Arabic Extrametricality and Syllable Patterns *

PP Talk 26th September 2019

Emily Lindsay
emily.lindsay@ling-phil.ox.ac.uk
Faculty of Linguistics,
Philology and Phonetics

1 Background

1.1 CV vs VC vs C Dialects

Arabic dialects have been divided into groups based on where they insert an epenthetic vowel into a morphologically derived triconsonantal cluster, such as:

(1)   / qul-t-l-u/
        I/you (m.sg.) said to him

VC [gil**it**lu] (Iraqi)
CV [ʔul**ti**lu] (Cairene)
C [qəl**t**lu] (Moroccan)

1.2 Kiparsky 2003 Dialect Group Criteria

Kiparsky [2003] found other phonological behaviours were also associated with these dialect groups:

Table 1: Kiparsky 2003 Dialect Group Criteria

	CV	VC	C
-CC# CLUSTERS	✓	Not permitted or sonority restrictions	✓
#CC- CLUSTERS	X	initial vowel prosthesis	✓
INITIAL GEMINATE CLUSTERS	vowel prosthesis	✓	✓
METATHESIS	X	✓	drop vowel
POSTGEMINATE SYNCOPE	X	✓	✓
CLOSED SYLLABLE SHORTENING	✓	X	X
OPAQUE STRESS/EPENTHESIS INTERACTION	X	✓	X

1.3   Behaviour of Cv Dialects

[Watson, 2007] found a group of dialects including San'ani and Makkan that looked like CV dialects based on epenthetic position but shared properties of others groups:

CV Features Epenthesise after second element in cluster

VC Features Permit Medial CVVC Syllables
Permit Final CVCCC and CVVCC
Delete high vowels after geminates

C Features Permit initial consonant clusters
Permit medial -CCC- clusters

Watson designated these dialects as a fourth group, Cv.

Neither paper looks at stress patterns in depth, as Kiparsky found that stress did not fall on a consistent syllable position in his dialects.

However, if we look at the *parameters* underlying stress, a pattern does emerge.

2   Aims of This Talk

- Reanalyse dialects for extrametricality

- Demonstrate that extrametricality patterns with syllable typology

- Show flaws in existing syllable typology analyses

- Provide a new analysis to account for all the data

3   Stress Theoretical Background

What is stress?

"the means of marking relative prominence within various organisational groupings of metrical units"

Lahiri [2001]

Metrical Stress Theory

Quantity Sensitivity	Yes		No	
Foot Type	Syllabic Trochee	Moraic Trochee	Iamb	
Parsing Directionality	Left-to-Right		Right-to-Left	
End Rule	Left		Right	
Extrametricality	Yes		No	
Unit	Consonant	Mora	Syllable	Foot

Hayes [1995]

Hayes assumes a small asymmetric inventory of binary feet:

Syllabic Trochee	
(x .)	
σ σ	

Syllable Weight:

Light CV
Heavy CVC, CVV
Superheavy CVVC, CVCC

Moraic Trochee		Iamb	
(x .)		(. x)	(x)
L L		L H	H
(x)		(. x)	
H		L L	

4   Typology of Arabic Extrametricality

4.1   Previous Stress Analysis of Arabic Dialects

Stress for a range of Arabic dialects has been previously analysed as follows [1]:

Table 2: State of the Art: Stress Parameters Across Arabic Dialects

VARIETY	FTTYPE	DIR	END RULE	EXTRAMETRICALITY
CV				
Cairene	MT	L-R	right	Consonant
Najrani	MT	L-R	right	Consonant
VC				
Palestian	MT	L-R	right	Foot/Consonant
Damascene	MT	L-R	right	Syllable
Lebanese	MT	R-L		Syllable
Negev Bedouin	Iamb	L-R	right	Foot
Wadi Ramm Arabic	Iamb	L-R	Right	Foot
Bedouin Hijazi	MT	R-L		Syllable
Iraqi Hit	MT	L-R	right	Foot/Consonant
Cv				
Makkan	MT	L-R	right	Foot/Consonant
San'ani	MT	L-R	right	Foot/Consonant
C				
Oran Algerian	MT	L-R	right	None

There is no clear distribution of the extrametrical units: Levantine dialects receive syllable, foot, and foot & consonant extrametricality; and Gulf receive consonant, syllable and foot& consonant extrametricality.

---

[1]Note that the analyses for Bedouin Hijazi, Negev Bedouin, Palestinian, Cairene and Lebanese are taken from Hayes [1995]; the analysis for San'ani taken from Watson [2002]; the analysis for Iraqi Hit from Al Abdely [2011]; the analysis for Wadi Ramm Arabic from Al Mashaqba [2015]; the analysis for Oran Algerian from Bouhadiba [1988]; the analysis for Makkan Arabic from Kabrah [2010], the analysis for Najrani Arabic from Alfadly and Alhamami [2018]

4.2   New Metrical Stress Analyses

However, a coherent typological pattern emerges if we reanalyse some of these dialects and introduce some new analyses.

4.2.1   Palestinian and Iraqi Analysis

Hayes [1995] and Al Abdely [2011] argue for Foot and Consonant Extrametricality for Palestinian and Iraqi Hit respectively:

Figure 1: Palestinian and Iraqi Foot Extrametricality Analysis

Palestinian			Iraqi		
X			X		
(x	.)		(x.	.)	
ki	ta< b>		ka	ta< b>	
X			X		
(x)	<(x	.)>	(x)	<(x	.)>
mad	ra	sa	mad	ra	sa

The same effect can be made with syllable extrametricality, which prevents the final foot from being footed. In the case of a bisyllabic word, the residue is stressed:

Figure 2: Palestinian and Iraqi Syllable Extrametricality Analysis

Palestinian			Iraqi		
X			X		
ˈki	< tab>		ˈka	< tab>	
X			X		
(x)			(x)		
ˈmad	ra	< sa >	ˈmad	ra	< sa>

4.2.2   Wadi Ramm and Negev Bedouin Analysis

Al Mashaqba [2015] and Hayes [1995] argue that both Wadi Ramm and Negev Bedouin Arabic can be analysed with foot extrametricality. However, the same effect can be had with syllable extrametricality - an analysis not only with a smaller unit of extrametricality, but one with typological benefits.

Figure 3: Wadi Ramm and Negev Bedouin Foot Extrametricality Analysis

Wadi Ramm		Negev Bedouin		
X		X		
(x)	<(x)>	(x)		<(x)>
naa	gil	it	ti	fag

Figure 4: Wadi Ramm and Negev Bedouin Foot Extrametricality Analysis

Wadi Ramm		Negev Bedouin		
X		X		
(x)	<(x)>	(x)		<(x)>
naa	gil	it	ti	fag

In a bisyllabic LL or LH word, syllable extrametricality will not apply as both dialects are iambic so require stress on the final syllable.

4.2.3   Moroccan Analysis

Casablanca Moroccan Arabic can be analysed as moraic trochees built left-to-right with End Rule Right and no extrametricality based on data from Boudlal [2001]:

Moraic Trochee

```
    X
(x     .)
ˈʃmi    ʕa
```
a little candle

Left-to-Right

```
    X
(x     .)
ˈqDi   na   ha
```
big deal!

End Rule Right

```
          X
(x)   (x     .)
məz   ˈɣu   ba
```
wretched(f.)

No Extrametricality

```
              X
(x)     (x)
nəx    ˈdem
```
I work

The alternative parameter options predict stress in unattested locations:

*Iamb

```
        X
(.      x)
*ʃmi    ˈʕa
```
a little candle

*Right-to-Left

```
        X
(x     .)
*qDi   ˈna   ha
```
big deal!

*End Rule Left

```
 X
(x)     (x     .)
*ˈməz   ɣu   ba
```
wretched(f.)

*Extrametricality

```
 X
(x)       (x)
*ˈnəx   de<m>
```
I work

4.2.4   Tunisian Analysis

Tunisian Arabic can be analysed as moraic trochees built left-to-right with End Rule Right and consonant extrametricality based on data from Maamouri [1967]:

Moraic Trochee Left to Right

```
    X
(x     .)
ˈha   ra   ka
```
social or political movement

End Rule Right

```
             X
(x   .)   (x)
bu   da   ˈda:
```
tiresome people

Consonant Extrametricality

```
    X
(x)
ˈmsa:   mi< r >
```
nails

The alternative parameters predict incorrect stress assignment:

Moraic Trochee ***Right to Left**	***Iamb** **Left to Right**	***End Rule Left**

```
          X                          X                  X
     (x        .)              (.        x)         (x    .)   (x)
*ha  'ra       ka          *ha  'ra       ka        *'bu  da   da:
social or political movement   social or political movement   tiresome people
```

*Iamb **Right to Left**	*** Syllable** **Extrametricality**	***No Extrametricality**

```
              X                    X                            X
    (.        x)           (x     .)   < (x) >          (x)      (x)
*ha  ra       'ka          *'bu  da     da:             *msa:    'mir
social or political movement    tiresome people                 nails
```

4.2.5 Qatari Analysis

Qatari Arabic can be analysed as moraic trochees built left-to-right with End Rule Right and consonant extrametricality based on data from Al-Sulaiti [1993]:

Moraic Trochee	**End Rule Right**	**Consonant** **Extrametricality**	**Left-to-Right**

```
                          X                                          X
X                      (x)   (x)                  X               (x    .)
(x     .)              maʃ  'hu:  ra           (x)   (x    .)     'ma  θa  la< n >
'ʃa  ra <t>            popular(f.s.)           zaT  'Ti  hu< m >    for example
she bought                                     you devoured them
```

The alternative parameters predict incorrect stress assignment:

*Iamb	***End Rule Left**	***Syllable** **Extrametricality**	***Right-to-Left**

```
                           X                                              X
        X               (x)   (x)                 X                   (x      .)
(.      s)              'maʃ  hu:  ra           (x)         <>        *ma  'θa  la< n >
*ʃa  'ra <t>            popular(f.s.)           *'zaT  Ti  hum         for example
she bought                                      you devoured them
```

4.3 New Distribution of Extrametrical Units

The analyses motivated above produce a distribution of extrametrical units that shows geographical patterns:

Table 3: New Typological Distribution Metrical Stress Parameters

Variety	FtType	Dir	End Rule	Extrametricality
CV				
Cairene	MT	L-R	Right	Consonant
Najrani	MT	L-R	Right	Consonant
Qatari	MT	L-R	Right	Consonant
VC				
Palestinian	MT	L-R	Right	Syllable
Damascene	MT	L-R	Right	Syllable
Lebanese	MT	R-L		Syllable
Negev Bedouin	Iamb	L-R	Right	Syllable
Wadi Ramm	Iamb	L-R	Right	Syllable
Bedouin Hijazi	MT	R-L		Syllable
Iraqi Hit	MT	L-R	Right	Syllable
Cv				
Makkan	MT	L-R	Right	Foot/Consonant
San'ani	MT	L-R	Right	Foot/Consonant
C				
Moroccan Casablanca	MT	L-R	Right	None
Oran Algerian	MT	L-R	Right	None
Tunisian	MT	L-R	Right	Consonant

5   Existing Solutions

5.1   Kiparsky 2003

Kiparsky argued that the distinction between dialects was due to semisyllable licensing. In his analysis, semisyllables are unsyllabified mora that attached directly to the prosodic word node.

Table 4: Kiparsky 2003 Analysis

Dialect Group	Lexical	Postlexical
CV	X	X
VC	✓	X
C	✓	✓

5.2   Watson 2007

Watson [2007] extended this analysis to account for both Cv dialects, and variable permissibility of CVVC and CVCC syllables. She uses mora sharing as an added dimension of variation between the groups:

Table 5: Watson 2007 Analysis

Dialect Group	Lexical	Postlexical	Mora Sharing
CV	X	X	Word-final CVVC syllables
VC	✓	X	CVVC syllables
Cv	X	X	CVVC or CVCC syllable
C	✓	✓	none

5.3 Problems

The key issue with both of these analyses is how they account for CV dialect behaviour. They argue that CV dialects do not permit semisyllables, and only share mora for word-final CVVC syllables.

However, this cannot account for the permissibility of final -CC# clusters, such as in Cairene:

(2)   kata**bt**

This is not an exception.

'Only CV and C dialects allow final -CC clusters unrestrictedly'

Watson 2007, p. 339

The final element of such a cluster is described as a 'non-moraic consonant' by Watson [2007, p. 345], but its distribution and behaviours are not accounted for.

6   New Solution

6.1   Semisyllable Typology

I propose there are two types of semisyllables, one moraic and the other not[2]:

Figure 5: Moraic Semisyllable

$$
\begin{array}{c}
\varsigma \\
| \\
\mu \\
| \\
C
\end{array}
$$

Figure 6: Mora-less Semisyllable

$$
\begin{array}{c}
\varsigma \\
| \\
C
\end{array}
$$

Dialects can vary in terms of which semisyllable they use, whether it is permitted word-initially, -medially, or -finally, and whether restrictions are put on any of these positions.

---

[2]Note that the use of ς to denote semisyllable follows Cho and King [2003]

Figure 7: Semisyllable Licensing by Dialect Groups

| Dialect Group	Semisyllable Type	Position		
		Initial	Medial	Final
CV	Mora-less	X	X	✓
VC	Moraic	X	✓	X or SCL-SEMI
Cv	Mora-less	(✓)	✓	✓
C	Moraic	✓	✓	✓

For sonority restrictions in VC -CC#, I use the Semisyllable Contact Law proposed by [Alhammad, 2018], to use the insights of the Sonority Sequencing Principle across the syllable boundary:

SCL-SEMI Sonority must fall between a syllable coda and the following semi-syllable onset (Alhammad 2018)
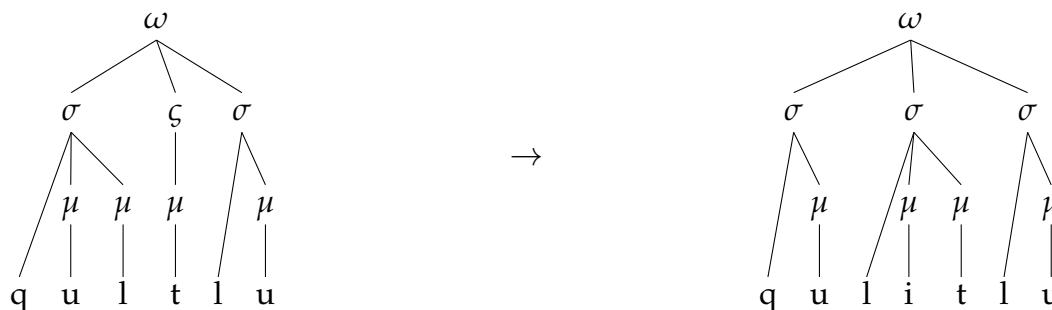
6.2 Motivating Semisyllable Type: CV and VC Dialects

We can motivate the semisyllable types for different groups using evidence from epenthesis position.

For CV and Cv dialects, it must be mora-less to be syllabified as an onset following epenthesis:
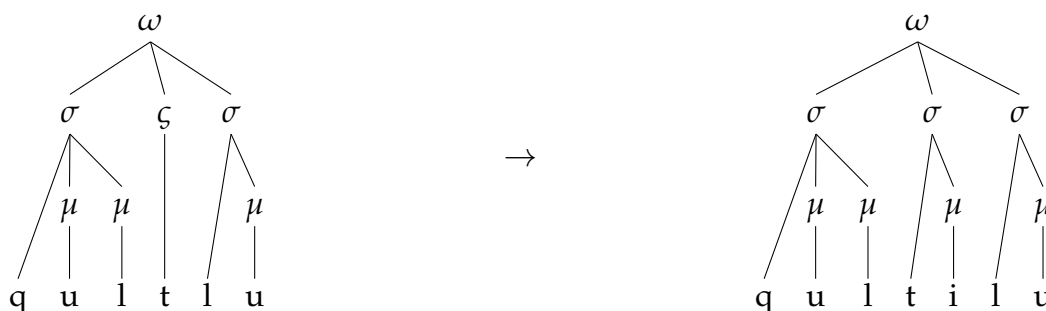

However, for VC dialects, the mora of the semisyllable must be preserved, so is syllabified as a coda instead:

For C dialects, that do not epenthesise in a -CCC- cluster, a different approach is needed. The following examples do not display vowel lengthening. The only way for these to be considered bimoraic, which is a constraint on all Arabic words, is for the initial segment to be a moraic semisyllable.

(3)   a.   ɣda
           'lunch'
      b.   ʃta
           'rain'
      c.   mRa
           'woman

Figure 8: Moroccan Moraic Onset Clusters

$$\omega$$

,
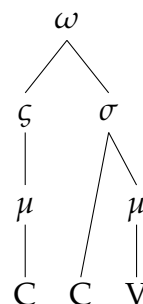
6.3   Motivating Semisyllable Position

Semisyllable position can be inferred from the criteria that Kiparsky found for each dialect:

Table 6: Inferring Semisyllable Position

	CV	VC	C
Initial			
#CC- CLUSTERS	X	X	✓
#GG- CLUSTERS	X	X	✓
Medial			
METATHESIS	X	✓	X
POSTGEMINATE SYNCOPE	X	✓	✓
-CVVC-	X	✓	✓
Final			
-CC# CLUSTERS	✓	X / sonority restrictions	✓

6.4   Canonical Space

This approach can also account for non-canonical behaviours more flexibly than previous proposals. Palestinian Arabic displays non-canonical VC behaviour, such as permitting initial consonant clusters:

(4)   a.   ʔik.laab
           'dogs', Iraqi
      b.   k.laab
           'dogs', Palestinian

This cannot be accounted for by Kiparsky - who argues that the semisyllable would not be permitted - or Watson, as there is no mora in the onset of [laab] to share with [k].

However, this approach can recognise the behaviour of Palestinian Arabic without compromising the canonical analysis:

Table 7: Canonical versus Non-Canonical VC Dialects

Dialect Group	Semisyllable Type	Position		
		Initial	Medial	Final
VC Canonical	Moraic	X	✓	X
Palestinian	Moraic	✓	✓	X

7 Conclusion

7.1 Summary

In this talk I have:

- Provided new analysis of extrametricality for 7 dialects

- Demonstrated that extrametricality must form part of the syllable typology

- Motivated a new analysis of syllable typology that accounts for all the dialects regardless of semisyllable moraicity and fully integrates epenthetic behaviour into the theory

Thanks for listening

References

A. A. Al Abdely. Stress Patterns in an Iraqi Arabic Variant: A Metrical Approach. *Journal of Anbar University for Languages & Literature*, 2:379–402, 2011.

B. M. Al Mashaqba. *The Phonology and Morphology of Wadi Ramm Arabic*. DPhil, University of Salford, 2015.

L. M. Al-Sulaiti. *Some Aspects of Qatari Arabic Phonology and Morphology*. PhD, University of Lancaster, 1993.

H. O. Alfadly and A. Alhamami. The Stress Assignment in Najrani Arabic : An OT Perspective. *International Journal of Science and Research*, 7(2), 2018.

R. Alhammad. *The Role of the Syllable Contact Law-Semisyllable (SCL-SEMI) in the Coda Clusters of Najdi Arabic and Other Languages*. Ph.D., The University of Wisconsin - Milwaukee, United States – Wisconsin, 2018.

A. Boudlal. *Constraint Interaction in the Phonology and Morphology of Casablanca Moroccan Arabic*. Ph.D. Thesis, Université Mohammed V, Rabat, Mar. 2001.

F. A. Bouhadiba. *Aspects of Algerian Arabic Verb Phonology and Morphlogy*. PhD, University of Reading, 1988.

Y.-m. Y. Cho and T. H. King. Semisyllables and universal syllabification. In C. Fery and R. van de Vijver, editors, *The Syllable in Optimality Theory*. Cambridge University Press, Cambridge, 2003.

B. Hayes. *Metrical Stress Theory: Principles and Case Studies*. The University of Chicago Press, Ltd., London, 1995.

R. S. Kabrah. Stress Assignment in Makkan Arabic: A stratal-OT analysis. In S. Farwaneh and H. Ouali, editors, *Perspectives on Arabic Linguistics XXIV – XXV: Papers from the Annual Symposia on Arabic Linguistics*. John Benjamins Publishing Company, Texas, 2010.

P. Kiparsky. Syllables and moras in Arabic. In C. Fery and R. van de Vijver, editors, *The Syllable in Optimality Theory*, pages 147–182. Cambridge University Press, Cambridge, 2003.

A. Lahiri. Metrical Patterns. In E. König and M. Haspelmath, editors, *Language Typology and Langauge Universals*, pages 1347–1367. Mouton, Berlin, 2001.

M. Maamouri. *The Phonology of Tunisian Arabic*. Ph.D., Cornell University, United States – New York, 1967.

J. C. Watson. *The Phonology and Morphology of Arabic*. Oxford University Press, Oxford, 2002. ISBN 978-85-7811-079-6. doi: 10.1017/CBO9781107415324.004. Publication Title: The Phonology and Morphology of Arabic.

J. C. E. Watson. Syllabification Patterns in Arabic Dialects: Long Segments and Mora Sharing. *Phonology*, 24(2): 335–356, 2007. doi: 10.1017/S0952675707001224.