

The Diminutive in Modern Standard Arabic: An Optimality Theoretical Analysis

LE DIMINUTIF DU STANDARD DE L'ARABE MODERNE: UNE ANALYSE THEORIQUE DE L'OPTIMALITE

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Abstract

The diminutive in Arabic has not received the attention it deserves in the literature. Most of the work done on Arabic morphology has viewed the derivation of Arabic diminutive as a simple process which maps root consonants, according to certain principles, onto well-defined positions of a diminutive pattern. In this paper, I will demonstrate that there is no need to refer to roots in the process of diminutive formation in Arabic. I will also show that under such a view a unified and comprehensive treatment of the diminutive is possible within the framework of Optimality Theory, as developed in Prince and Smolensky (1993). Following Benua (1997) and Ussishkin (1999), the analysis I argue for allows for a correspondence relation between the diminutive forms and the bases from which they are derived. However, my analysis goes beyond that presented in Benua (1997) and Ussishkin (1999) in that it assumes a similar correspondence relation between the diminutive forms and the input.

Key words: Optimality theory; Diminutive; Root; Base; Constraint

Résumé

Le diminutif d'Arabe n'a pas reçu l'attention qu'elle mérite dans la littérature. La plupart du travail effectué sur la morphologie arabe a vu la dérivation de l'arabe comme diminutif d'un processus simple qui associe consonnes radicales, selon certains principes, sur des positions bien définies d'un modèle diminutif. Dans cet article, je vais le démontrer qu'il n'y a pas besoin de se référer aux racines dans le processus de formation diminutif en

arabe. Je vais aussi montrer que, sous ce point de vue d'un traitement unifié et complet du diminutif est possible dans le cadre de la théorie de l'optimalité, telle que développée dans Prince et Smolensky (1993). Après Benua (1997) et Ussishkin (1999), l'analyse que je plaider en faveur d'une relation permet de correspondance entre les formes minuscules et des bases à partir desquelles elles sont dérivées. Cependant, mon analyse va au-delà qui sont présentées dans Benua (1997) et Ussishkin (1999) en ce qu'il suppose une relation de correspondance similaire entre les formes minuscules et l'entrée.

Mots clés: Théorie de l'optimalité; Diminutif; Racine; Base; Contrainte

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INTRODUCTION

The diminutive in Arabic has not received the attention it deserves in the literature. Most of the work done on Arabic morphology has viewed the derivation of the Arabic diminutive as a simple process which maps root consonants, according to certain principles, onto well-defined positions of a diminutive pattern. In this paper I will demonstrate that there is no need to adhere to ad hoc phonological rules in the process of diminutive formation in Arabic. I will also show that under such a view a unified and comprehensive treatment of the diminutive is possible within the framework of Optimality Theory as developed in Prince and Smolensky (1993). Following Benua (1997) and Ussishkin (1999), the analysis I argue for allows for a correspondence relation between the diminutive forms and the bases from which they are

derived. However, my analysis goes beyond that presented in Benua (1997) and Ussishkin (1999) in that it assumes a similar correspondence relation between the diminutive forms and the input.

The rest of the paper is organized as follows. In section 1, I provide a brief account of the studies so far conducted on the diminutive in Arabic. Section 2 will provide a thorough analysis of the diminutive in an OT framework. The constraints that are involved in the formation of the diminutive as well as their interactions will be the focus of most of the discussion. Following this discussion, the paper concludes in section 3.

1. DATA AND BASIC FACTS

Before proceeding to the discussion of the diminutive derivation within the framework of Optimality Theory, it is important to give the reader an account of how Arab grammarians have treated the process of diminutive formation in Arabic. Arab grammarians have viewed the diminutive formation as a productive process that is employed to express a variety of meanings some of which are (Shahiin, 1980; Saqal, 1996; Omer, *et al.*, 1984): smallness in size and number, contempt, endearment, and drawing near a time. Below are illustrative examples:

(1)

a. Smallness in number

Ishtara Aliun aθ-θawba bi khamsti durajhimat.
“Ali bought the dress for five drachmas.”

b. Smallness in size

Kanasat al-bint-u al-ħuḏajrata bil muknisati
“The girl swept the room with the broom.”

c. Contempt

Hatha ar-ruḏajlu la yaqumu bi wajibi baitih
“This little man does not take good care of his household.”

d. Endearment

Ya bunaj, asa 'lu an-najaħ-a min al-allahi
“O little son, I ask success from God.”

e. To draw near a (time)

Saa 'ti qubajla al-ḡisha'.

“I will come shortly before dinner.”

However, the formation of the diminutive in Arabic as a process per se has not engendered much theoretical discussion¹. The traditional analysis recognizes three major patterns for the diminutive (Al-Naleh, 1988; Al-Rajih, 1984; Omer, 1984; Thatcher, 1994).

The first major pattern is *fu ḡayl* and is used to derive the diminutives of trilateral non-diminutive forms. The noun *kalb*, for example, consists of three consonants and thus its diminutive form is *kulayb*. Consider more

illustrative examples in (2) below:

(2) <i>Non-diminutive</i>	<i>Diminutive</i>	<i>Gloss</i>
a. kalb	ku.lajb	“dog”
b. nahr	nu.hajr	“river”
c. qasr	qu.sajr	“palace”
d. batn	bu.tajn	“abdominal”
e. ra.ḏul	ru.ḏajl	“man”
f. ḏa.bal	ḏu.bajl	“mountain”
h. qa.mar	qu.majr	“moon”

The second pattern is *fu ḡayḡil* and is used to derive trisyllabic diminutives from quadrilateral non-diminutive forms (i.e., forms that consist of four consonants) with a short-vowelled second syllable. For example, the diminutive *durayhim* is derived from the quadrilateral base *dirham*. We present more illustrative examples below:

(3) <i>Non-diminutive</i>	<i>Diminutive</i>	<i>Gloss</i>
a. dir.ham	du.raj.him	“drachma”
b. ḏun.dub	ḏu.naj.dib	“grasshopper”
c. mas.ḏid	mu.saj.ḏid	“mosque”
d. ḡal.qam	ḡu.laj.qim	“bitterness”
e. Jaḡ.far	Ju.ḡaj.fir	“Jaḡfar” (proper name)

The third pattern is *fu ḡayḡiil* and is used to derive the diminutives of quadrilateral bases with a long-vowelled second syllable. *Sulajtiin*, for example, is derived from the quadrilateral base *sultaan* whose second syllable is long-vowelled. More illustrative data is below:

(4) <i>Non-diminutive</i>	<i>Diminutive</i>	<i>Gloss</i>
a. sul.taan	su.laj.tiin	“Sultaan”
b. mis.baah	mu.saj.biih	“lamp”
c. muf.taah	mu.faj.tiih	“key”
d. min.diil	mu.naj.diil	“handkerchief”
e. ḡas.fuur	ḡu.saj.fuur	“sparrow”

Note that in (3) and (4), the vowel length of the second syllable in the non-diminutive forms is preserved in the related diminutive forms. This tendency to preserve vowel length between the base and its related diminutive form suggests that the process of diminutive formation in Arabic is output-based. We will return to this issue in great detail later on.

Data in (5) below provides diminutive forms that do not follow the above patterns. These are treated in traditional analysis as exceptional (McCarthy, 1982).

(5) <i>Non-diminutive</i>	<i>Diminutive</i>	<i>Gloss</i>
a. šaa.ḡir	šu.waj.ḡir	“poet”
b. qaa.rib	qu.waj.rib	“boat”
c. baab	bu.wajb	“door”
d. naar	nu.wajr	“fire”
e. baħ.ra	bu.haj.ra	“pool”
f. ħu.ḏ.ra	ħu.ḏaj.ra	“room”
g. sal.ma	su.laj.ma	“Salma” (proper name)

¹Arabic here refers to Modern Standard Arabic which is a form of language that is found in the prose of books, newspapers, periodicals, and letters all throughout the Arab world. It is also used in public address, over radio and television, and in religious ceremonial.

It is worth noting here that the diminutive forms that have been treated exceptionally in the traditional account do have diminutive patterns that are as regular as the patterns we have discussed earlier. The diminutive forms in (5a-b), for example, are trisyllabic as are those in (3). However, they differ in having the epenthetic segment [w] that does not have a correspondent in the related non-diminutive forms. Another pattern that we recognize is represented by the forms in (5e-g). The non-diminutive forms are trilateral as those in (2). However, they do not have disyllabic diminutive forms as those in (2). Moreover, the last vowel of the bases is preserved in the related diminutive forms. We assume here that there is a general preference to preserve identity with the base as much as possible.

If the data above (2,3,and 4) offered only three patterns, we would have to conclude that the traditional analysis is systematic and that it correctly captures the formation of the diminutive in Arabic. However, this analysis has some drawbacks that can be easily noticed if we just have a look at the data in (5). It cannot explain, for example, why some of the diminutives have an extra segment: the labio-velar /w/. This segment is absent in the other diminutive forms. In addition, it cannot explain why some trilateral non-diminutive forms behave like quadrilateral non-diminutive forms in having trisyllabic diminutive forms.

In the next section, I present an analysis of the diminutive in Arabic within the framework of Optimality theory.

2. AN OT ANALYSIS

Instead we will find it more satisfying to look at the formation of the diminutive in Arabic as a matter of conflicting preferences. We will find how these conflicts will be resolved by comparing the actual outputs with potential outputs which might have come out if the priorities between preferences had been different. Below is an account of the Correspondence Theory which was developed within the framework of Optimality Theory (McCarthy & Prince, 1995) to account for correspondence relations between morphologically-related words. This theory will be the basis for my analysis of the diminutive in Arabic. I briefly introduce this theory in the following subsection.

2.1 The Correspondence Theory

McCarthy & Prince (1995) developed a general theory of correspondence to account for input-output faithfulness and base-reduplicant identity. The notion of correspondence is defined by McCarthy and Prince (1995) as follows:

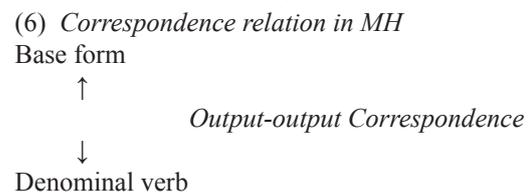
Given two strings S_1 and S_2 , related to one another as input-output, base-reduplicant, etc., correspondence is a relation \mathfrak{R} from the elements of S_1 to those of S_2 . Elements $\alpha \in S_1$ and $\beta \in$

S_2 are referred to as correspondents of one another when $\alpha \mathfrak{R} \beta$ (p. 262)

Similar to the relations that hold between inputs and outputs and reduplicants and their bases of reduplication, Correspondence Theory motivates correspondence relations between surface forms. This type of correspondence has been referred to as output-output correspondence. The O-O correspondence has been adopted by Benua (1997) in her analysis of the truncation process in Tiberian Hebrew and the Austronesian language Sundanese. She proposes that the base outputs are the inputs for the truncated words. The claim is that words that are morphologically-related must be phonologically identical by ranked and violable constraints. Constraints on output-output correspondence relations set up the pressure under which a derived word deviates from the surface patterns of the language in order to achieve base-identity. While the truncated words in Sundanese tend to overapply, the truncated words in Tiberian Hebrew demonstrate underapplication to preserve full Phonological identity with the base. Benua concludes that the pressure to achieve phonological identity in both cases results in the emergence of marked structures in the surface forms.

Ussishkin (1999) also applies the model of Correspondence to the process of denominal verb formation in Modern Hebrew (MH). He assumes that the denominal verbs in MH are dependent on base outputs for their formation. These outputs are canonical surface forms that already exist in the language. He provides several empirical observations to support his assumption. First, he observes that there is a kind of correspondence between the vowel of a base and the second consonant of its related denominal verbs. Moreover, consonant clusters in some bases tend to be preserved in the related denominal verbs.

Ussishkin relies on the following schema to account for this type of correspondence between the bases and their related denominal verbs:



Following Benua (1997) and Ussishkin (1999), I assume that the formation of the diminutive in Arabic is an output-based process. The claim is that the diminutive forms are derived from bases that exist as independent words (typically nouns) in the language. This assumption is supported by the fact that part of the base is preserved in the related diminutive form. I repeat relevant data below (7):

(7) <i>Base</i>	<i>Related diminutive form</i>	<i>Gloss</i>
a. baħ.ra	bu.ħaj.ra	“pool”
b. šaʕ.ra	šu.ʕaj.ra	“hair”

c. huʒ.ra	hu.ʒaj.ra	“room”
d.Sal.ma	su.laj.ma	“Salma”

All the bases above end with the low vowel [a]. This vowel is preserved in the related diminutive forms. Further evidence for the base-output correspondence comes from the fact that the lengthening pattern that we see in disyllabic bases is maintained in the related diminutive forms. We repeat the relevant data below (8):

(8) Base	Related diminutive form	Gloss
a.sul.taan	su.laj.tiin	“sultan”
b.min.diil	mu.naj.diil	“handkerchief”

We conclude that there is a correspondence relation between the diminutive forms and the bases from which they are derived.

2.2 The Input to Diminutive Formation

We have established earlier that part of the base is present in the diminutive. Following Benua (1997) and Ussishkin (1999), I further assume that the entire base is taken as input to the formation of the diminutive in Arabic. In addition to the base, I propose that the input to diminutive formation involves the consonantal root and what Arab grammarians referred to as “*dam*” the first consonant of the base (du), “*fath*” the second consonant (da) and the insertion of [j] after it². From a base like *kalb*, for example, the diminutive form *kulayb* can be derived as follows:

1. Dam the first consonant
[kalb] ----->/kulb/
2. Fath the second syllable
/kulb/ --->/ kulab/
3. Inserting [j] after the second consonant
/kulab/ ---> [kulajb]

The analysis I argue for allows not only for a correspondence relation between the diminutive forms and the bases but also between the diminutive forms and the input. The correspondence model for diminutive formation is presented below:

	<i>Input Base</i>	
<i>I-O Correspondence</i>	↓ ↓	<i>O-O correspondence</i>
	<i>Diminutive Form</i>	

According to the schema presented above, the diminutive formation in Arabic involves an interaction between input-output faithfulness constraints and base-identity constraints. The input-output faithfulness constraints require that the input segments be preserved in the output. Base-identity constraints require that the output and the base be identical in some respect.

Before proceeding to the discussion of how this model operates, it is important to repeat the relevant data organized on the basis of their significance to the analysis:

(9)Base	Diminutive	Gloss
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a. kalb	ku.lajb	“dog”
b. nahr	nu.hajr	“river”
c. qasr	qu.sajr	“palace”

The diminutive forms above represent straightforward cases of diminutive formation.

(10)Base	Diminutive	Gloss
a. baħ.ra	bu.ħaj.ra	“pool”
b.ša ʕ.ra	šu.ʕaj.ra	“hair”
c.huʒ.ra	hu.ʒaj.ra	“room”

All the diminutive forms in (10) have bases that end with the low vowel [a]. We assume that this vowel is preserved in the diminutive forms. This is supported by the fact that the affixal vowels of the input /u a/ are already mapped onto the output and thus the last [a] is part of the base and not of the input.

(11)Base	Diminutive	Gloss
a.dir.ham	du.raj.him	“drachma”
b.ʒun.dub	ʒu.naj.dib	“grasshopper”
c.mas.ʒid	mu.saj.ʒid	“mosque”

(12)Base	Diminutive	Gloss
a.saa.hib	su.waj.hib	“friend”
b.šaa.ʕir	šu.waj.ʕir	“poet”
c.qaa.rib	qu.waj.rib	“boat”

The diminutive forms in (12) have the epenthetic segment [w] which has no correspondent in the related bases. The motivation behind the epenthesis of [w] and what determines the quality of the epenthetic segment are issues that will be addressed in section (2.4) below.

(13)Base	Diminutive	Gloss
a.sul.taan	su.laj.tiin	“sultan”
b.mis.baaħ	mu.saj.biiħ	“lamp”
c. muf.taah	mu.faj.tiiħ	“key”

As the data above shows, the vowels and /j/ are invariable, appearing in all diminutive forms. The consonants of the base are also preserved in the outputs. In (9), the bases are all monosyllabic and their diminutive forms are disyllabic. In (10-12), trisyllabic diminutive forms are derived from disyllabic bases.

2.3 Analysis

We have established earlier that /u a j/ + consonantal root constitute part of the input to the formation of the diminutive in Arabic. It follows that every input segment must have a correspondent in the output. The constraint that enforces the preservation of input segments in the output is Maximality-IO (or Max-IO):

(14) **MAX-IO** (McCarthy & Prince, 1995)

Input segments must have output correspondents. (“No deletion”)

This constraint is violated by any input segment that lacks a correspondent in the output. The preference to satisfy MAX-IO sets up the pressure under which DEP-

² There are three vowel signs in Arabic: fatha which is a small diagonal stroke over a consonant (da), kasra which is a small stroke diagonal under a consonant (di) and damma which is a small ʾ above the consonant (du). They are used to express the vowels a, i, u, respectively (cf. Thatcher 1993).

BO may be violated:

(15) **DEP-BO** (McCarthy & Prince, 1995, p.370)

Every element in the output has a correspondent in the base.

(“No epenthesis”)

Accordingly, it must dominate DEP-BO:

(16) **MAX-IO >> DEP-BO**

These constraints preserve segment correspondence and not featural identity. We therefore have to add another correspondence constraint (IDENT-IO) to the set of constraints listed so far to prevent any change in features. The correspondence constraint that militates against featural change is IDENT-IO:

(17) **IDENT-IO**

Any correspondent of an input segment specified as F must be F.

Since this constraint forces identical feature specifications between corresponding segments, it is never violated in the diminutive forms. We therefore add it to the set of undominated constraints:

Tableau (18) below tests the correctness of this ranking.

Following OT practice, the optimal candidate is indicated by “☞”, and fatal violations of constraints are indicated by “*!”. Higher- ranking constraints appear to the left, and a solid line between the constraints is used to indicate a dominance relation between them.

Tableau (18)

Input: /u a j / + /k l b/ Base [kalb]	MAX-IO	IDENT-IO	DEP-BO
a. kalb	*! **		
b. kulb	*! *		*
☞ c. ku.lajb			***
⊗ d. kul.baj			***
e. ku.lijb		*!	***
⊗ f. kul.ajb			***

Let us examine our first tableau. The tableau demonstrates that each of candidates (18a-b) violates MAX-IO severely. The optimal candidate (18c) incurs the same number of violations of DEP-BO as do candidates (18d) and (18f). A crucial question that must be addressed now is how to end the competition between the optimal candidate (18c) and the sub-optimal candidates (18d) and (18f). My solution to this problem involves two constraints: the first blocks deletion at the edge of a grammatical word and the second enforces syllabic well-formedness. The constraint that requires correspondence between two landmarks in the base and output is known as ANCHORING. McCarthy & Prince (1995) define ANCHOR as follows:

(19) **{RIGHT, LEFT}-ANCHOR (S₁, S₂)**

Any element at the designated periphery of S₁ has a correspondent at the designated periphery of S₂.

Let Edge (X, {L,R}) = the element standing at the Edge= L,R of X.

RIGHT-ANCHOR. IF x = Edge (S₁, R) and y = Edge (S₂, R) then x ≍ y.

LEFT-ANCHOR. IF x = Edge (S₁, L) and y = Edge (S₂, L) then x ≍ y.

We need this constraint to ensure that the initial (or final) segment of the output coincides with the initial (or final) segment of the base. Therefore, our version of this constraint is ANCHOR-BO:

(20) **ANCHOR-BO** (Kager, 1999, p.213)

Correspondence preserves alignment in the following sense: the left (right) peripheral element of O(utput) corresponds to the left (right) peripheral element of B(ase), if O is to the left (right) of B (Kager 1999).

Candidate (18d) above violates ANCHOR-BO since the rightmost segment of the output, the [j], fails to correspond to the rightmost segment of the base, the [b]. We expect this constraint to be inviolable and thus high-ranking because it has to be satisfied by all the optimal candidates. Adding it to the set of constraints discussed so far will result in the following sub-ranking³:

(21) **ANCHOR-BO, MAX-IO, IDENT-IO >> DEP-BO**

The second constraint that preserves syllabic well-formedness is expressed in the structural well-formedness constraint ONSET (Itô 1989, Prince and Smolensky 1993). We can now add this constraint to our set of constraints in order to account for the data:

(22) **ONSET**

*C] σ (‘Syllables must have onsets’)

We expect ONSET to be highly- ranked because it will be inviolable by all the optimal candidates.

Our new ranking is:

(23) **ONSET, ANCHOR-BO, MAX-IO, IDENT-IO >> DEP-BO**

Tableau (24) below confirms our assumption.

³ Having MAX-IO outranking ANCHOR-BO cannot predict the optimal candidate from a base of the form *cvc* (is it *cuwajc* or *cucay*?). Since *cvc* is not an attested base in the language, we do not know the right form. Therefore, we do not have a testing ground for this ranking.

Tableau (24)

Input / u a j/+ /k l b/ Base [kalb]	ONSET	ANCHOR-BO	MAX-IO	IDENT-IO	DEP-BO
a. kalb			*!***		
b. kulb			*!*		*
☞ c. ku.lajb					***
d. kul.baj		*!			***
e. ku.lijb				*!	***
f. kul.ajb	*!				***

The tableau above demonstrates clearly that candidate (24d) is no longer in competition with the optimal candidate (24c) as it incurs a fatal violation of ANCHOR-BO. Similarly, the conflict between the optimal candidate (24d) and the sub-optimal candidate (24f) is resolved at

the expense of a fatal violation of ONSET in candidate (24f).

The next question that needs to be addressed is whether our present ranking accounts for the rest of the data. Tableau (25) below answers this question.

Tableau (25)

Input / u a j/+ / š r/ Base [ša ʕra]	ONSET	ANCHOR-BO	MAX-IO	IDENT-IO	DEP-BO
a. ša ʕ.ra			*!***		
☞ b. šu.ʕaj.ra					***
c. ša.ʕaj.ra			*!		**
d. šu.ʕajr		*!			***
⊗ e. ša.ʕu.ra.ja					***
f. ši.ʕuj.ra				*!	***
g. . šuʕ.aj.ra	*!				
h. šu.ʕaja			*!		***

Apparently, our ranking does not account yet for all the data. Candidates (25a) and (25c) cause no problem as each one of them fatally violates MAX-IO. The same case applies to candidate (25d) which incurs a fatal violation of ANCHOR-BO. Candidate (25e) is identical in its pattern of violation marks to the optimal candidate (25b). Therefore, our ranking needs to be modified in order to end the tug of war between the optimal candidate and the

sub-optimal one. To rule out candidate (25e), we need a constraint that makes sure that the segments of the input appear “leftmost” in the output:

(26) **ALIGN –DIM-L** (Kager, 1999, p.226)

Align the left edge of the diminutive with the left edge of the PrWd.

The activity of ALIGN-DIM-L in keeping [u a j] leftmost in the word is illustrated by tableau (27).

Tableau (27)

Input / u a j/+ / š r/ Base [ša ʕra]	ONSET	ALIGN-DIM-L	ANCHOR-BO	MAX-IO	IDENT-IO	DEP-BO
a. ša ʕ .ra				*!***		
☞ b. šu.ʕaj.ra						***
c. ša.ʕaj. ra				*!		**
d. šu.ʕ ajr			*!			***
e. ša.ʕu.ra.ja		*!				***
f. ši.ʕaj.ra					*!	***
g. . šu ʕ.aj.ra	*!					
h. šu.aja				*!		***

Perhaps the most interesting and curious case involves diminutive forms with epenthetic /w/ which we repeat below:

- (28)
- | | | |
|------------|------------|----------|
| (a)baab | bu.wajb | “door” |
| (b)ʕaaʒ | ʕu.wajʒ | “ivory” |
| (c)maal | mu.wajl | “money” |
| (d)raas | ru.wajs | “head” |
| (e)ʕaa.ʕir | ʕu.waj.ʕir | “poet” |
| (f)qaa.rib | qu.waj.rib | “boat” |
| (g)saa.hib | su.waj.hib | “friend” |
| (h)kaa.tib | ku.waj.tib | “writer” |

As shown in the data above, all the bases with [aa] surface with [w] in their related diminutive forms. We assume that the presence of the epenthetic segment is

strictly required to minimize the violation of syllabic well-formedness. That is to say, it is required to preserve a language-specific ‘syllable template’. This template requires an obligatory onset: there is a sequence of two vowels (hiatus), namely [u] and [a] in the sub-optimal candidate, without an intervening consonant, whereas the syllable template requires an obligatory onset. The empty onset position needs to be filled and the segment to fill the position has to be pronounceable at the end of the derivation. In our case, the empty onset position is filled by [w]. The requirement for syllables to have an obligatory onset is expressed in the structural well-formedness constraint ONSET which we previously introduced. Tableau (29) illustrates our previous assumption concerning epenthetic [w]:

Tableau (29)

Input:/u a j/ + / m l/ Base[maal]	ONSET	ALIGN-DIM-L	ANCHOR-BO	MAX-IO	IDENT-IO	DEP-BO
a. maal				*! **		
☞ b. mu.wajl						****
⊗ c. mu.ʔayj						****
d. mu.aɣl	*!					***
e. mu.lay			*!			
f. mi.wayl					*!	***

Notice that candidate (29c) has the glottal stop [ʔ] instead of the glide [w]. However, it satisfies the syllabic well-formedness constraint and emerges as the incorrect winner. We are thus in need of a constraint that prevents the epenthetic segment from having independent place features of its own. This issue will be discussed in the next subsection.

2.4 The Quality of the Epenthetic Segment

This subsection discusses the forces that determine the quality of the epenthetic segment in the diminutive forms in (27) above. We follow Watson (2002) and Uffmann (2002), and propose that the nature of the epenthetic segment and accordingly its features are to be provided by

spreading the values of the leftmost vowel. What happens above is a case of feature harmony where the epenthetic segment and the preceding vowel harmonize for the feature [back]. The question that needs to be addressed here is how to account for that in OT? We need a constraint that requires that the least expensive epenthetic segment to be inserted:

(30) **DEP-PL(ACE)**

An epenthetic segment must not have independent place features of its own.

We add this constraint to our set of undominated constraints. To test its activity, we repeat tableau (29) as (31):

Tableau (31)

Input:/u a j/ + / m l/ Base[maal]	ONSET	ALIGN-DIM-L	ANCHOR-BO	MAX-	IDENT-IO	DEP-PL(ACE)	DEP-BO
a. maal				*! **			
☞ b. mu.wajl							****
c. mu.ʔayj						*!	****
d. mu.aɣl	*!						***
e. mu.lay			*!				
f. mi.wayl					*!		***

This situation derives us to say that the epenthetic candidate (31b) above is more harmonic than the non-epenthetic candidate (31c) and thus is chosen as the optimal candidate.

However, the account provided so far does not explain why the diminutive forms (27e-h) require the epenthesis of /w/. The related diminutive form of *qaarib*, for example, is *quwajrib* rather than *qurajb*. Why can we not just map /u a j/ and have *qurajb* as the diminutive form of *qaarib*? Given the fact that base-identity must be preserved in the diminutive form in some respect, it is logical to assume that /u a j/ must be mapped onto

the diminutive form as close as possible in order to compensate for a long deleted vowel. The assumption is that /u a j/ have to be sandwiched between the first two consonants of the diminutive form in order to compensate for this feature. This results in a sequence of two vowels without an intervening consonant (hiatus). Since the syllable template requires an obligatory onset, /w/ will be inserted.

The second bomb to throw on the current ranking will be to try to see if it also accounts for the data in (13) above. Tableau (32) will answer this question:

Tableau(32)

Input:/u a j/ + /sltn/ Base[sul.taan]	ONSET	ALIGN-DIM-L	ANCHOR-BO	MAX-IO	IDENT-IO	DEP-PL(ACE)	DEP-BO
a. sul.taan				*! **			
☞ b. su.laj.tiin							****
c. sul.aj.tiin	*!						***
⊗ d. su.laj.taan							***
e. sa.laj.tiin					*!		***

It seems that we still have something missing in our ranking because candidate (32b) is supposed to be the optimal candidate and yet it has the same number of violations of DEP-BO as candidate (32d). Therefore, we are still in need of another constraint to end the conflict between them. This constraint should account for the difference between the optimal candidate and its strong competitor. The resolution of the conflict between the optimal candidate and candidate (32d) will be offered in the next subsection.

2.5 Emergence of the Unmarked

The optimal candidate (32b) above diverges from the base in the quality of its last vowel. This divergence results in what McCarthy and Prince (1994) refer to as “*emergence of the unmarked*”. The final vowel of the output is the featurally unmarked [i]. According to Kager (1999), featurally unmarked vowels like [i] result when a markedness constraint jumps into activity in special situations where faithfulness constraints are not dominant. The markedness constraint that is responsible for the

emergence of [i] in the diminutive is defined below.

(33) **V (-back)**

Vowels must be [-back].

The general faithfulness constraint that militates against such a constraint is:

(34) **IDENT-BO (back)**

Let α be a segment in the base, and β be a correspondent of α in the output. If α is

[γ back], then is β [γ back].

For unmarked vowels to arise in the diminutive, the markedness constraint V (-back) must dominate the identity constraint IDENT-BO (back), requiring identity between the base and the output for the feature [back]. The overall constraint hierarchy developed so far can be summarized as follows:

(35) **ONSET, ANCHOR-BO, MAX-IO, IDENT-IO, DEP-PL (ACE)>> V (-back)>> IDENT-BO (back)>> DEP-BO**

Tableau (36) below confirms our assumptions.

Tableau (36)

Tableau (36)

Input:/u a j/ + / sltn/ Base[sul.taan]	ONSET	A L I G N - DIM-L	A N C H O R - BO	MAX-IO	I D E N T - IO	DEP-PL(ACE)	V (-back)	I D E N T - BO(back)	DEP-BO
a. sul.taan				*! **					
☞ b. su.laj.tiin							**	*	***
c. sul.aj.tiin	*!							*	***
d. su.laj.taan							***!		***
e. sa.laj.tiin					*!			*	***
g. sa.lu.tayn		*!					***		***

The tableau above confirms our final ranking. Candidate (36c) incurs a fatal violation of the undominated constraint ONSET and thus is ruled out. Since candidate

(36d) violates V (-back) more than necessary , it is no longer competing with the optimal candidate (36b). Our final ranking is also confirmed by tableau (37) below:

Tableau (37)

Input/u a j/+ /drhm/ Base [dirham]	ONSET	ALIGN-DIM-L	ANCHOR-BO	MAX-IO	I D E N T - IO	DEP- PL(ACE)	V (-back)	I D E N T - BO(back)	DEP-BO
a. dir.ham				*! **			*		
☞ b. du.raj.him							**	*	***
c. dur.ham				*! *			**		*
d. dur.aj.ham	*!						***		***
e. dur.aj.him	*!							*	***
f. da.raj.him					*!			*	**
g. dur.ajh.im	*! *						**	*	***
h. di.ru.hajm		*!					**		***
i. du.rajm				*!			**		***

Each of the non-optimal outputs in the above tableau incurs a fatal violation of one of the top ranking constraints. For example, the outputs (37 d-e) and (39g) violate the constraint requiring each syllable to have an onset. Candidates (37a) and (37c) each fatally violates MAX-IO. Satisfaction of the high-ranked constraints comes at the expense of preserving identity with the base in the optimal candidate (37b) which incurs three fatal violations of DEP-BO.

We conclude that our final ranking accounts for all the data under study. This conclusion lends further support to Optimality theory as it provides a comprehensive and unified treatment of the diminutive in Arabic. We have demonstrated that the diminutive in Arabic is the product of an interaction between markedness and faithfulness constraints rather than the application of a set of ad hoc phonological rules.

CONCLUSION

On the basis of the above discussion we conclude that the formation of the diminutive in Arabic involves an interaction between well-formedness and faithfulness constraints. We have demonstrated that the costs of inserting a non-underlying segment are less than those of imperfect syllable structure. We have also argued for the fact that there is a relation of correspondence between bases and their related diminutive forms and that the entire base is part of the input to the diminutive formation. The argument was supported by empirical observations as well as empirical studies. The discussion has made it clear that the diminutive cannot be formed on the basis of a fixed pattern because this would result in the loss of significant phonetic material and thus obscuring the connection between the base and the diminutive.

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