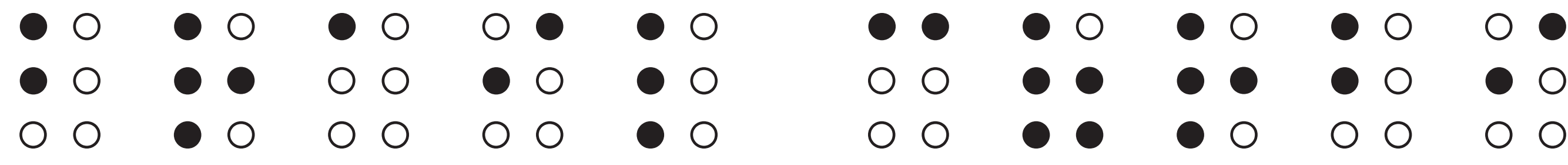




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Arabic Braille



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Is Arabic braille a writing system?

If we extend “reading” and “writing” to the sense of touch, then braille is a script, the graphs of which are **cells** (3×2 matrices of **raised dots**).

Using cells as graphemes of Arabic language makes out of Arabic braille a **writing system**.

Four layers of Arabic script

Among the four layers of standard Arabic script [Osborn 2017, 27] one vanishes and the others are represented by graphemes of similar size and shape :

<i>rasm</i>	قوته	} <table border="0"> <tr><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td></tr> <tr><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td></tr> <tr><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td></tr> <tr><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td><td>••</td></tr> </table>	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••	••
••	••		••	••	••	••	••	••	••	••																																
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<i>nuqta</i>	قوته																																									
<i>shaddah</i>	قوته																																									
<i>tasbkil</i>	قوته																																									

Notice that shaddah is placed *before* the base consonant.

Inheritance from English braille

ء	,	آ		أ	/	ؤ	\	إ	.
ئ	y	ا	a	ب	b	ة	ch	ت	t
ث	th	ج	j	ح	wh	خ	x	د	d
ذ	the	ر	r	ز	z	س	s	ش	sh
ص	&	ض	ed	ط)	ظ	for	ع	(
غ	gh	ف	f	ق	q	ك	k	ل	l
م	m	ن	n	ه	h	و	w	ى	o
ي	i	َ	,	ِ	e	ُ	u	ِ	;
ِ	in	ِ	en	ِ	(caps)	ِ	:	لا	v

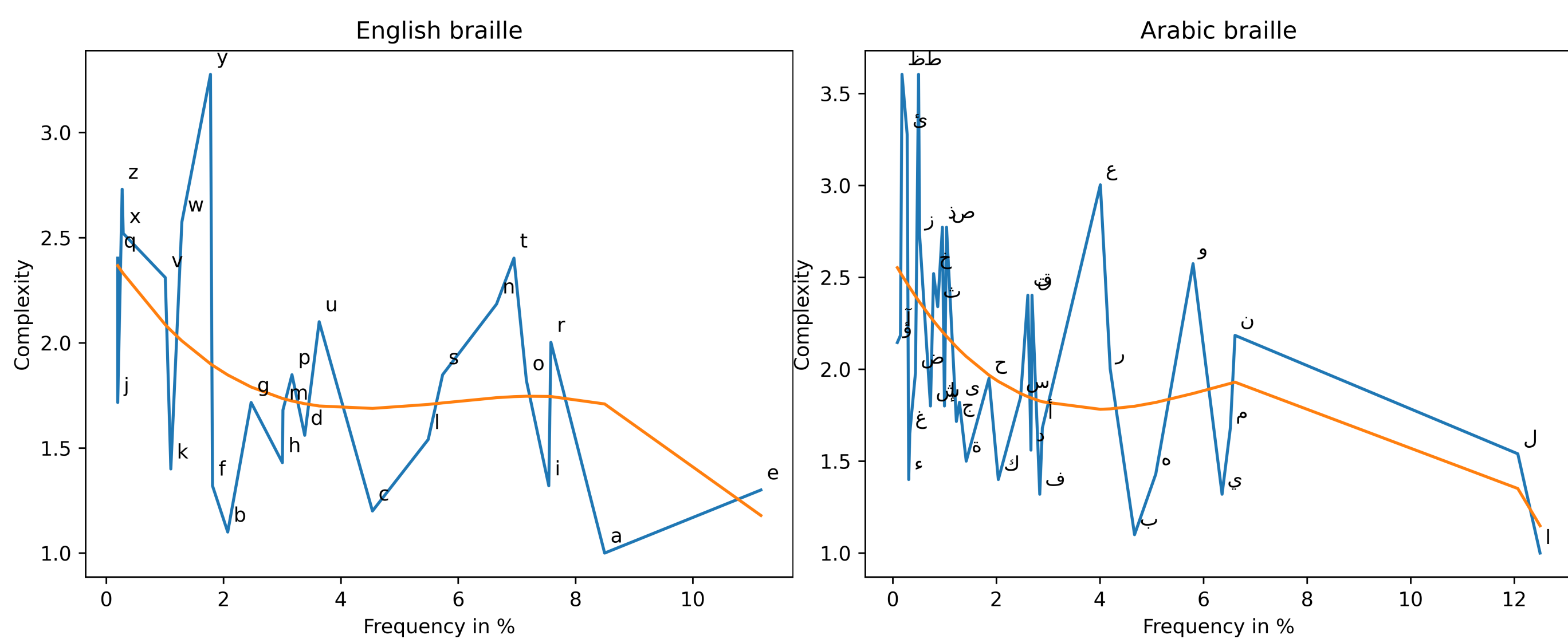
Hamza is often denoted by an apostrophe-like symbol and *ayn* by its mirror-image. خ could be represented by a ‘x’. *Soukoun* is denoted by ‘:’ in Hebrew (*shwa*) and لا visually resembles a ‘v’.

Complexity vs. grapheme frequency

To measure the complexity of braille cells we used the following multiplicative weights :

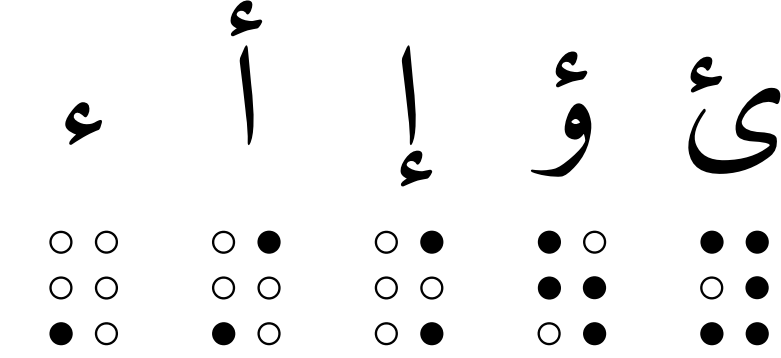
I	I.2
I.I	I.3
I.4	I.5

These weights correspond to the order points in cells are taught. We obtain the following results for English and Arabic :

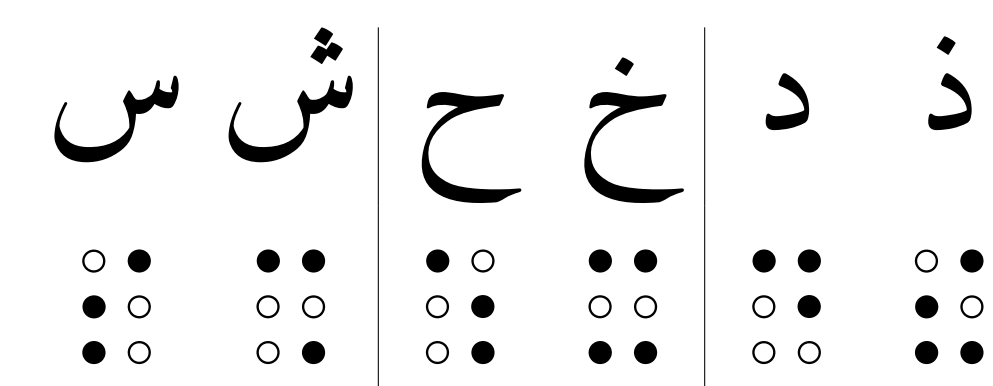


Linguistic properties on the graph level

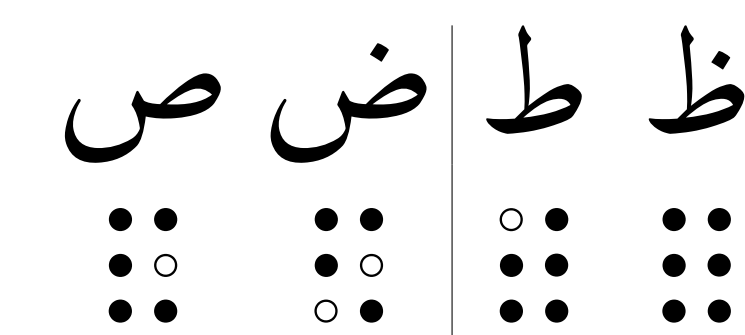
Hamza. Braille graphemes fail to represent the proximity of the various hamza forms (isolated and carried) :



Phonetic proximity. Braille graphemes fail to represent phonetic proximity that is visible in standard Arabic through the *rasm* level :



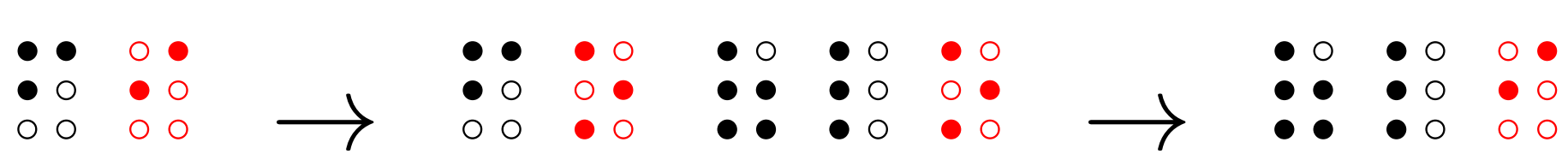
Emphasis. Nevertheless, braille graphemes achieve in representing the common emphatic property that is visible in standard Arabic through the *rasm* level :



Regional graphemic variations

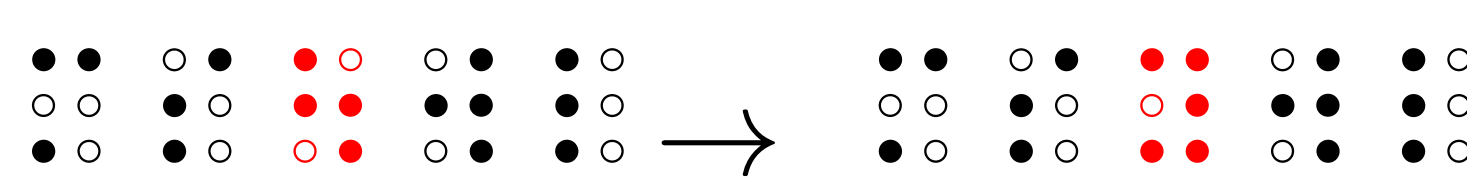
Egyptian *yā’/alif maqsura* inversion :

في → في علي → علي



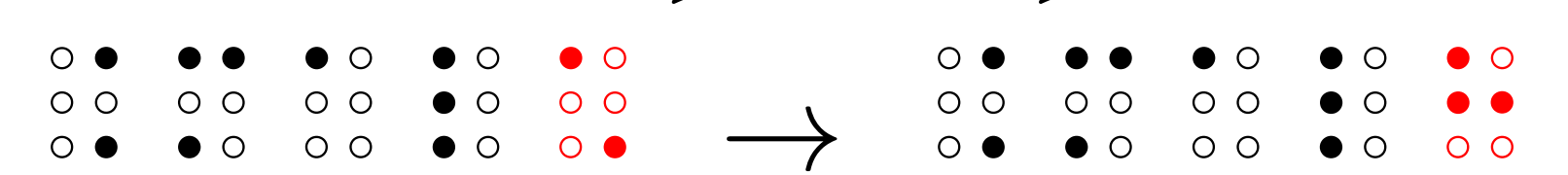
Disrespect of *hamza* rules :

مسؤول → مسؤول



Levantine *’imāle* : replacement of *tā’ marbuta* by an /e/ phoneme, written as *hā’* :

إمالة → إمالة



Conclusion

Exploring the braille adaptation of an abjad writing system, such as Arabic braille, may allow us to shed light on the nature of Arabic language, whether in oral, written or tactile modality.

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