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An Autosegmental Account of Melodic Processes in Jordanian Rural Arabic

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ABSTRACT

This study aims at providing an autosegmental account of feature spread in assimilatory situations in Jordanian rural Arabic. I hypothesise that in any assimilatory situation in Jordanian rural Arabic the undergoer assimilates a whole or a portion of the matrix of the trigger. I also hypothesise that assimilation in Jordanian rural Arabic is motivated by violation of the obligatory contour principle on a specific tier or by spread of a feature from a trigger to a compatible undergoer. Data of the study were analysed in the framework of autosegmental phonology with focus on the notion of dominance in assimilation. Findings of the study have revealed that an undergoer assimilates a whole of the matrix of a trigger in the assimilation of /t/ of the detransitivizing prefix /ʔɪt-/, coronal sonorant assimilation, and inter-dentalization of dentals. However, partial assimilation occurs in the processes of nasal place assimilation, anticipatory labialization, and palatalization of plosives. Findings have revealed that assimilation occurs when the obligatory contour principle is violated on the place tier. Violation is then resolved by deletion of the place node in the leftmost matrix and by right-to-left spread of a feature from rightmost matrix to leftmost matrix. It has been also revealed that spread of a primary or a non-primary feature from a trigger to an undergoer can motivate assimilation to occur in some assimilatory situations in Jordanian rural Arabic.

Key words: Melody, Autosegmental Phonology, Dominance Model, Obligatory Contour Principle, Assimilation, Jordanian Rural Arabic

INTRODUCTION

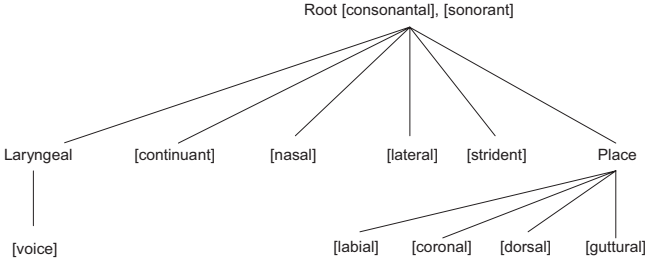
Assimilation involves spread of phonological features in an autosegmental representation. This study aims at investigating melodic processes in Jordanian rural Arabic (JRA, henceforth) and providing an autosegmental account of feature spread in different assimilatory situations. I hypothesise that in any assimilatory situation in JRA the undergoer assimilates a whole or a portion of the matrix of the trigger. I also hypothesise that assimilation in JRA is motivated by violation of the obligatory contour principle (OCP, henceforth) on a specific tier or by spread of a feature from a trigger to a compatible undergoer. Being myself a phonologist and a native speaker of Jordanian Arabic, I collected my data by observing native speakers of Jordanian rural Arabic and communicating with them in cafes, neighbourhood and workplace.

Data of the study will be analysed in the framework of Goldsmith's (1976a, 1976b, 1990) theory of autosegmental phonology, mainly adopting Mohanan's (1993) notion of dominance in assimilation, as it deals primarily with assimilation and non-tonal feature spread. In section 2, I outline the phonological features assumed for the underlying specifications of the phonemes of JRA (see appendix 1 for phonetic description of JRA phonemes). In section 3, I summarise the main aspects of Goldsmith's (1976a, 1976b, 1990) theory of autosegmental phonology and Mohanan's (1993) notion of dominance in assimilation. I analyse melodic processes of assimilation in JRA in section 4. A conclusion is provided in section 5.

PHONOLOGICAL FEATURES OF JRA PHONEMES

The feature geometry tree for Arabic shown in (1) below which is adopted in this article combines proposals by Clements (1985), Sagey (1986), McCarthy (1988), Selkirk (1988, 1993), Shaw (1991), and Halle (1992).

(1) Feature Geometry Tree for Arabic (Watson: 2002, 25)



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As shown in the geometry tree, there are four groups of features in Arabic: root features which include [consonantal] and [sonorant], stricture features which include [continuant], [nasal], [lateral], and [strident], place features which include [labial], [coronal], [dorsal] and [guttural], and the laryngeal feature [voice].

Root Features

The root features are [consonantal] and [sonorant]. The feature [consonantal] denotes segments produced in the oral cavity with a major obstruction (Odden, 2005, cf. Halle, 1992). The definition excludes the JRA consonants /h/, /ḥ/, /ʔ/ and /ʕ/ as these segments are produced in the pharyngeal cavity. To include these consonants, the feature [consonantal] should be redefined as sounds which have a major obstruction in the oral cavity or pharyngeal cavity. Accordingly, obstruents, nasals and liquids are [+cons]. Glides and vowels are [-cons]. 'Sonorants are sounds produced with a vocal tract cavity configuration in which spontaneous voicing is possible' (Chomsky and Halle, 1968: 302). Nasals, liquids, glides and vowels are [+son]. Obstruents are [-son]. The root features distinguish between consonants and vowels in JRA as shown in (2).

2) Root features of JRA phonemes

	Obstruent	Sonorant	Vocoid
[son]	-	+	+
[cons]	+	+	-

Stricture Features

Segments in JRA can also be defined in terms of their manner or stricture features. The stricture feature [continuant] denotes segments where 'the primary constriction is not narrowed so much that airflow through the oral cavity is blocked' (Odden, 2005: 145). Segments which are labelled [+lateral] are produced by lowering the mid-section of the tongue at one side in which lateral release of air occurs. Segments which are [+nasal] are produced by lowering the velum in which nasal release of air occurs. The acoustic feature [strident] denotes segments which are 'produced with greater noisiness' (Odden, 2005: 162). The table in (3) shows stricture features of JRA consonantal phonemes.

(3) Stricture features of JRA consonantal sonorants and obstruents

	Plosive	Fricative	Sibilant	Nasal	Lateral
[cont]	-	+	+	-	-
[lateral]	-	-	-	-	+
[nasal]	-	-	-	+	-
[strident]	-	-	+	-	-

Laryngeal Features

JRA phonemes have one applicable laryngeal feature which is [voice]. The feature [voice] refers to vibration of vocal cords. Segments involving the feature [-voice] are produced with the vocal cords being far apart, see (4).

(4) Laryngeal features of JRA phonemes

[+voice]: b, d, ḍ, ð, ð, g, z, ʤ, ɣ, ʕ, m, n, l, r, j, w
[-voice]: t, ṭ, θ, k, ʔ, f, s, ṣ, ʃ, ʧ, x, ḥ, h

Place Features of JRA Phonemes

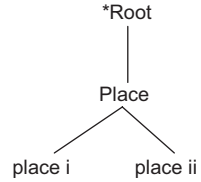
There are four place features in JRA: [labial], [coronal], [dorsal] and [guttural], which are presented in detail in the following subsections. Following Selkirk (1993: 3; cited in Watson, 2002: 29), phonetic interpretation of place features can be used to reduce the number of phonological features as shown in (5).

(5) The Phonetic Interpretation of Place Features (Selkirk, 1993: 3; cited in Watson, 2002: 29).

a. The Phonetic Interpretation of Primary Place (PIPP)
   The phonetic realization of a primary feature is necessarily contingent on the stricture features of the segment containing it. It may also be contingent on non-primary features of the segment.
b. The Phonetic Interpretation of Non-primary Place (PINP)
   The phonetic realization of a non-primary place feature may be independent of the other features of the segment containing it, or it may be contingent on the other place and/or stricture features of the segment.
c. Rank–Stricture Correspondence (RSC)
   The degree of constriction in the articulation realizing a non-primary place feature in a segment does not exceed the degree of constriction of the articulation of a primary place feature in the same segment.

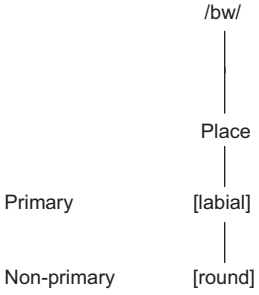
For Selkirk (1993; cited in Watson, 2002: 30), there is a primary/non primary place distinction for the segment which has more than one articulation even in the case where the two articulations have the same degree of constriction, as shown in (6).

(6) No dual primary place (Selkirk, 1993: 32; cited in Watson. 2002: 30)



Accordingly, the JRA /bw/ is represented as shown in (7), in which the place node dominates the primary feature which in turn dominates immediately the non-primary feature.

(7) The Representation of Primary and Non-Primary Features of JRA /bw/



The feature [labial]

The feature [labial] denotes sounds 'produced with the lips' (Odden, 2005: 162). The [labial] consonants in JRA are /b, m, f, w/, see (8) below.

(8) Features of [labial] consonants in JRA

	b	m	f	w
[son]	-	+	-	+
[cons]	+	+	+	-
[cont]	-	-	+	+
[nasal]	-	+	-	-
[voice]	+	+	-	+

Based on the observation of labial sounds in several languages, Selkirk (1993, 54; cited in Watson, 2002: 29) comes out with the generalization in (9).

(9) The phonetic interpretation of primary [labial]
1. A primary [labial] stop is bilabial.
2. A primary [labial] fricative is labiodental.
3. A primary [labial] vocoid is round.

The feature [coronal]

The feature [coronal] describes segments which involve raising the tip or blade of tongue from the neutral position. Table (10) differentiates between coronals in JRA.

(10) Features of the [coronal] consonants in JRA

	t	ṭ	d	ḍ	θ	ð	s	ṣ	ʃ	z	ǰ	ʧ	ʤ	n	l	r
[son]	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+
[cont]	-	-	-	-	+	+	+	+	+	+	+	-	-	-	+	+
[lat]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
[nasal]	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-
[voice]	-	-	+	+	-	+	-	-	-	+	+	-	+	+	+	+
[dist]	-	-	-	-	-	-	-	-	+	-	-	+	+	-	-	-
[strident]	-	-	-	-	-	-	+	+	+	+	-	+	+	-	-	-
[dorsal]*	-	+	-	+	-	-	-	+	-	-	+	-	-	-	+	-

The non-primary [dorsal] feature is used to distinguish between JRA phonemes /s/ and /ṣ/. Coronals in JRA are distinguished by the phonetic interpretation of place features, as shown in (11).

(11) The phonetic interpretation of primary [coronal]
1. A primary [coronal] stop is interdental or dental.
2. A primary [coronal] fricative is alveolar.
3. A primary [coronal] affricate is post-alveolar.

The feature [dorsal]

The feature [dorsal] describes segments with constriction of the tongue body. For the phonetic interpretation of primary [dorsal], see (12).

(12) The phonetic interpretation of primary [dorsal]
1. A primary [dorsal] stop is velar.
2. A primary [dorsal] fricative is velar.
3. A primary [dorsal] vocoid is palatal.

The phonological features in (13) can be used to distinguish [dorsal] segments from one other.

(13) Features of the [dorsal] segments in JRA

	k	g	x	ɣ	j
[son]	-	-	-	-	+
[cont]	-	-	+	+	+
[voice]	-	+	-	+	+

The feature [guttural]

The feature [guttural] denotes 'those sounds having a constriction in the pharyngeo-laryngeal zone, i.e., in that part of the vocal tract which extends from the end of the oral cavity (i.e. the uvula) to the larynx' (Hayward and Hayward, 1989: 187-8). The [guttural] phonemes in JRA include the pharyngeal /ḥ, ʕ/ and the laryngeals /ʔ, h/. The pharyngealized coronals /ṣ, ḍ, ð̣, ṭ/ are assigned [+guttural] as a non-primary feature. The phonetic interpretation of the [guttural] phonemes are summed up in (14).

(14) The phonetic interpretation of [guttural] phonemes in JRA
1. A primary [guttural] stop is glottal.
2. A primary [guttural] fricative is pharyngeal or laryngeal.

The non-primary [guttural] is used to describe both pharyngealized phonemes and pharyngeals, as non-primary [guttural] describes general pharyngeal constriction. However, they differ in the degree and position of pharyngeal constriction: while pharyngeal constriction takes place in the upper pharynx in the case of pharyngealized phonemes, it is lower and closer to larynx in the pharyngeals (Watson, 2002). Accordingly, the JRA phonemes /ḥ/ and /ʕ/ are distinguished from the phonemes /ʔ/ and /h/ by having an additional non-primary [guttural] feature. The features in (15) can be used to differentiate between [guttural] phonemes in JRA.

(15) Features of [guttural] phonemes in JRA

	ḥ	ʕ	ʔ	h
[cont]	+	+	-	+
[voice]	-	+	-	-
[c.g.]	-	+	+	-
[guttural]*	+	+	-	-

The feature [guttural] is a non-primary feature for the phonemes /ḥ, ʕ/; it is used to distinguish between /ḥ/ and /h/. Having presented the phonological features assumed for the underlying specifications of the phonemes of JRA. I outline the main aspects of autosegmental phonology in the next section.

AUTOSEGMENTAL PHONOLOGY

The theory of Autosegmental Phonology was first introduced by Goldsmith (1976a) to handle tone systems of African languages. The view of autosegmental phonology is that tones, segments, and features are located on separate independent tiers, but they are coordinated by association lines. Autosegmental phonology has three main properties: First, a feature spreads from one anchor to another to capture assimilation in which a dashed association link is

used to represent such spreading (Hayes, 1986). Second, assimilation by spreading cannot produce representations in which association lines cross each other (Goldsmith, 1976a). Finally, a branching element is different from a succession of two identical linked elements in autosegmental phonology (Goldsmith, 1990). The theory was then used to deal with non-tonal features, such as nasal harmony in Guarani (Goldsmith, 1976b) and vowel harmony systems in the work of Clements (1977) and Vergnaud (1977, 1980).

A new version of the theory was then developed in the work of McCarthy (1979, 1981), Halle and Vergnaud (1980), Harris (1980), and Clements and Keyser (1980). In this version, a string of Cs and Vs appears on the segmental tier to encode information about the canonical pattern of a word while other features appear on separate tiers. McCarthy (1981: 384) provided a revision of Leben's (1973) Obligatory Contour Principle to fit his non-tonal data: 'A grammar is less highly valued to the extent that it contains representations in which there are adjacent identical elements on any autosegmental tier.'

Mohanan (1993) introduced the notion of dominance in assimilation. The view of this model is that an assimilatory situation is one in which two units have conflicting specifications with the specification of one dominating and thus overriding that of the other. Mohanan observed that certain phonological features are more dominant than others and dominance is linked to the position of trigger and undergoer. The onset is dominant with respect to the coda and the following element is dominant with respect to the preceding element. The smaller the domain is, the more likely it is for assimilation to occur. According to Mohanan's dominance scale, the velar sounds are the most dominant, palatals and labials are less dominant, and alveolar sounds are the least dominant.

MELODIC PROCESSES OF ASSIMILATION IN JRA

In this section, I analyse melodic processes of assimilation that occur in JRA.

Assimilation of t- of the Detransitivizing Prefix /ʔɪt-/

In JRA, *t-* of the detransitivizing prefix /ʔɪt-/ assimilates optionally to a following coronal sibilant and totally to a following coronal obstruent, as shown in (16).

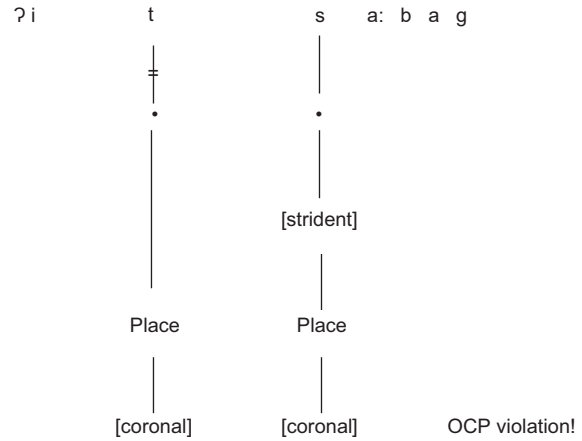
(16)	a)	/ʔɪt-+sa:bag/	ʔɪssa:bag ~ ʔɪtsa:bag	'raced'
		/ʔɪt-+ṣarraf/	ʔɪṣṣarraf ~ ʔɪtṣarraf	'managed'
		/ʔɪt-+ʃarʃaḥ/	ʔɪʃʃarʃaḥ ~ ʔɪtʃarʃaḥ	'got mistreated'
		/ʔɪt- + zawwaʤ/	ʔɪzzawwaʤ ~ ʔɪtzawwaʤ	'got angry with'
	b)	/ʔɪt-+ṭamman/	ʔɪṭṭamman	'got assured'
		/ʔɪt- + darrab/	ʔɪddarrab	'exercised/practiced'
		/ʔɪt- + ḍabḍab/	ʔɪḍḍabḍab	'got hidden'
		/ʔɪt- + ðalla/	ʔɪððallal	'got shaded'
		/ʔɪt- + θaqqaf/	ʔɪθθaqqaf	'got educated'
		/ʔɪt- + ða:baḥu/	ʔɪðða:baḥu	'were fighting'
		/ʔɪt- + ʤawwaz/	ʔɪʤʤawwaz	'got married'
		/ʔɪt- + ʧaðban/	ʔɪʧʧaðban	'told lies'

However, no assimilation takes place when *t-* is followed by a dorsal obstruent, a coronal sonorant, a labial or a guttural consonant, see (17).

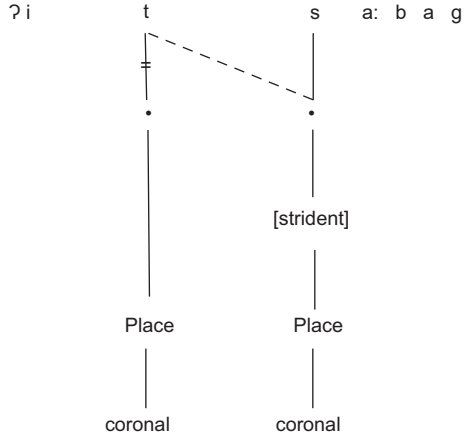
(17)	/ʔɪt- + kassar/	ʔɪtkassar	'got broken'
	/ʔɪt- + qallaṣ/	ʔɪtqallaṣ	'got shrunk'
	/ʔɪt- + gahwa/	ʔɪtgahwa	'drank coffee'
	/ʔɪt- + xazzan/	ʔɪtxazzan	'got saved'
	/ʔɪt- + ɣajjar/	ʔɪtɣajjar	'changed'
	/ʔɪt- + jabbas/	ʔɪtjabbas	'got dried'
	/ʔɪt- + naʕwas/	ʔɪtnaʕwas	'pretended to be sleepy'
	/ʔɪt- + lawwan/	ʔɪtlawwan	'got coloured'
	/ʔɪt- + rawwaḍ/	ʔɪtrawwaḍ	'got tamed'
	/ʔɪt- + bahdal/	ʔɪtbahdal	'got mistreated'
	/ʔɪt- + fa:xar/	ʔɪtfa:xar	'showed off'
	/ʔɪt- + marʤaḥ/	ʔɪtmarʤaḥ	'swung'
	/ʔɪt- + wassax/	ʔɪtwassax	'got dirty'
	/ʔɪt- + ʔa:mar/	ʔɪtʔa:mar	'organised conspiracy'
	/ʔɪt- + ʕallam/	ʔɪtʕallam	'learnt'
	/ʔɪt- + ha:wan/	ʔɪtha:wan	'be negligent'
	/ʔɪt- + ḥazwan/	ʔɪtḥazwan	'pretended to be sad'

The assimilation of *t-* to a following sibilant is represented in (18).

(18) (a) Deletion of leftmost root node



(b) Right-to-left spread of rightmost root node



As represented in (18), assimilation of *t-* of the detrasitivizing prefix *ʔit-* is motivated by an OCP violation on the [coronal] tier. The violation of the OCP is resolved by deletion of the leftmost root node with right-to-left spread of the rightmost root node.

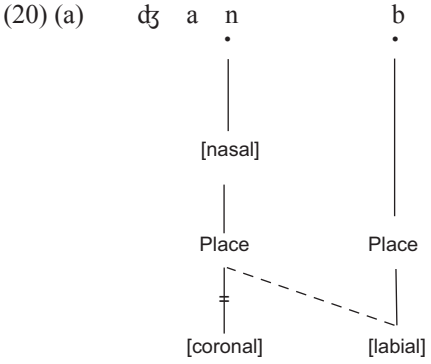
Nasal Place Assimilation

Nasal assimilation of place is obligatory within the phonological word in JRA when a nasal is followed immediately by a [labial] or [dorsal] consonant, as shown in (19 a). A clitic-final /n/ of /min/ 'from' assimilates in place to a following [labial] or [dorsal] consonant as well, see (19 b).

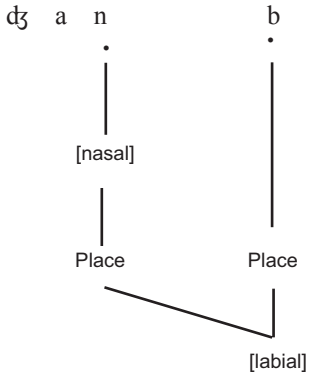
(19)	(a)	/ʤanb/	ʤamb	'side'
		/minfatiḥ/	mimfatiḥ	'open-minded'
		/maʃaːnku/	maʃaːŋkum	'for your sake'
		/mangu:l/	maŋgu:l	'got imparted'
	(b)	/minbarra/	mimbarra	'from outside'
		/minfo:g/	mimfo:g	'from above'
		/minmarra/	mimmarra	'not even once'
		/minkta:b/	miŋkta:b	'from a book'
		/mingabil/	miŋgabil	'before'

The representation of nasal place assimilation in the underlying JRA word /ʤanb/ 'side' is shown in (20).

(20) (a)



(b)



As represented in (20), the nasal consonant is weak in three terms: its position as a coda, being a preceding element rather than a following element, and being an alveolar. Accordingly, the primary place feature [labial] of the following consonant /b/ is dominant and thus it overrides the [coronal] feature of the nasal consonant by spreading from right to left, and the [coronal] feature is thus delinked.

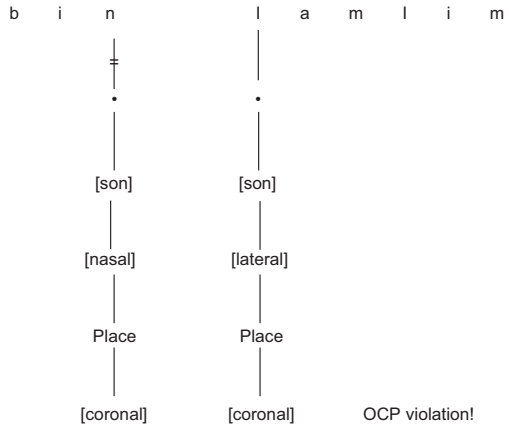
Coronal Sonorant Assimilation

In JRA the sonorant nasal /n/ assimilates totally to following /l/ or /r/ within the phonological word and /l/ assimilates totally to following /n/. However, /r/ fails to assimilate to following /n/ or /l/ as shown (21 a). Clitic-final /n/ assimilates totally to following /l/ or /r/ and clitic-final /l/ assimilates totally to following /n/ or /r/ in (21 b).

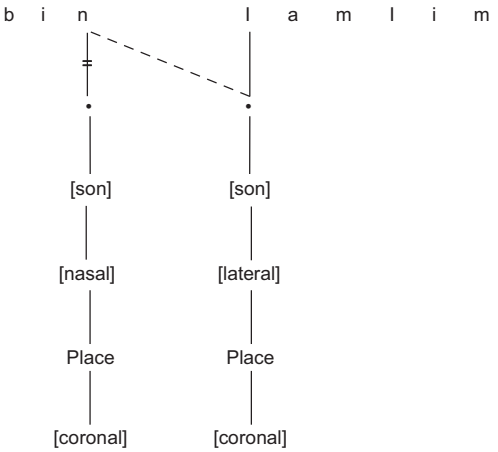
(21)	a)	/binlamlim/	billamlim	'are collecting'
		/binrattib/	birrattib	'are tidying'
		/gulna/	gunna	'we said'
		/maːlna/	maːnna	'what is up'
		/barnaːmiʤ/	barnaːmiʤ	'programme'
		/barlamaːn/	barlamaːn	'parliament'
	b)	/binlawwin/	billawwin	'we paint'
		/binruːḥ/	birruːḥ	'we go'
		/ʕalnoːm/	ʕannoːm	'go to bed'
		/ʕalraːs/	ʕarraːs	'on the head'

The following (22) is the representation of the phonological word /binlamlim/ 'are collecting' which is rendered as *billamlim* due to the total assimilation of /n/ to the following coronal sonorant /l/. This assimilation is motivated by the OCP violation on the coronal tier when adjacents agree in sonorancy. In response to this, the root node of the leftmost matrix is deleted, and the adjacent coronal sonorant helps fill up the vacuum created by deletion by right-to-left spread of the rightmost root node.

(22) (a) Deletion of leftmost root node



(b) Right-to-left spread of rightmost root node



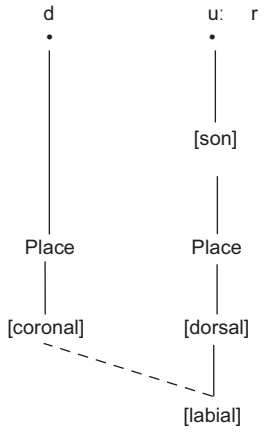
Anticipatory Labialization

JRA consonants are realized with partial lip rounding or lip protrusion when they are followed immediately by labial-velar vocoid /w/, /u/ or /u:/, see (23).

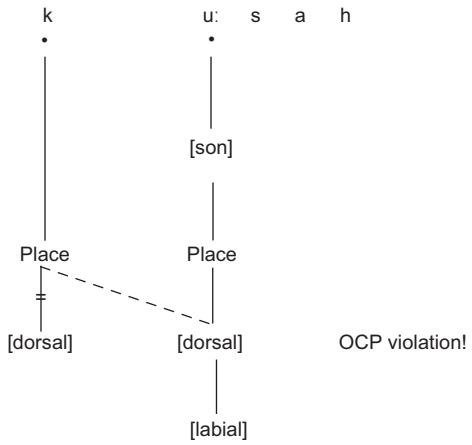
(23)	/du:r/	[d^w]u:r	‘houses’
	/bu:m/	[b^w]u:m	‘owl’
	/kurah/	[k^w]urah	‘ball’
	/ʃufit/	[$ʃ^w$]fit	‘I saw’
	/gulit/	[g^w]ulit	‘I said’
	/zurug/	[z^w]urug	‘blue’
	/ṣufur/	[$ṣ^w$]ufur	‘yellow’
	/ku:sah/	[k^w]u:sah	‘courgette’
	/kwajjis/	[k^w]wajjis	‘good’
	/lwa:ḥ/	[l^w]wa:ḥ	‘slabs’
	/rwa:b/	[r^w]wa:b	‘robes’

The assimilation of coronal /d/ to the following dorsal vocoid /u:/ in /du:r/ ‘houses’, for example, is motivated by right-to-left spread of non-primary [labial] in (24). However, the assimilation of dorsal /k/ in /ku:sah/ ‘courgette’ to following /u:/ is motivated by the OCP violation on the [dorsal] tier in (25).

(24)



(25)



The OCP violation on the [dorsal] tier is resolved by deleting the place feature below the place node and the rightmost place features are associated with the leftmost place node to fill up the empty place left by deletion of place feature in (25).

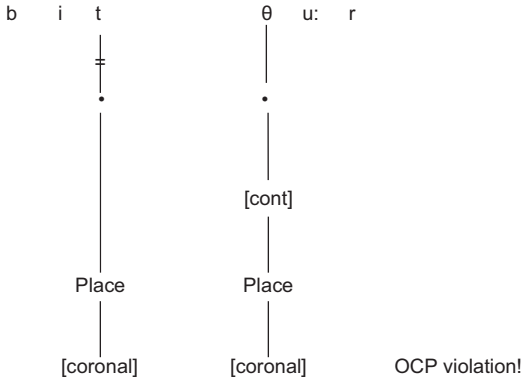
Inter-dentalization of Dentals

JRA dental consonants /t, d/ become inter-dentals when they are followed by an inter-dental consonant /θ, ð/ immediately either within a single word or across a word boundary, as shown in (26).

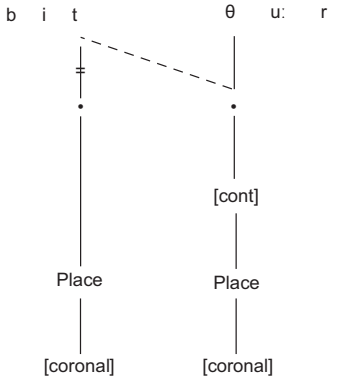
(26)	/bitθu:r/	bi[t̪]θu:r	‘to rebel’
	/madθu:r/	ma[d̪]θu:r	‘disappeared’
	/ʃufit θala:θi/	ʃufi[t̪] θala:θi	‘I saw three’
	/sadd ðajjig/	sa[d̪d̪] ðajjig	‘a narrow dam’

The dental consonant /t/ in the phrase /bitθu:r/ ‘to rebel’ becomes inter-dental as it is followed by the inter-dental consonant /θ/. This assimilation is motivated by the OCP violation on the [coronal] tier, as shown in (27).

27) (a) Deletion of leftmost root node



(b) Right-to-left spread of rightmost root node



The violation of the OCP on the [coronal] tier in (27) is resolved by deletion of the leftmost root node with right-to-left spread of the rightmost root node.

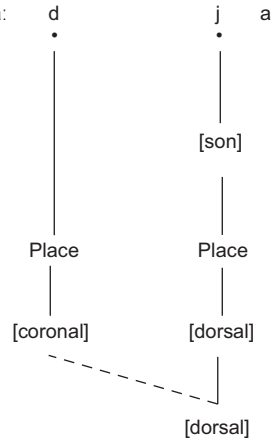
Palatalization of plosives

Palatalization of plosives /b, t, ṭ, d, ḍ, k, g, q, ʔ/ in JRA is partially triggered by a following palatal glide /j/ or a long mid vowel /e:/, as shown in (28).

(28)	/ʃa:dja/	ʃa:[d^j]ja	‘Shadya [a girl name]’
	/be:t/	[b^j]e:t	‘house’
	/binte:n/	bin[t^j]e:n	‘two girls’
	/mikja:ʤ/	mi[k^j]ja:ʤ	‘make-up’

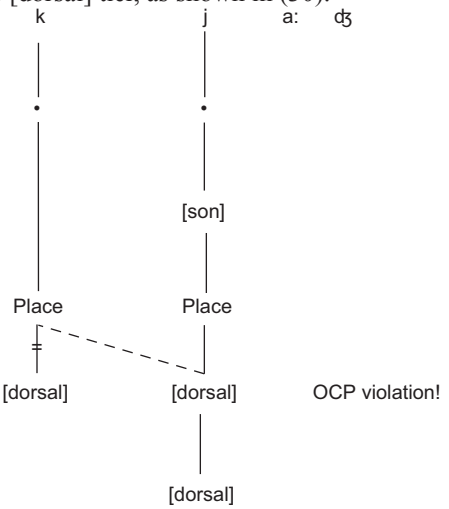
Both labial and coronal palatalization is motivated by spread of non-primary [dorsal] from a [dorsal] vocoid to a [labial] or [coronal] plosive, respectively, as represented in (29).

(29)



However, dorsal palatalization is motivated by an OCP violation on the [dorsal] tier, as shown in (30).

(30)



The OCP violation on the [dorsal] tier in (30) is resolved by delinking of the place feature [dorsal] and the empty space that is left by deletion of [dorsal] is filled by right-to-left spread of rightmost place features.

CONCLUSION

In this article I studied a set of melodic processes of assimilation in Jordanian rural Arabic; assimilation of /t/ of the detransitivizing prefix /ʔɪt-/, nasal place assimilation, coronal sonorant assimilation, anticipatory labialization, inter-dentalization of dentals, and palatalization of plosives. This study aimed at providing an autosegmental account of feature spread in assimilatory situations in JRA. I hypothesised that in any assimilatory situation in JRA the undergoer assimilates a whole or a portion of the matrix of the trigger. I also hypothesised that assimilation in JRA is motivated by violation of the OCP on a specific tier or by spread of a feature from a trigger to a compatible undergoer. Data were analysed in the framework of Mohanan's (1993) dominance model. Findings have revealed that there are two phonological factors that motivate assimilation in JRA: Firstly, violation of the OCP on the place tier. To resolve this violation, the place tier in the leftmost matrix is deleted and a feature spreads from rightmost matrix to leftmost matrix. Secondly, right-to-left spread of a primary or a non-primary feature from a trigger to an undergoer.

Findings have also revealed that an undergoer assimilates a whole or a portion of the matrix of a trigger as follows: the /t-/ of the detransitivizing prefix /ʔɪt-/ assimilates optionally to a following coronal sibilant and totally to a following coronal obstruent. However, no assimilation takes place when /t-/ is followed by a dorsal obstruent, a coronal sonorant, a labial or a guttural consonant. Nasal assimilation of place is partial and obligatory within the phonological word in JRA when a nasal is followed immediately by a [labial] or [dorsal] consonant. A clitic-final /n/ of /min/ 'from' assimilates in place to a following [labial] or [dorsal] consonant as well. The sonorant nasal /n/ assimilates totally to following /l/ or /r/ within the phonological word and /l/ assimilates totally to following /n/. However, /r/ fails to assimilate to following /n/ or /l/. Clitic-final /n/ assimilates totally to following /l/ or /r/ and clitic-final /l/ assimilates totally to following /n/ or /r/. JRA consonants are realized with partial lip rounding or lip protrusion when they are followed immediately by labial-velar vocoid /w/, /u/ or /uː/. Dental consonants /t, d/ become fully inter-dentals when they are followed by an inter-dental consonant /θ, ð/ immediately either within a single word or across a word boundary. Palatalization of plosives /b, t, ṭ, d, ḍ, k, g, q, ʔ/ in JRA is partially triggered by following /j/ or mid long /eː/.

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APPENDIX 1

List of Jordanian Rural Arabic Phonemic Symbols (adapted from Sa'aida, 2016, 14).

1. /t/: voiceless plain dental plosive.
2. /ṭ/: voiceless emphatic dental plosive.
3. /k/: voiceless velar plosive.
4. /g/: voiced velar plosive.
5. /q/: voiceless uvular plosive.
6. /ʔ/: voiceless glottal plosive.
7. /b/: voiced bilabial plosive.
8. /d/: voiced plain dental plosive.
9. /ḍ/: voiced emphatic dental plosive.
10. /f/: voiceless labiodental fricative.
11. /θ/: voiceless inter-dental fricative.
12. /ð/: voiced inter-dental fricative.
13. /s/: voiceless plain alveolar fricative.
14. /ṣ/: voiceless emphatic alveolar fricative.
15. /ʃ/: voiceless post-alveolar fricative.
16. /x/: voiceless velar fricative.
17. /ḥ/: voiceless pharyngeal fricative.
18. /h/: voiceless glottal fricative.
19. /z/: voiced plain alveolar fricative.
20. /ð̣/: voiced emphatic alveolar fricative.
21. /ʤ/: voiced post-alveolar fricative.
22. /ʧ/: voiceless post-alveolar fricative.
23. /ɣ/: voiced velar fricative.
24. /ʕ/: voiced pharyngeal varies between fricative and approximant.
25. /m/: bilabial nasal.
26. /n/: alveolar nasal.
27. /l/: alveolar lateral.
28. /r/: alveolar trill.
29. /w/: labial-velar glide.
30. /j/: palatal glide.
31. /i/: high front short vowel.
32. /u/: high back rounded short vowel.
33. /a/: low short vowel.
34. /iː/: high front long vowel.
35. /uː/: high back rounded long vowel.
36. /aː/: low long vowel.
37. /eː/: mid long vowel.
38. /oː/: mid back rounded long vowel.