claims that is only adjacent consonants with a small subset of specific features that could result in assimilation but also adjacent consonants that are very different.

To recap, the data under studying show the following:
- The definite article "l" fully assimilates to the following (+coronal) sounds in the VCCV context.
- The definite article "l" does not assimilate to the following (-coronal) sounds in VCCV context.
- The definite article "l" fully assimilates to the following (-/+coronal) sounds in the VCCCV context.

3. An OT Analysis

This section provides an optimality-theoretic analysis of the definite article "l" assimilation in TA. First, to account for the definite article 'l' assimilation to the following [+coronal] sounds, besides Pajak's markedness constraint *NoGem/V-V which is ranked low, we need, following Lombardi's (1999), the markedness constraint Agree; in the data in hand, Agree needs to be in place, manner and voicing.

***NoGem/V-V:**
Geminates flanked by vowels are not allowed (no intervocalic geminates) (Pajak's 2009).

Agree (pl,m.v.):
Obstruent clusters should agree in place, manner and voicing.

Besides, the faithfulness constraint ID (pl) is required since there is no change in the place feature in assimilation in the VCCV context.

2-ID (place):

The specification for the feature [place] of an input segment must be preserved in its output correspondent.

Since there is no change in the place, the faithfulness constraint ID (pl) is ranked high. We can see in the data investigated that the manner of articulation of the lateral is violated, so we need a third constraint to account for that which should be ranked low compared to the above constraints.

ID (son):
The specification for the feature [sonorant] of an input segment must be preserved in its output correspondent.

Despite the fact that the sequence the definite 'l' plus coronal is marked in TA; TA does not permit insertion of a vowel to break such a cluster; so, we need a constraint that could take care of that as well; and it needs to be ranked high.

DEP-IO:
Output segments must have input correspondents. (No epenthesis) (Kager 1999)

Let us see how those constraints compete to yield the optimal candidate /ʔaddaab/, 'the snake'.
(9) /ʔal-daab/→/ʔad-daab/ "the snake"

Inp/ʔal-daab/	ID (pl.)	DEP-IO	Agree (plmv)	ID (son)	*NoGem/V-V
ʔaddaab				*	*
ʔal daab			*!		
ʔalidaab		*!			

We see that in tableau (9) above the optimal candidate /ʔad-daab/ "the snake" violates the two constraints ID (son) and *NoGem/V-V at the

expense of satisfying the faithfulness constraints ID (pl) and DEP-IO and the marked-ness constraint Agree (pl.m.v.). The first rival loses because of being faithful to the input and violating the marked-ness constraint Agree (pl.m.v.); as for the third candidate, it violates the faithfulness constraint DEP-IO which makes it lose

Some optimal candidates like /ʔarramil/, 'the sand' has the sonorant /r/ in the output which means that the **sonority** is not violated but the laterality is. So, we need a new constraint for violating laterality which should be ranked low.

ID (lat):
The specification for the feature [lateral] of an input segment must be preserved in its output correspondent.
Let us see the optimal candidate /ʔar-ramil/ "the sand":
(10) /ʔal-ramil/→/ʔar-ramil/ "the sand"

Inp/ʔal-ramil/	ID (pl.)	DEP-IO	Agree (plmv)	ID (son)	*NoGemV-V	ID (lat)
ʔar-ramil					*	*
ʔal-ramil			*!			

The optimal candidate /ʔar-ramil/ "the sand" in the above tableau violates besides *NoGem/V-V the feature ID (lat); we see that ID (son) is not violated. The other candidate loses because of being highly faithful to the input and violating the constraint Agree (pl.m.v.).
The optimal candidate does not violate any of the features voicing or place, but the following candidate which despite of violating the voicing feature wins, /ʔassuuq/, 'the market'. Since this optimal candidate violates voicing, so, we need a new constraint ID (voice) which should be ranked low.

ID (voice):
The specification for the feature [voice] of an input segment must be preserved in its output correspondent.

Here is the optimal candidate /ʔassuuq/ "the market":

(11) /ʔal-suuq/→/ʔas-suuq/ "the market"

Input:/ʔal-suuq/	ID (pl.)	DEP-IO	Agree (plmv)	ID (son)	*NoGem/V-V	ID (lat)	ID (v)
ʔassuuq				*	*	*	*
ʔal suuq			*!				
ʔat suuq			*!	*		*	*

The optimal candidate /ʔas-suuq/ "the market" in tableau (11) above violates three faithfulness constraints, ID (son), NoGem/V-V, ID (lat) and ID (v). The first rival loses because of being faithful to the input and violating the marked-ness constraint Agree (pl.m.v.); whereas the third candidate is ruled out because of violating the four constraints Agree (pl.m.v.), ID (son), ID (lat) and ID (v).

Now what about changing the /s/ sound in the onset to /l/, would that yield the optimal candidate; it will not. Therefore, we need a constraint that could prevent the change in the sound in the onset; the constraint ID onset (pl.m.v.) will do the job. It should be ranked high.

IDonst (pl.m.v.):
Any correspondent of an onset segment specified as F must be F.

(12) /ʔal-suuq/→/ʔas-suuq/ "the market"

Inpt: /ʔal-suuq/	IDonst (pl.m.v.)	ID (pl)	DEP-IO	Agree (pmv)	ID (son)	*NoGem/V-V	ID (lat)	ID (v)
ʔassuuq					*	*	*	*
ʔa l luuq	*!							*
ʔal suuq				*!				

/ʔassuuq/ wins because it does not violate the highly ranked constraint IDonset (plmv); this new constraint IDonset (pl.m.v.) takes care of the second candidate. The third candidate is being totally faithful but it violates the marked-ness constraint Agree (pl.m.v.).

The question is whether a candidate such a /ʔa-suuq/ can win or not**.** This candidate will not win since deletion does not apply in the language. So, we need a constraint that could prevent deleting any consonant. It is MAX (C) which is ranked high.

MAX (C):
Input segments must have output correspondents. (No deletion).

(13) /ʔal-suuq/→/ʔas-suuq/ "the market"

Inp/ʔal-suuq/	MAX (C)	IDonst(plmv)	ID (pl.)	DEP-IO	Agree (plmv)	ID (son)	*NoGem/V-V	ID (lat)	ID (v)
ʔassuuq						*	*	*	*
ʔa-suuq	*!					*			*

We see here that the new constraint takes care of the new rival /ʔa-suuq/. Still the optimal candidate /ʔas-suuq/ violates the same lower constraints.

Such analysis predicts full assimilation for such sequence in any level, word or phrase level, which is contrary to what is in the dialect. Let us see what is there across the word-boundaries.

Here are some examples across the word-boundaries:
8- a. qaal shai, "He said something."
b. zaal damih "His blood stopped"

In 8a and b that, across the word-boundaries, the 'l' at the end of the words does not assimilate to the following [+coronal] sounds. The same is true if the 'l' part of the root.

Here some examples where the non-definite 'l' appears word internally:

9- a. balshaan "He got involved."
b. saltaan "A liar"
c. khaldhaan "mistaken".

Again, we see in 9 that, word-internally, the 'l' does not assimilate to the following [+coronal] sounds.

From the examples in 8 and 9 above, I conclude that we need a faithfulness constraint that could protect the lateral 'l' that appears in such contexts above. The following constraint will do the job.

ID root(pl.m.v):
Any correspondent of the root segment specified as F must be F.

See the following tableau for the optimal candidate /zaal damih/ "His blood stopped":

(14) /zaal damih /→/zaal damih / "his blood stopped"

/zaal damih /	IDroot (pl.m.v)	MX (C)	IDonst (plmv)	ID (pl.)	DEP-IO	Agree (plmv)	ID (son)	*NoGem/ V-V	ID (lat)	ID (v)
zaal damih						*				
zaad damih	*!						*	*	*	
zaal lamih	*!		*					*		

We see that in tableau (14) above the optimal candidate only violates the marked-ness constraint Agree (pl.m.v) along with the low ranked constraint *NoGem/V-V. With regard to the other two candidates, both violate the highly ranked faithfulness constraint ID root(pl.m.v.); so, both are ruled out. Besides, the first of which violates ID (son), *NoGem/V-V, and ID (lat) and the second violates ID onset (pl.m.v.).

The 'l' in the optimal candiate /balʃaan/ "He got involved":

(15) / balʃaan /→/ balʃaan / "he got involved"

/balʃaa	IDroot	M	IDonst(plm	ID	DEP	Agree	ID	*NoGem/V	ID	ID

n /	(pl.m.v)	X (C)	v)	(pl.)	-IO	(plmv)	(son)	-V	(lat)	(v)
balʃaa n						*				
baɲʃaan	*!						*	*	*	*
ballaan	*!		*					*		*

The above table (15) the optimal candidate only violates the marked-ness constraint Agree (pl.m.v.) whereas the second two candidates do not violate such a constraint. Despite the fact they do not violate this constraint, they are ruled out because of violating the highly ranked constraint, ID root (pl.m.v.) that is not violated by the optimal candidate. In addition, the second constraint violates the lower constraints ID (son), *NoGem/V_V, ID (lat), ID (v); and the third candidate violates the constraints ID onst, NoGem/V_V, and ID (v).

Pajak's (2009) constraint *NoGem/1VA is ranked very low since assimilation is not avoided in a single-vowel-adjacent contexts.

***NoGem/1VA**

Geminates adjacent to exactly one vowel are not allowed (no single vowel adjacent (1VA) geminates).

Let us see first the optimal candidate /ʔal-snaafi/, 'the decent"

(16) / /ʔal-snaafi /→/ /ʔas-snaafi / "he got involved"

Inp/ʔal-snaafi/	IDroot (plmv)	MX (C)	IDonst (plmv)	ID (pl.)	DEP-IO	Agree (plmv)	ID (son)	*NoGem/V_V	ID (lat)	ID (v)	*NoGem/1VA
ʔassnaafi							*		*	*	*
ʔalsnaafi						*					
ʔa-snaafi		*!									
ʔal-naafi		*	*							*	
ʔal lnaafi			*!							*	*
ʔalisnaafi					*!						
ʔarsnaafi						*!			*		

It is clear from tableau (17) that the same constraint ranking can yield the optimal candidate in assimilation that takes place in $VC_{defart}CCV$ sequence. As the tableau shows, the optimal candidate only violates the low ranked constraints, ID (son), ID (lat), ID (v) and *NoGem/1VA. The second candidate violates the faithfulness constraint Agree (pl.m.v.) which makes it lose the race. The third candidate loses because of violating the highly ranked constraint Max (C). As for the forth candidate, it loses because violating the highly ranked constraints, Max (C) and IDonset (pl.m.v.); besides, the candidate violates the other lower constraint ID (v). The fifth candidate /ʔallaas/, is ruled out because of violating IDonset (plmv); besides, it violates ID (v) and *NoGem/1VA constraints. The sixth candidate /ʔalisnaafi/ loses because violating the highly ranked constraint DEP-IO. Finally, the seventh and last candidate loses because of violating the Agree (pl.m.v.) constraint along with the lower constraint ID (lat).

So far, we see that the proposed constraints yield correctly all the optimal candidates. Now, let us see if the same constraints can yield the optimal candidate /ʔal-fruuχ/→/ʔal-fruuχ/ “the chicks”. We see that in the optimal candidate /ʔal-fruuχ/→/ʔal-fruuχ/ “the chicks” the definite article assimilates to a [-coronal] sound; this is to say that the optimal candidate violates the constraint ID (pl.). This means that ID (pl.) needs to be ranked lower than the highly ranked constraints IDroot (plmv), Max (C) and DEP-IO. With this new ranking, let us see if we can get the optimal candidate /ʔal-fruuχ/→/ʔal-fruuχ/ “the chicks”.

(17) /ʔal-fruuχ/→/ʔal-fruuχ/ “the chicks”

Inp/ʔal-fruuχ/	IDroot (plmv)	MX (C)	IDonst (plmv)	DEP-IO	ID (pl)	Agree (plmv)	ID (son)	*NoGem/V_V	ID (lat)	ID (v)	*NoGem/1 VA
ʔaffruuχ					*		*		*	*	*
ʔalfruuχ						*					
ʔa-fruuχ		*!									
ʔal-ruuχ		*	*							*	
ʔal lruuχ			*!							*	*

ʔalifruuχ					*!						

We see from the tableau above, that second candidate /ʔalfruuχ/ wins where it only violates Agree (plmv); but this candidate is not the optimal candidate. Although the first candidate violates the constraint ID (pl) which is higher than the candidate Agree (plmv), we want the first candidate /ʔaffruuχ/ to win. In other words, we need a constraint that is higher than ID (pl) and is violated by the candidate /ʔalfruuχ/. I propose at this point the constraint *C_{defart}CC since in TA, C_{defart}CC clusters in which the first C is the definite article "l" are not allowed.

***C_{defart}CC**

C_{defart}CC clusters are not allowed.

The question is how the above constraint along with other constraints yields correctly the optimal candidate /ʔal-fruuχ/, 'the chicks".

(18) / /ʔal-fruuχ/→/ /ʔal-fruuχ// "the chicks"

Inp/ʔal-fruuχ/	*C_{defart}CC	IDroot (plmv)	MX(C)	IDonst (plmv)	DEP-IO	ID (pl)	Agree (plmv)	ID (son)	*NoGem/V_V	ID (lat)	ID (v)	*NoGem/1VA
ʔaffruuχ						*		*		*	*	*
ʔalfruuχ	*						*					
ʔa-fruuχ			*!									
ʔal-ruuχ			*	*							*	
ʔal lruuχ				*!							*	*
ʔalifruuχ						*!						

With everything else is the same, we see from tableau (18) above, that the new highly ranked constraint *C_{defart}CC rules out the second candidate /ʔalfruuχ/. That is to say, with its violation of the constraint ID ((pl.), the optimal candidate /ʔaffruuχ/ wins.

In sum, below is the constraint ranking that yields and accounts for the distribution of definite article assimilation in TA:

***C_{defart}CC, ID root (pl.m.v.), MAX (C), ID onest (pl.m.v.), DEP-IO>> ID (pl) >>Agree (pl.m.v.) >> ID (son)>>*NoGem/V_V, ID (lat), ID (v), *NoGem/1VA.**

We see that *C_{defart}CC, IDroot (plmv), Max (C), IDonset (plmv), and DEP-IO are highly ranked in TA; this ranking forces the creation of geminates in VC_{defart}CCV contexts regardless if there is or there is not a shared feature between the definite article 'l' and the following sound.

Conclusion

In this paper, in one hand, I have shown, supporting Pajak's findings, that the context (word position, and adjacent segments) is an essential characteristics of geminates; gemination always occurs in vowel-adjacent consonants in VCCV contexts. On the other hand, contradicting Pajak's finding, the date show that single-vowel-adjacent contexts are also good environment for assimilation and germination; neither epenthesis nor deletion is required in a single-vowel-adjacent geminate. Moreover, I have shown, contradicting Bakovic's (2005) findings, that it is not only adjacent consonants with a small subset of specific features that could result in assimilation but also adjacent consonants that are very different with no shared feature/s or with only one and only shared feature, coronal. I have attributed the behavior of the definite article 'l' to a number of highly-ranked interacting constraints in the dialect, *C_{defart}CC, Max (C), and Dep (V); the *C_{defart}CC constraint is found in the phonology of Turaif dialect to take care of prohibiting the formation of the CCC cluster where the first C in this cluster is the definite article "l". I would say that this phenomenon is just a language specific phenomenon that occurs only and only with the definite article 'l' in Turaif Arabic.

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