Harmony and disharmony in Jewish Urmi

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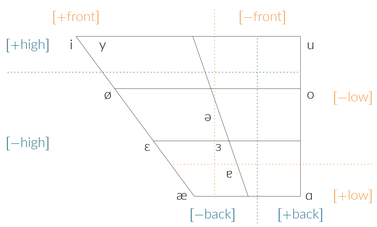
BACKGROUND



Jewish Urmi vowel inventory

Map of North-Eastern Neo-Aramaic languages
(adapted from Khan 2008: 4)

FRONTNESS HARMONY

(1) The harmonic feature is [±front] (Khaloo 2025: cf. Hoberman 1988, Khan 2008)

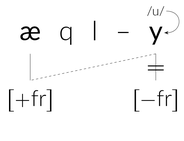
Contexts	Example stems	
All [+front]	[ø̟rt̟y̟g]	‘rug’
All [−front]	[o̠rdu̠]	‘army’
	[dæ̟rø̟lɛ̟]	‘to put’
	[bɐ̠to̠lɜ̠]	‘to stop working’

(2) Affix vowels alternate based on stem [±front] value

[+fr] ~ [−fr]	Examples of affix alternations		
[y̟] ~ [u̠]	[æ̟ql−y̟x]	~	[ɑ̠ql−u̠x]
	‘their foot’		‘their intelligence’
[ø̟] ~ [o̠]	[æ̟ql−ø̟x]	~	[ɑ̠ql−o̠x]
	‘your foot’		‘your intelligence’
[ɛ̟] ~ [ɜ̠]	[bɛ̟−æ̟ql]	~	[bɜ̠−ɑ̠ql]
	‘without (a) foot’		‘without intelligence’
[æ̟] ~ [ɐ̠]	[xæ̟−æ̟ql]	~	[xɐ̠−ɑ̠ql]
	‘(a) foot’		‘(an) intelligence’

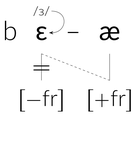
(3) Bidirectional spreading of [±front] from the stem displaces potentially conflicting affix vowel specifications

a. [+fr] spreads R to suffixes



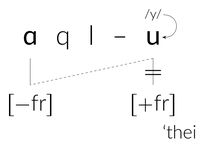
‘their foot’

c. [+fr] spreads L to prefixes



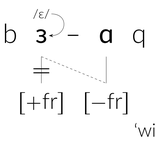
‘without (a) foot’

b. [−fr] spreads R to suffixes



‘their intelligence’

d. [−fr] spreads L to prefixes



‘without intelligence’

DISHARMONIC FORMS

(4) a. Disyllabic stems with /ɑ̠/

Contexts	Example stems	
Before [+front]	⟨*unattested*⟩	
After [+front]	[dy̟ʃmɑ̠n]	‘enemy’
Before [−front]	[qɑ̠ʃo̠q]	‘spoon’
After [−front]	[du̠mɑ̠n]	‘blizzard’

b. /ɑ̠/ is [−front] and opaque to harmony[1]

Stem	Affix harmony	
[dy̟ʃmɑ̠n] ‘enemy’	[dy̟ʃmɑ̠n−o̠x]	‘your enemy’
	[xæ̟−dy̟ʃmɑ̠n]	‘(an) enemy’

(5) a. Disyllabic stems with /i̟/[2]

Contexts	Example stems	
Before [+front]	[fi̟ty̟]	‘whistle (n.)’
After [+front]	[mæ̟tʃi̟t]	‘mosque’
Before [−front]	[si̟mɑ̠n]	‘congratulations (n.)’
After [−front]	[mo̠ri̟d]	‘follower’

b. /i̟/ is [+front], but transparent to harmony

Stems		Affix harmony	
[ti̟k]	‘piece’	[ti̟k−ø̟x]	‘your piece’
		[xæ̟−ti̟kɑ̠]	‘(a) piece’
[mo̠ri̟d]	‘follower’	[mo̠ri̟d−o̠x]	‘your follower’
		[xɐ̠−mo̠ri̟d]	‘(a) follower’

(6) a. Disyllabic stems with /ə̟/

Contexts	Example stems	
Before [+front]	[pəry̟g]	‘finish (n.)’
After [+front]	[mædʒlə̟s]	‘council, parliament’
Before [−front]	[ə̟ʃkɑ̠p]	‘cupboard’
After [−front]	[xo̠rə̟z]	‘rooster’

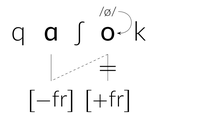
b. /ə̟/ is [+front], but transparent to harmony

Stems		Affix harmony	
[lə̟b:]	‘towel’	[lə̟b:−ø̟x]	‘your towel’
		[xæ̟−lə̟b:ɑ̠]	‘(a) towel’
[xo̠rə̟z]	‘rooster’	[xo̠rə̟z−o̠x]	‘your rooster’
		[xɐ̠−xo̠rə̟z]	‘(a) rooster’

OPACITY AND NON-DERIVED ENVIRONMENT BLOCKING

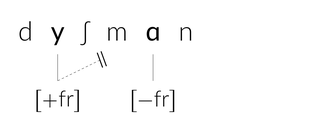
(7) Opaque (c) and NDE blocking (d) of spreading of [±front]

a. [−fr] spreads R from /ɑ/



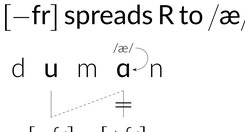
‘spoon’

c. [+fr] fails R spread to /ɑ/



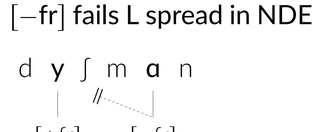
‘enemy’

b. [−fr] spreads R to /æ/→[ɑ]



‘rug’

d. [−fr] fails L spread in NDE

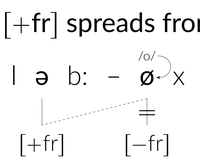


‘enemy’

TRANSPARENCY

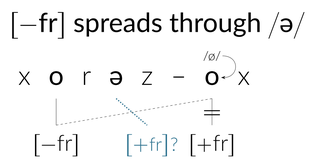
(8) Spreading from the stem, but no blocking

a. [+fr] spreads from /ə/



‘your towel’

b. [−fr] spreads through /ə/



‘your rooster’

COMPUTATIONAL ANALYSIS

(9) Boolean Monadic Recursive Schemes (BMRS; Chandlee & Jardine 2021)

a. Structure-sensitive tier projection (Mayer & Major 2018, De Santo & Graf 2019)

$$\mathcal{T}_{\mathtt{fr}}(x) := \begin{array}{l}\texttt{IF syll}(x)\ \texttt{THEN}\\ \quad\texttt{IF stem}_1(x)\ \texttt{THEN}\ \top\\ \quad\texttt{ELSE}\\ \quad\quad\texttt{IF}\ /\dot{\imath},\dot{\text{ə}}/(x)\ \texttt{THEN}\ \bot\\ \quad\quad\texttt{ELSE}\ \top\\ \texttt{ELSE}\ \bot\end{array}$$

transparency

if x is a vowel, then
  if x is also stem-initial, then x projects to $\mathcal{T}_{\mathtt{fr}}$;
  otherwise, (i.e. if x is a vowel but not also stem-initial)
    if x is /i̟, ə̟/, then x does not project to $\mathcal{T}_{\mathtt{fr}}$;
    otherwise, x projects to $\mathcal{T}_{\mathtt{fr}}$; (i.e. if x is a V other than /i̟, ə̟/)
otherwise, x does not project to $\mathcal{T}_{\mathtt{fr}}$ (i.e. if x is not a vowel)

b. Spreading and blocking on the projected tier (Nelson & Baković 2025)

$$\phi_{\mathtt{fr}}(x) := \begin{array}{l}\texttt{IF stem}_1(x)\ \texttt{THEN fr}(x)\\ \texttt{ELSE}\\ \quad\texttt{IF}\ \phi_{\mathtt{fr}}(p(x))\ \texttt{THEN}\\ \quad\quad\texttt{IF}\ /\text{ɑ}/(x)\ \texttt{THEN fr}(x)\\ \quad\quad\texttt{ELSE}\ \top\\ \quad\texttt{ELSE}\ \phi_{\mathtt{fr}}(s(x))\end{array}$$

opacity

if x is stem-initial, then x is faithful;
otherwise, (i.e. if x is not stem-initial)
  if x's predecessor is [+fr], then
    if x is also /ɑ̠/, then x is faithful;
    otherwise, x is also [+fr]; (i.e. if x is not also /ɑ̠/)
  otherwise, x agrees with its successor
    (i.e. if x is not stem-initial, nor /ɑ̠/, nor preceded by a [+fr] V)

Notes.
[1] Some “inherently emphatic [derivational] suffixes” with /ɑ̠/ (Hoberman 1988: 11–12) appear to at least be optionally harmonic, however: e.g. [nɣdʒy̟m−kɑ̠r] ~ [nɣ̟dʒy̟m−kæ̟r] ‘sorcerer’. Our analysis does not currently take this suffixal variation into account.
[2] Our analysis currently predicts that stem-initial /i̟, ə̟/ can only be disharmonically followed by /ɑ̠/, due to the opacity of the latter. However, there is at least one monosyllabic stem with /i̟/ that appears to systematically take [−fr] suffixes: e.g. [ti̟n−o̠x] ‘your clay’.

References cited. Chandlee, J. & A. Jardine. 2021. Computational universals in linguistic theory: Using recursive programs for phonological analysis. *Language* 97. • De Santo, A. & T. Graf. 2019. Structure sensitive tier projection: Applications and formal properties. *Formal Grammar* 2019. • Hoberman, R. D. 1988. Emphasis harmony in a modern Aramaic dialect. *Language* 64. • Khaloo, N. 2025. A (re)analysis of suprasegmental emphasis in Jewish Urmi. Ms., UCSD. • Khan, G. 2008. *The Jewish Neo-Aramaic dialect of Urmi*. Gorgias Press. • Mayer, C. & T. Major. 2018. A challenge for tier-based strict locality from Uyghur backness harmony. *Formal Grammar* 2018. • Nelson, S. & E. Baković. 2025. Feature spreading, redundancy, and blocking. Ms., UIUC and UCSD.