Templatic Imposition in Language Games

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Botne and Davis (2000:320) make a novel distinction between insertion-type and imposition-type language games arguing against insertion of a template, McCarthy (1982), which they analyze as an imposition of a prespecified consonant on a vocalic peak rendering autosegmental spreading unnecessary. This paper comes in support of the notion of imposition-type games departing from Botne and Davis's analysis in arguing for the necessity of the template and autosegmental spreading: in a language game in Arabic, a template made up of a pre-specified consonant followed by two unspecified moras is imposed on the first mora of each syllable. The unspecified moras of the template are filled either by an existing nucleus or by a process of consonant spreading creating a geminate consonant in the syllable. Accordingly, Botne and Davis's analysis of segment imposition is reanalyzed as an imposition of a mono-moraic template.

Keywords: *language games, imposition, template, Arabic.*

1. Introduction

Botne and Davis (2000:319) state that:

> Language games in which the phonological forms of words are systematically altered have been well-studied from a typological perspective. The two most common types of language games entail the transposition of phonological constituents (usually syllables) and the addition of phonemes at one or more locations within the word.

In transposition-type games, syllables are moved from one place to another within the word, providing evidence for the reality of the syllable as a phonological unit and the nature of syllabification in a given language. The initial and final syllables or the final two syllables may be transposed as in Tagalog (1) and the *kinshingelo* game[i] in Sanga (2) respectively[ii].

(1) Tagalog [Conklin 1956]
kapatid ⟶ tidpaka 'sibling'

(2) Sanga [Kenstowicz and Kisseberth 1979]
óbé múkwèètù twááyáá kú múkólá ⟶ béó mútùùkwè yáátwáá kú múlákó

'Toi, mon compagnon, viens avec moi à la rivière!'

'You, my friend, come with me to the stream!'

Language games that involve an addition of phonemes are of two categories. In the first, phonemes are added to different parts of the word. Such games are called insertion-type games as in Hausa, German, and Indonesian (3-5 respectively):

(3) Hausa [Alidou 1997]
tsíntsíyáa ⟶ dá-tsín-dà-tsìi-dà-yáa 'broom'

(4) German [Pound 1963]
knabe ⟶ kná-bi-bé-bi 'boy'

(5) Indonesian [Pound 1963]
kasakóla ⟶ kasakol-árk-a 'school'

The insertion may be a prefix as in Hausa, a suffix as in German, or an infix as in Indonesian to one or more syllables within a word. The infix is usually after a syllable onset or between moras. The second category involves the insertion of a CV-template after each vowel in the word. The inserted consonant is usually prespecified, while the vowel results from the spreading of the preceding vowel. Examples of such language games are found in Hungarian [Pound 1963] and Spanish [Davis 1993], as shown in (6) and (7) respectively:

(6) soha ⟶ so-vo-ha-va 'never'

(7) grande ⟶ gra-fa-nde-fe 'big'

1.1. *Language games in Arabic:*

Language games in Arabic have been well documented. Hijaazi and Moroccan Arabic, in particular, have been extensively researched. Language games in these two varieties have been used as evidence for the reality of the triliteral root consonants to native speakers (al-Mozainy, 1982). Games based on consonant permutation only involve permutation of the root consonants while affixes remain in their original positions, as shown in (8):

(8) root-consonant permutation in Hijaazi Arabic[iii]

a.	b.	c.
difaʕ-na	iħtaram	darras-na
daʕaf-na	iħtimar	dassar-na
fidaʕ-na	irtiħam	raddas-na
faʕad-na	irtimaħ	rassad-na
ʕafad-na	imtaraħ	sadder-na
ʕadaf-na	imtaħar	sarrad-na
'we paid'	'to respect'	'we taught'

Al-Mozainy (1982) provides explanation for the differences in the vowels in (8a.) that does not affect the overall behavior of the language game.

Other language games have been reported as well: in Lebanese Arabic, /za/ is prefixed to the word while Iraqi Arabic prefixes /sV/, where the vowel is determined by the following syllable (Pound 1963). Burling (1970) documents a Cairene Arabic language game in which the syllable /tin/ is infixed within the nucleus of the penultimate syllable. Walter (2002) documents a language game in Yemen where /aarb/ is inserted before the stressed vowel of each word. Finally, Bakalla (2002) documents a similar language game in Meccan Arabic where a long vowel followed by /rb/ is inserted before the stressed syllable of the word. The long vowel is satisfied through a process of vowel spreading, as shown in (9):

(9) Meccan Arabic[iv]

a. fil	fiirbiil	'elephant'
fuul	fuurbuul	'beans'
gaal	gaarbaal	'he said'
b. aħmad	aarbaħmad	'Ahmad'
qurʔaan	qurʔaarbaan	'Koran'
hina	hiirbina	'here'
c. aħtaram[v]	aħtaarbaram	'he respected'
altagaah	altagaarbaah	'he found it'
gaabalu	gaarbaabalu	'he met him'

This game differs from that found in Yemen in that Yemeni Arabic invariably inserts /aa-/, while in Meccan Arabic, the quality of the vowel is determined by the vowel in the stressed syllable. Both games, however, use the same consonants and make direct reference to stressed syllables. Data in (9), repeated in (10), exemplify the Yemeni game.

(10) Yemeni Arabic

a. fiil	faarbiil	'elephant'
fuul	faarbuul	'beans'
gaal	gaarbaal	'he said'
b. aħmad	aarbaħmad	'Ahmad'
qurʔaan	qurʔaarbaan	'Koran'
hina	haarbina	'here'
c. aħtaram	aħtaarbaram	'he respected'
altagaah	altagaarbaah	'he found it'
gaabalu	gaarbaabalu	'he met him'

The Meccan language game is of special interest to the current discussion since it will be analyzed as an imposition-type game involving the imposition of a bimoraic template similar to

the argument presented for the Jordanian language game with differences that are typologically significant. The Yemeni game, however, is a classic case of an insertion-type game.

1.2 *Imposition-type games*

Botne and Davis (2000:320) make a novel distinction between insertion-type games and imposition-type games. They argue that in imposition-type games, a consonant articulation is imposed on the prosodic peak of the vocalic gesture. The imposed consonant splits the vocalic gesture into two vowels. Each of these vowels will belong to a different syllable creating what Fujimura (1979), Fujimura and Lovins (1982), and Clements (1988, 1990) analyze as two demisyllables[vi]. The demisyllable, according to Fujimura (1979), Fujimura and Lovins (1982), is a gestural/acoustic notion. The first demisyllable is made up of the initial consonant(s) plus the vocalic peak and it reflects the transition from the beginning of the syllable into the vowel steady state. The second demisyllable is made up of the vocalic peak plus any syllable final consonant(s), and it reflects the transition out of the steady state vowel. Accordingly, the two demisyllables in the English word /feet/ are shown in (11):

(11) Demisyllables in the word 'feet':

fiit ⟶ fi + iit

An imposition-type game would impose a consonant between these two demisyllables.

Botne and Davis further divide languages into syllable-prominent and mora-prominent languages. In the former, consonant imposition splits the vocalic peak, which may be the first or second mora of a diphthong. Consider, for example, the Spanish language game in (12) where the imposed consonant /f/ splits the first part of the diphthong in (12a, b) while it splits the second part of the diphthong in (12c). The difference is that in (12a, b), the peak of the diphthong is the initial part while it is the second part in (12c).

(12) Spanish f-imposition

a. hoi	⟶	hofoi	'today'
b. baile	⟶	bafailefe	'dance'
c. fʊe	⟶	fʊefe	'went (3rd pers.)'

On the other hand, mora-prominent languages involve an imposition of a consonant on every mora in the syllable. Such is the case in Japanese, where /b/ is imposed on every mora of the diphthong in the word /hai/ 'yes' as exemplified in (13).

(13) Japanese b-imposition

Word	Demi-moras	b-imposition
hai	h a a i i	habaibi

The rest of this paper is organized as follows. Section 2 lays down the rules of the language game under investigation. This game is called [lʊɣat ʕal−ʔaSafiir] 'Bird Language (BL)'[vii]. Section 3 shows that Botne and Davis's account and all other previous accounts of language games, especially McCarthy's template-insertion model (1982), fall short of accounting for this language game. Section 4 introduces the notion of templatic imposition to handle this language game showing how the model functions and providing evidence from a second language game in Arabic. Similarities and difference between the segment imposition and the templatic imposition accounts are also discussed. Section 5 reanalyzes Botne and Davis's treatment of segment imposition games as cases of templatic imposition. Section 6 provides a summary of the major arguments and provides some concluding remarks and recommendations.

2. Bird Language

2.1 *Data collection*

I was able to find four people who could speak BL[viii]. Two of them finished high school, one has an undergraduate degree in Accounting, and the fourth only finished ninth grade. I met with each of them separately and asked them to use BL to read a text written in Modern Standard Arabic (MSA). Their answers were recorded. Further discussions in spoken Jordanian Arabic (JA) were recorded and analyzed. The meetings were informal and involved asking specific questions pertaining to different aspects of syllables structure in MSA and JA.

2.2. *Data Analysis*

The subjects' answers were phonemically transcribed and the syllable structure of the original text was compared to the syllable structure used by the subjects. A clear pattern was found to be used by all subjects without exception and regardless of the variety of Arabic spoken. This paper is intended to lay out the general rules operating in this language game. This is achieved by a simple analysis of selected examples without complex application of any particular theoretical framework.

2.3. *The Game*

This language game is based on doubling the number of syllables in every word of the original sentence. This is achieved through a systematic addition of the voiced alveolar fricative /z/[ix] to every syllable making this game highly disguised. The added segment /z/ becomes the onset of every other syllable in the game. These syllables must be or become heavy (except phrase finally); a fact that will be used as evidence supporting the observation that this language game opts for consonant spreading rather than vowel spreading. Every word must start with a light syllable after which /z/ is added as the onset of a heavy syllable, which is in turn followed by another light syllable and then a heavy syllable with /z/ as the onset and so on. Then, the syllables of any word follow a strict rule of a light syllable followed by a heavy syllable except

phrase finally where light syllables headed by /z/ are allowed. Heavy syllables in the language are syllables with a long vowel. CVC syllables are also heavy except phrase finally. For an overview of syllable structure in JA, refer to Alghazo (1987) and Abu-Abbas (2003). Following are a few examples from Arabic in simplified phonemic transcription:

(14) BL in Arabic

	Arabic	BL	Gloss
a-	ʔa.ka.la	ʔa.zak.ka.zal.la.za	'he ate'
b-	qaa.la	qa.zaa.la.za	'he said'
c-	mak.ta.bon	ma.zak.ta.zab.bo.zon	'an office'
d-	saam.mon	sa.zaam.mo.zon	'poisonous'
e-	ʔin.ti.maa.ʔo.na	ʔi.zin.ti.zim.ma.zaa.ʔo.zon.na.za	'our belonging'

The rules of this game remain the same regardless of the variety of Arabic being used. Differences, other than lexical and syntactic, between JA and MSA relate basically to constraints on initial consonant clusters in MSA. A detailed account of the phonological implications the game provides about JA is beyond the scope of this study. Data from both JA and MSA are used in this paper.

2.4. *Lexical ambiguity in the game*

In this game, there is no distinction between some words, creating cases of lexical ambiguity. There are minimal pairs in Arabic that differ in having a geminated vs. a single consonant since geminates are phonemic in MSA, JA, and virtually all Arabic dialects. We saw above that this game uses gemination in some cases to create heavy syllables. Minimal pairs in Arabic involving single consonants and geminates are introduced in (15):

(15) Minimal pairs in Arabic

a.	/ka.tab/	vs.	/kat. tab/	'he wrote'	vs.	'he caused to write'
b.	/wa.lad/	vs.	/wal.lad/	'a boy'	vs.	'he gave birth to'
c.	/da.ras/	v.	/dar.ras/	'he studied'	vs.	'he taught'

According to the rules of BL, each pair of words in this game will have the structure in (16) respectively:

(16) Lexical ambiguity in BL

a. /ka. zat.ta.zab/
b. /wa.zal.la.zad/
c. /da.zar.ra.zas/

The first word in the pair requires a spreading of the first consonant of the second syllable to satisfy the second mora of the imposed template. In the second word, however, this mora is already satisfied by the coda of the first syllable. There are many such minimal pairs in Arabic.

3. Previous accounts

The traditional analysis of such language games would suggest an insertion of /z/ after the first mora of each syllable. Further phonological rules will have to be postulated to account for the lengthening of some vowels as in (14b) and (14d), while another rule will be needed to account for the gemination of some consonants as in (14a) and (14c). These two rules would be necessary in this game since they create heavy syllables when needed. Furthermore, there will be a need for a schema that would trigger vowel lengthening in some cases and gemination in others. Neither McCarthy's template insertion and autosegmental vowel spreading (1982), nor Bagemihl's rule driven CV-insertion and autosegmental spreading (1987) accounts for the gemination in (14a,c).

Following Botne and Davis's analysis of imposition-type games will not account for the game under investigation. Proposing to impose the consonant /z/ on every vocalic gesture cannot account for the gemination that takes place in the language game. According to Botne and Davis's analysis of imposition-type games, the data in (14) above would have surfaced as in (17):

(17) BL under Botne and Davis's analysis, where syllables that should be geminated are underlined:

	Arabic	BL	Gloss
a-	ʔa.ka.la	*ʔa.za.ka.za.la.za	'he ate'
b-	qaa.la	qa.zaa.la.za	'he said'
c-	mak.ta.bon	* ma.zak.ta.za.bo.zon	'an office'
d-	saam.mon	sa.zaam.mo.zon	'poisonous'
e-	ʔin.ti.maa.ʔo.na	*ʔi.zin.ti.zi.ma.zaa.ʔo.zo.na.za	'our belonging'

This analysis accounts for (17b) and (17d) since in both, the original word includes a long vowel in the first syllable which is necessary for the creation a heavy syllable after z- imposition, as shown in (18).

(18) z-imposition in Arabic

Word	Demi-syllables	z-imposition
qaa.la	qa aa la a	qazaalaza

The imposition of /z/ on the first mora of the initial syllable leaves two moras represented by the long vowel /aa/ after /z/. This creates a heavy syllable headed by /z/. The second syllable headed by /z/ does not need to be heavy since it is final in the word. However, the above analysis does

not account for the rest of the data. Following Botne and Davis's segment imposition analysis, deriving */ʔa.za.ka.za.la.za/ from /ʔa.ka.la/ would have proceeded as in (19) below.

(19) */ʔa.za.ka.za.la.za/ from /ʔa.ka.la/

Word	Demi-syllables	z-imposition
ʔakala	ʔa a ka a la a	*ʔazakazalaza

This proves that segment imposition falls short of accounting for the facts presented by this language game. Although the number of syllables does double, syllables headed by the imposed /z/ are not heavy. These syllables may be rendered heavy either by lengthening the vowel in each syllable or by closing it with a consonant. The game under investigation opts for the second solution, creating two geminates in the word /ʔa.zak.ka.zal.la.za/.

Accordingly, neither insertion of a template nor imposition of a segment accounts for the facts presented by this language game. The following section introduces templatic imposition to account for the language game under investigation.

4. Templatic imposition

To avoid the problems discussed above, I will follow Botne and Davis (2000) in their analysis of imposition-type games, but depart from their analysis in suggesting that instead of imposing a consonant on the vocalic gesture, BL involves an imposition of a bimoraic template on the first mora of each syllable. This bimoraic template has /z/ as its onset. This consonant is followed by two unspecified moras. Then the first step would be splitting the first mora of each syllable into two and then imposing our bimoraic template. The two moras of the imposed syllable must be phonetically realized except phrase finally. The first mora is automatically satisfied as a result of the imposition process. If the second mora is not satisfied, the onset of the following syllable spreads and fills this empty mora creating a geminate.

4.1 *Application of the game*:

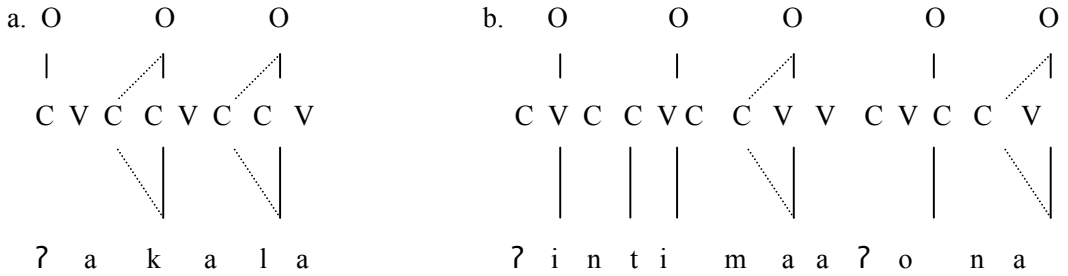
Application of this game involves a complex mapping of a bimoraic template headed by /z/ to a necessarily heavy syllable. This implies that the first step in the application of this game is preparation of the input so that each word is strictly made up of heavy syllables. If this scenario is not readily available in the input, i.e. in the presence of CV syllables, the Onset (O) of a following syllable is pulled so that it becomes coda of the preceding light syllable. This does not happen if the CV syllables in word final since there is no following consonant to pull. This is exemplified in (20) for data in (14):

(20) Application of BL: step one

a-	ʔa.ka.la	⟶	ʔak	kal	la	
b-	qaa.la	⟶	qaa	la		
c-	mak.ta.bon	⟶	mak	tab	bon	
d-	saam.mon	⟶	saam	mon		
e-	ʔin.ti.maa.ʔo.na	⟶	ʔin	tim	maa	ʔon na

Crucial to the creation of heavy syllables in this game are onsets preceded by light syllables. Thus, the argument is that the creation of heavy syllables starts by seeking the onset of each syllable in the original word. If an onset is preceded by a CV syllable, that onset spreads regressively and becomes coda of the light syllable creating a heavy syllable, as shown in (21a, b) for /ʔa.ka.la/ and /ʔin.ti.maa.ʔo.na / respectively:

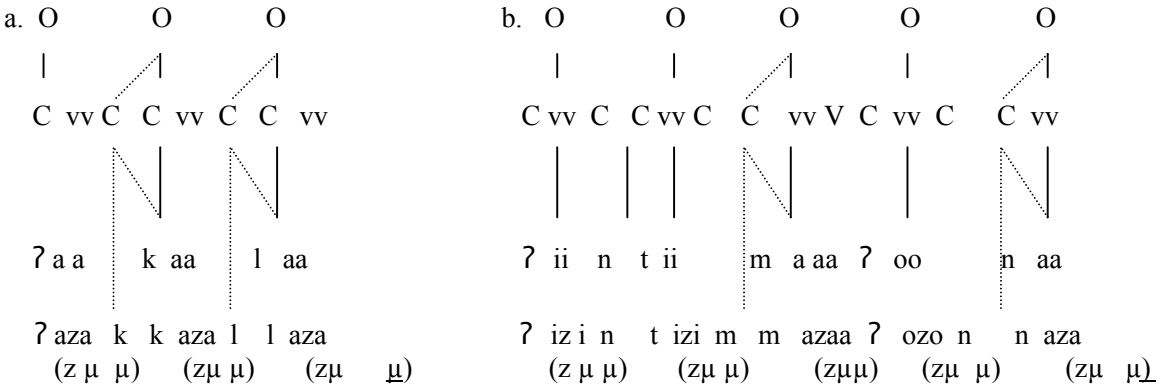
(21) Creating heavy syllables:



Before the bimoraic template is imposed, the first mora of each syllable must be split into two demi-syllables. The onset of the imposed bimoraic template, i.e. /z/ is now onset to every heavy syllable in the word except in final position where syllables headed by /z/ may be light.

Then the first mora of the template is automatically satisfied by the imposition process since /z/ is necessarily followed by the second part of the vowel previously split by the process (the split vowel is written in lower case letters). The second mora is satisfied either by the presence of a long monophthong or a diphthong in the original word, i.e. a CVV syllable, or when the original syllable is closed by a coda consonant, i.e. CVC. If the original syllable is open with a short vowel, i.e. CV, the second mora of the imposed template is satisfied by the spreading of the onset from a following syllable unless the CV syllable is word final in which case the second mora is left empty. This is shown in (22), where the empty moras are underlined:

(22) Imposition of the bimoraic template:



To recap, CV syllables in BL require spreading of a following onset creating cases of gemination as shown in (23):

(23) CV syllables

Word	Demi-syllables	zμμ-imposition
ʔakala	ʔa a ka a la a	ʔazaμ kazaμ lazaμ

After the imposition of the bimoraic template, the second and fourth syllables have unrealized moras. These are filled by a spreading process of the following consonant, producing the desired output /ʔa.zak.ka.zal.la.za/. The second mora of the final syllable cannot be filled by the spreading process from a following consonant because no such consonant exists. The second mora is thus left empty.
On the other hand, CVV syllables do not require consonant spreading since the second mora of the imposed template is satisfied by the long vowel, as exemplified in (24):

(24) CVV syllables

Word	Demi-syllables	zμμ-imposition
naam	n aa a m	nazaam

The spreading rule is not needed since the imposition of the bimoraic template takes place on the first mora and thus splitting the first syllable into /na/ and /aa/. The two moras of the imposed template are filled by the two vowels, producing /na/ and /zaa/.
Consonant spreading is also inactive in the presence of closed syllables. If a word has a closed syllable like /bad.la/ meaning (a suit), the second mora of the imposed template is satisfied by the coda consonant of the first syllable. The resulting word would thus be /ba.zad.la.za/ as shown in (25).

(25) CVC syllables

Word	Demi-syllables	zμμ-imposition
badla	ba ad la a	bazadlazaμ

More complex syllables are unproblematic as well. CVCC syllables satisfy the bimoraic template straightforwardly, as shown in (26) for /bard/ meaning 'cold'.

(26) CVCC syllables

Word	Demi-syllables	zμμ-imposition
bard	baard	bazard

4.2 *The Meccan language game*

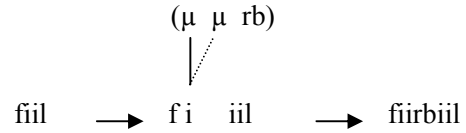
Imposition of a bimoraic template is thus imperative for a proper analysis of the language game under investigation. Satisfaction of the second mora by consonant spreading is typologically balanced by vowel spreading in the Meccan language game introduced earlier in (9) and repeated in (27) for convenience. This language game is of interest since it also balances the type of template being imposed. In BL, a bimoraic template headed by /z/, i.e. (zμμ) is imposed on every vowel, while in the Meccan game; a bimoraic template closed by /rb/, i.e. (μμrb) is imposed on the vowel of the stressed syllable in each word.

(27) Meccan Arabic

a.	fiil	fiirbiil	'elephant'
	fuul	fuurbuul	'beans'
	gaal	gaarbaal	'he said'
b.	aħmad	aarbaħmad	'Ahmad'
	qurʔaan	qurʔaarbaan	'Koran'
	hina	hiirbina	'here'
c.	aħtaram	aħtaarbaram	'he respected'
	altagaah	altagaarbaah	'he found it'
	gaabalu	gaarbaabalu	'he met him'

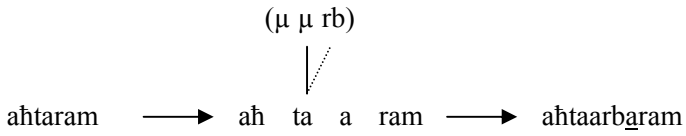
In (27a), the bimoraic template (μμrb) is imposed on the first mora of the stressed vowel creating two demi-syllables which are /fi iil/, /fu uul/ and /ga aal/ respectively. The second mora is subsequently satisfied by autosegmental vowel spreading. The imposition of the template is exemplified in (28) for /fiil/:

(28) μμrb-imposition: /fiil/



This example may have been analyzed without reference to spreading by claiming that the template is imposed on the second mora. This argument is countered by the fact that the second syllable in /fiirbiil/, and all similar examples, remains long. Had imposition taken place on the second mora, the word would have surfaced as /fiirbil/. Furthermore, a form like /aħtaram/, where the underlined stressed syllable has a short vowel, i.e. a single mora, is rendered /aħtaarbaram/ in the language game further supports the analysis that the imposition takes place on the first mora with vowel spreading satisfying the second mora as shown in (29):

(29) μμrb-imposition: aħtaram



4.2 *Template-insertion, segment imposition, and templatic imposition*

McCarthy's (1982) template-insertion approach falls short of accounting for the two language games discussed in this paper. As discussed in Botne and Davis (2000), the template-insertion approach has several shortcomings. Most importantly, the template-insertion approach does not justify the structure of the template; a CV-template used to account for a particular language game can be viewed as a VC-template producing the same desired outputs.

Analysis of BL as a game involving the insertion of a CVV-template accompanied by vowel spreading fails, since the game does not involve vowel spreading to start with. The second mora of the template is sometimes filled by an existing vocalic gesture or otherwise, by the spreading of a following consonant. It is this feature BL that distinguishes it from all other language games; a feature that calls for an approach that combines the notions of imposition and the template at the same time.

The Meccan game is also problematic for the template-insertion approach. These problems are of tow types. First, the structure of the inserted template and second the location of insertion. There are three possible structures of the template, namely, VrbV, VVrb, and rbVV. The location of insertion may be after or before the stressed vowel with autosegmental spreading working in various directions, or the insertion is after the first mora of the stressed vowel with autosegmental spreading doing the rest of the job. A detailed analysis of all these details requires a separate investigation especially that a second language game introduced earlier in (10) uses the same consonants but with prespecified vowels, and field work by the researcher will show

that there is yet a third language game in Arabic that uses the same consonants with the vowels behaving in a rather different manner compared to the other two –rb- language games.

Since the templatic imposition approach introduced in this paper basically involves a process of imposition, it is in conformity with Botne and Davis's criteria for segment imposition (pp. 328-9). The major difference between the two accounts is the fact that with gestural imposition, autosegmental spreading is rendered obsolete while under the templatic imposition approach, spreading is necessary to account for the germination process that takes place when CV-syllables are involved.

5. Botne and Davis's analysis revisited

With templatic imposition in hand, Botne and Davis's segment imposition approach may be reanalyzed as an imposition of a monomoraic template on the vocalic gesture. The empty mora is automatically satisfied by the imposition process. A list of imposition-type games is provided in Botne and Davis (2000: 339) from which we reanalyze a Hungarian and a Spanish language game in (30) and (31) respectively, as involving the imposition of a monomoraic template.

(30) Hungarian

Word	Demi-syllables	vμ-imposition
soha	so o ha a	ovohava

(31) Spanish[x]

Word	Demi-syllables	fμ-imposition
grande	gra a nde e	grafandefe

6. Conclusion

The major objective of this paper has been to support the notion of imposition-type language games proposed by Botne and Davis (2000). Evidence from a language game in Jordanian Arabic calls for replacing Botne and Davis's segment-imposition with templatic imposition and retaining autosegmental spreading which was rendered obsolete in Botne and Davis's model. Segment imposition is thus reanalyzed as an imposition of a monomoraic template. Facts from a language game in Meccan Arabic provide further typological evidence in favor of the proposal argued for in the paper. Implications, ramifications, and applications of the proposed model will require further investigations into various types of language games.

Endnotes

[1] In this game the final two syllables are permuted except for the prosodic features of length and tone. This language game is provided as evidence for an independent tonal tier. In the example cited, length is marked by doubling the vowel, acute and grave accents represent high and low pitch, and an acute-grave sequence indicates a falling contour (Kenstowicz and Kisseberth 1979: 167)

[2] For a typological survey of language games, refer to Pound (1963), Laycock (1972), Bagemihl (1988), and Davis (1993). Most examples used in this paper are cited in Botne and Davis (2000).

[3] The voiced and voiceless pharyngeal fricatives are symbolized by a /ʕ/ and /ħ/ respectively.

[4] Where /ʔ/ represents the voiceless glottal stop.

[5] The opaque stress in this word is not addressed by Bakalla. This pattern, I believe, is opaque since the initial vowel in the word is epenthetic and stress avoids stressing epenthetic vowels.

[6] For the advantages of demisyllables in the discussion of imposition-type games, refer to Botne and Davis (2000).

[7] The name is due to the nature of the consonant being used which is associated with the sounds of many birds. Other users of this language prefer to call it simply the z-language since some of the more proficient users of this language game can use any other consonant instead of /z/.

[8] This language game is used primarily by fishermen in the southern parts of Jordan.

[9] Beside the common use of bilabials in language games, the use of alveolar continuants comes next in frequency of use.

[10] Whether coda consonants are moraic or not is irrelevant and does not have an impact on the argument. This language game may as well be analyzed as involving an imposition of a bimoraic template the second mora being satisfied by the coda consonant. A closer inspection of the language game would be necessary to make a definite conclusion.

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